

Abstract

The project area of analysis and evaluation of pumping test in consolidated aquifers can be found between 16° 23'–29' north latitude and between 102° 41'–51' east longitude in the western part of Khon Kaen town. Theis's, Cooper-Jacob's and recovery methods are applied for non-equilibrium pumping test with a pumping period of 240–960 minutes and the submersible or Jet pumping rates between 7.2–151.2 m³/d. The result showed that semiconsolidated sand and gravel gave highest yield with transmissivity (T) of 691.57 m²/d, while medium yield could be found in sandstone/siltstone aquifer with T 62.57 m²/d and rather low yield between T 10–40 m²/d could be observed in shale, shale/sandstone, and siltstone/sandstone with storage coefficients between 3.9236×10^{-4} and 3.5833×10^{-5} . The lowest yield could be found in sandstone aquifer with T of about 4.56 m²/d. In addition, a pumped well gave water quality for EC, total hardness, TDS and Cl between 220–1850 uS/cm., 73–1445 ppm, 264–1390 ppm, and 50–449 ppm respectively. However, pumping would affect the quality of groundwater discharge. An unusual significant change could be observed for EC, TDS, and HCO₃, while small changes of Cl, total hardness and Ca were determined. Furthermore, patterns of water quality fluctuation varied from well to well. The EC of many wells was found to increase gradually from the start of pumping until the end. In some wells, the EC only decreased at the rather end of the pumping period while in many others the EC as well as HCO₃ continuously decreased from the beginning to the end of pumping. In terms of transmissivity and quality, it could be finally concluded that the northeastern part of the study area gave a high yield and good quality of water. This is the same as the narrow path connecting the western part of Ban Gudnangthui, the southern part of Ban Laukwienhuk, the northern part of Ban Sa-ad, and the southwestern part of Khon Kaen town.