

Permeabilities of the Lower Cretaceous Porous Aquifers of Portugal - prompt estimations.

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The Lusitanian Basin together with the Tejo-Sado Basin holds the largest and most important groundwater resources in Portugal. Both basins are of Ceno-Mesozoic age and in the Lusitanian Basin, its complex sedimentary history has led to the formation of thick karstic and porous aquifers. In both basins the detritic deposits may reach a few hundred meters thickness, integrating multi-aquifer systems.

The porous aquifers of the Lower Cretaceous consist of sandstones (some conglomeratic) and marls. Depending on the geographic location, the Lower Cretaceous sandstones are named differently, i.e. Torres Vedras Formation, Carrascal, Palhaça and Requeixo Sandstones. In less deformed areas, these older formations are usually lying at the deeper levels of the Ceno-Mesozoic Basins. Being at deeper levels decreases their vulnerability to anthropogenic contamination, in opposition to the Cenozoic aquifers that are usually at more superficial levels and strongly impacted by human activities. The depth, confinement and good water quality of the Lower Cretaceous Aquifers attributes them a strategic character of water reserve that should be protected and efficiently managed. Hence, characterizing the hydraulic parameters of such important aquifers allows assessing better their potential and valuing as a resource of groundwater to satisfy human needs.

However, often there is no available technical information that can be used to calculate some hydraulic properties and such lack of data hinders the normal use of appropriate methods. Upon this situation, any other estimation of the rock permeability must be done with caution assuming its inherent errors. In any case, for the purpose of some studies those rough estimations, if done consistently, can represent good enough approximations to the real values.

In this work, we present permeability values estimated for the Lower Cretaceous of the Lusitanian Basin. Permeability was calculated from specific flowrate values, which were derived from pumping tests as reported in drilling logs. Of the 213 available drilling logs of wells reaching the Lower Cretaceous (outcropping or not), 71 could be used for the purpose of this work, because they were tapping solely the formation of interest and no other. A preliminary analysis of the data shows how permeability values of the Lower Cretaceous varies geographically, with depth and within the same aquifer system, thus offering a general overview of that important hydraulic parameter Basin-wise.

Keywords

Permeability, Lower Cretaceous, Lusitanian Basin

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