

POTENTIAL OF IMPOUNDED FINE COAL REFUSE SLURRY BREAKTHROUGHS INTO UNDERGROUND MINES¹

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Abstract: The Surface Mining Control and Reclamation Act authorizes the disposal of coal processing refuse in steep-sloped central Appalachia by constructing a coarse coal refuse embankment across a valley and then pumping fine coal refuse slurry into the basin. A concern shared by many engineers, geologists, and mine inspectors familiar with coal refuse slurry impoundments is related to the common occurrence of underground mine workings adjacent to or beneath the impoundments and the potential for slurry breakthroughs into mine works and subsequent breakouts into surface waterways. This concern was dramatized on October 11, 2000, when an estimated 306 million gallons of water and fine refuse slurry drained from an impoundment in Martin County, eastern Kentucky into an adjacent underground mine. Approximately 245 million gallons of the water and refuse slurry discharged from two underground mine portals and affected over 75 miles of streams in Kentucky and West Virginia. In response to this and several other similar events, the U.S. Office of Surface Mining Reclamation and Enforcement established a technical team to identify geotechnical issues that should be addressed in developing policies or guidelines to ensure that slurry impoundment designers and inspectors adequately evaluate breakthrough potential. Seven questions have been formulated and answered. Collectively, they pertain to two central considerations: (1) appropriate measures and available methods to identify and accurately locate underground mines proximate to the impoundments; and (2) the flowability of refuse slurry—not only in impoundments still receiving pumped slurry but also in “idle” and reclaimed facilities.

Additional Key Words: coal processing waste, coal refuse slurry dams, coal mine tailings.

¹ Paper was presented at the 2012 National Meeting of the American Society of Mining and Reclamation, Tupelo, MS *Sustainable Reclamation* June 8 – 15, 2012. R.I. Barnhisel (Ed.) Published by ASMR, 3134 Montavesta Rd., Lexington, KY 40502

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