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Influence of Mine Drainage on Surrounding Groundwater Flow Field in Hilly Area, Case Study Huoqiu, China

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Abstract: Groundwater dependent ecosystems are much vulnerable, especially in hilly area. However, in order to ensure the safe operation of mining, plenty of mine drainage inevitably results in groundwater depth decreasing dramatically. The surrounding ecological environment may suffer a great destruction. In this paper, analysis of the underground mining effect on ecosystem is discussed in hilly area of Huoqiu, China. Based on the geological model and numerical simulation, groundwater level of the Quaternary aquifer is analyzed to determine whether the ecosystem will be affected. It is achieved that the area of accumulative groundwater drawdown above 5m is 183.5km2 after five years continuous mining, accounting for 13.87% of the study area. While at the end of ten years, the area is increased to 209km2. And it is mainly distributed between Madian town and Zhouyoufang town. In some area, there happens aquifer depletion and annual flow of surface water decreasing owing to the groundwater level decline. Finally, the distribution of vegetation undergoes great changes.
Key words: mine drainage; accumulative groundwater drawdown; numerical simulation; ecological environment