Optimum Utilization of Ground Water Resources In A heavily Exploited Aquifer

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Abstract

This paper is to prepare and arrange a mathematical model for Tehran's Aquifer, in which the quantitative and qualitative changes due to the recharge sources and discharge wells are studied. The effect of the recharged and discharged waters, which have different qualities (including solid content and contamination) would be indicated. Tehran Large City with a population of about ten millions is located in an area, in which different factories such as car factories, surfactant factories, benzene pumping stations and other related matter are available in the region that have a negative effect upon the water aquifer. In later years and because of the lack of portable water in the area, more water abstracted from the aquifer. For the reservation and a continuous maintaining of the aquifer water for different purposes and uses, it is thought that the amount of the returned water from different sources in this case is very relevant, and therefore, it is taken in consideration. For studying the above aquifer, a two dimensional finite element model was prepared and calibrated for the hydraulic and solute transport aspects for a relatively long period of time so that to be able to forecast the effect of aquifer exploitation and waste infiltration for the future projects. For the protection of the aquifer, a suitable recommendation for controlling contamination of water at different locations of Tehran's Valley is suggested.