

A NUMERICAL MODEL TO SIMULATE GROUND WATER FLOW OF WADI ARAR - WESTERN DESERT

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ABSTRACT

Wadi arar can be regarded as one of the main wadies in the west-southern part in the kaqi western desert. Geological formation back to U.cretaceaus to Miocene are exposed in the area. The uppermost regional aquifer is the target of the present study, this aquifer extends with Hartha ,Um Er Radhuma, and Tayarat formations . Transmissivity values of the uppermost regional aquifer were ranged from (20 m² I day) to(21 00 m²day).Two- ditional numirical model was used to simulate the ground water flow of the studied aquifer desigen by Rausch&Kinzelbach,1998 at two stages:steady and unsteady state. Result of steady state showed good agreement with the observed head in which the model is highly sensitive to the hydroulic conductivity values changes .Unsteady state simulation for 5-years period with abstraction rate of (10 l/sec) equal to 1m³/sec for all cells indicates slight drawdown .Accordingly, the abstraction rates were increased to 50,150 l/sec(equal to 10.4 m³/sec) depending upon the cell size ,and it was found that the total head drop were ranged from(0.27'2.66 m)which represents approximately 3.5% from the total saturated thickness of the aquifer, this reflects the high potentiality of the Wadi area for the future exploitation of the considered aquifer.