

Abstract

The aim of this study was to determine the hydraulic properties of Nairobi area in order to highlight the groundwater potential and to identify the distribution of hydraulic characteristics of aquifers in the area as well as to highlight vulnerability of the aquifer to heavy abstraction. Documented pumping tests data of boreholes located in Nairobi County were analyzed. Pumping test data from eighty four (84) single-well boreholes were analyzed in AQTESOLV software to determine transmissivity and storativity using Cooper-Jacob's, Theis's, Papadopulos-Cooper's and Theis's recovery methods. Hydraulic conductivity was calculated based on the relationship between hydraulic conductivity and transmissivity. The values of transmissivity for all wells ranged between 1.11 and 360.58 m²/d by using Theis -and Cooper-Jacob methods, 1.10 and 360.58 m²/d by Papadopulos-Cooper method and between 1.289 and 677.81 m²/d by Theis recovery method. The city of Nairobi faces increasing ground-water demand due to ever rising population which is mainly driven by rural-urban migration and industrial growth. Surface water has not only been over-stretched but also heavily polluted and unreliable thus groundwater is the only reliable alternative source of water in the area. Lava and pyroclastic formed during Cenozoic age make up the geology. Under these lavas and pyroclastic rocks lie schists of Precambrian age and gneisses of Mozambique belt of the same age. These results indicate that the aquifer is heterogeneous and that the groundwater supply for local water supply (small communities and plants) is reliable but withdrawal for great regional supply is limited.