

Black-colored deep groundwater in the mudstone aquifer of Pohang area, Korea

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Pohang is one of the hot spring areas in the South Korea. Therefore, many deep wells for the spa have been developed, and not a small amounts of water supply has been pumped out from the wells for public bath. This became a cause of the drawdown of the groundwater level in the Pohang area. Recently, color of deep groundwater from a few of the wells in the Pohang area turned black. In this study, we will discuss about the cause of the black-colored water. The black-colored water is Na-Cl type and its water temperature, pH, EC and Eh are ~ 34 °C, 8.0 \sim 8.4, $\sim 7,500$ μ S/cm and ~ -270 mV, respectively. Ten years ago, the SO₄ content was more than 1,000 mg/L. At present, it is ~ 800 mg/L. The manganese content is more than 0.05 mg/L. Such geochemical characteristics suggest that the black color of the water might be derived by change of redox conditions in groundwater due to severe drawdown of groundwater level. Therefore, the black colored groundwater in the Pohang area indicates that an unplanned use and development of the groundwater due to human activity bring about severe drawdown of the groundwater level as well as the groundwater environment change in the aquifer.