

A study on the effects of exposure of coal bed on the amount of mine drainages

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The amount of mine water flowing out of abandoned mines varies from mine to mine. In this study, the effect of coal bed exposed to surface and hydrogeological conditions on flowrates of coal mines was investigated by selecting coal mines with large and small amounts of mine water, respectively.

The development plan, water system, topography and geological conditions of each mine were analyzed. In particular, the surface exposure of coal bed, valley distribution, ground subsidence, and mining connectivity of rainfall and surface water were investigated through the documents, maps and field survey. Furthermore, we measured the flowrates of mine drainages from adits and investigated underground penetration of the water at the crossing points between valleys and coal beds.

In mine 1, there is an outcrop of coal bed at a higher level than a discharging point of the mine drainages, which crosses the valley. Therefore, it was found that the valley water is introduced underground through cracks around outcrop of the coal bed as a source of mine water.

In the case of mine 2, outcrop of coal bed existed at a higher level than mine drainages like mine 1, but there are no valleys. Therefore, it was implied that the increase of the amount of groundwater from precipitation was the primary source of mine water. It was concluded that the amount of mine drainage is highly dependent on the permeability coefficient in the watershed.

In the case of the mine with a large amount of mine water, it was concluded that the continuous increase in the amount of water from valleys through the cracks from mining is the main factor for the increase of the amount of mine water, as the coal bed was exposed to the valleys at higher level than mine drainages. The mine with a small amount of water shows no hydrogeological characteristics directly connecting surface water to the mine but is mainly dependent on the groundwater recharge from precipitation.