**Uncertainty analysis of** **drainage flow modelling in goafing zone for underground mine development**

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# ABSTRACT

Modelling pore pressure changes and drainage flow through the fractured overburden above longwall panels is essential for subsidence assessment and dewatering planning in underground mine development. However, the fracturing and hydraulic features over the mining process are always unclear. This paper discusses uncertainties in the specification of hydraulic properties in the goafing zone above longwall panels within modelling of groundwater behaviour during longwall operation process. Parameter changes across the height above the panels and during mining stress periods were implemented within plausible ranges and constrained by parameter bounds from literature review. PEST-IES, an effective uncertainty analysis approach, was used to estimate the parameter distributions over both space (height) and time. Uncertainty analysis was empirically derived from quantification of the sensitivity of pore pressure and dewatering rate to parameter variations in the goafing zone. A detailed uncertainty and risk assessment was further conducted with an ensemble of model outcomes to assist the site operation and water management plan.