

Simulation of Groundwater Movement for Nuclear Research Center at Al-Tuwaitha Area in Baghdad City, Iraq

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Abstract

The simulation of groundwater movement has been carried out by using MODFLOW model in order to show the impact of change of water surface elevation of the Tigris river on layers of the aquifer system for Nuclear Research Center at Al-Tuwaitha area, in addition to evaluate the ability of the proposed pumping well to collect groundwater and change the direction of flow at steady-state. The results of the study indicated that there is a good match between the values of groundwater levels that calculated in the model and measured in the field, where mean error is 0.09 m.

The study also showed that the increasing of water surface elevation of the Tigris river led to increase in the hydraulic head of observed wells, while the use proposed pumping well reduced the hydraulic head and intercepted the movement of groundwater flow. The flow direction is toward the Tigris river, and the velocity of flow is clear in the third layer identified medium sand which is 0.0015 m/day. The using of the proposed pumping well has changed the direction of groundwater, especially in the area around the well.