

Petrography and Bulk Chemistry of Coal Combustion By-products from Stoker Boilers: A Comparative Study Before and After Modification of an Ash Handling System

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Feed coal and coal combustion by-products (CCBs) were sampled from two stoker boilers before and after the ash handling system was modernized. The feed coal has not changed significantly in the five years between sampling events, providing a unique opportunity to examine the changing optical and chemical character of the ash in relation to system modification. Both boilers operate below their peak efficiency window and utilize the same feed coal. Prior to retrofit, emission controls on the systems consisted of multicyclone dust collectors, as well as a single baghouse. Following modernization, the boilers are operating somewhat closer to peak efficiency and have additional pollution controls, namely three diatomaceous-earth lined baghouses that together remove virtually all particulate matter from the combustion gas stream. CCB’s were sampled from multiple points, including bottom ash, sidestream ash, multicyclone ash, and, where present, baghouse ash. Bulk chemistry and optical petrography were completed on samples acquired following modernization and compared to pre-existing data. Changes are seen in ash size distributions and carbon contents, especially in the multicyclone and baghouse ashes, where fine carbons are prevalent.