

Long-term Monitoring and Evaluation of Water Quality Changes from Utilization of Coal-Ash to Fill a Surface Coal Mine

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KEYWORDS: surface mine, coal ash, water quality

ABSTRACT

Use of coal ash in filling of coal mines is receiving very high scrutiny both from environmental groups and from the U.S. Environmental Protection Agency. In its regulatory determination (May 22, 2000), U.S. EPA decided that the Agency will establish national regulations for coal combustion wastes. EPA specifically noted that it has considerable concern about certain current practices involving CCBs in mine filling, e.g., placement directly into groundwater.

This paper summarizes the groundwater and surface water monitoring results from the Universal ash site in Indiana where fly ash has been used to fill an open mine pit created by the surface mining of coal. Over 1.2 million tons of coal ash from a nearby power plant have been emplaced over a ten-year period beginning in 1989. Monitoring of groundwater and surface water for approximately 34 parameters has been performed quarterly for the past 10 years at several locations at the site. Data have also been collected on the bulk chemical composition and laboratory generated leachates for the CCBs on a quarterly basis. The coal ash is alkaline and has a pH of about 9.0.

Acid mine drainage (AMD) was present at the Universal ash site caused by the oxidation of pyrite in coal that was exposed to the atmosphere as a result of the mining operations. One of the monitoring locations at the Universal ash site is for the sampling and chemical analysis of water from mine seep located about 800 ft downgradient of the ash fill area. The monitoring data show significant improvements in the water quality which include near elimination of acidity; neutralization of pH; and reduction in iron, manganese, and sulfate concentrations. However these monitoring data also show an increase in boron concentrations in the mine seep water.