Quantitative Evaluation of Flow Loss Restoration Associated with Undermined Streams at the Bailey Mine in Southwestern Pennsylvania¹

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<u>Abstract</u>: Since 2005, longwall coalmine operators in Pennsylvania (US) have been required to collect extensive biological and hydrologic data to document pre- and post-mining conditions of aquatic resources overlying the subsidence control plan areas (SCPA). Continued operation of the longwall mine depends on empirical data demonstrating that the undermined aquatic resources have either maintained or been restored to the normal range of pre-mining conditions. When subsidence-related flow loss is observed in streams overlying the SCPA, mine operators are required to implement restoration techniques aimed at restoring the flow condition. Streambed grouting is the primary flow loss restoration technique employed at the Bailey Mine. This presentation examines the comparative biological metrics and quantitative hydrologic methods that are used to determine recovery following intervention. The data show that streambed grouting is effective in protecting the overall hydrologic balance and maintaining the aquatic life use of streams within the Bailey Mine SCPA.³

Additional Key Words: Stream, Longwall, Flow Loss, Grouting, Restoration, Macroinvertebrates.

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^{3.} Work reported here was conducted near 39°53'27.87"N; 80°28'32.08"W.