Abstract

For the agglomerations tributary of the aquifer of the alluvial plain of the Isser wadi, the groundwater represent the principal water resource intended for the drinking water supply, agriculture and industry. With the industrial and demographic development (228 466 inhabitants in 2003, estimated by the ONS), the demand for water becomes important and questions on the threats which weigh on the perenniality and the quality of the resource. In this context, water of the aquifer was the subject of a mathematical model of the underground flow; this one constitutes a means of follow-up which makes it possible to understand the real behavior of the system and to envisage its evolution in the future. This required to undertake as a preliminary a hydrogeologic study the following which one could highlight the geological structure of the aquifer, his geometry, his piezometric heads, his hydrodynamic parameters, his natural limits, his exploitation and the various existing hydraulic relations between the aquifer and the Isser wadi.

The model in steady state could reproduce the initial head with a rather good precision; it enabled us to quantify the elements of groundwater budget and to restore the chart of the permeabilities hitherto badly known. The coefficients of permeability obtained spread out between 1. 10^{-6}m/s and 2. 10^{-3}m/s in the middle Isser and between 1. 10^{-5}m/s and 2. 10^{-2}m/s in lower Isser. The scenarios suggested in transient state showed a fall of the piezometric level in the alluvia following increasing taking away. These effects undoubtedly were accentuated by the low values of the annual recharge resulted from the water budget, that is to say 85mm for the middle Isser and 93mm for lower Isser. From the point of view of increase in exploitation in the aquifer, the establishment of drillings should be favoured apart from the overexploited zones, as it is the case of the sector ranging between Issers and Bordj-Ménaïel. It is recommended to hold account of the flows of exploitation estimated by A. Guirkanov (1974) with 159l/s and 740l/s respectively in the middle and lower Isser in order to ensure the perenniality and the quality of the resource.

Key words: aquifer of the alluvial plain of the Isser wadi - hydrogeologic study - mathematical model - groundwater budget - permeabilities.