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Derived relationship between geoelectric and hydraulic parameters in Bara basin, Sudan

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Bara is located in North Kordofan State in Central Sudan, which is considered as one of the most important provinces as far as the natural resources are concerned but it still encounters a lot of problems related to the water resources. 41 geoelectrical soundings data using Schlumberger array were carried out in the vicinity of 17 pumping test sites to determine the aquifer parameters in Barabasin, and the layer parameters such as true resistivity and thickness were determined for both the shallow and deep aquifers. Formation factor was calculated from the resistivity data. Correlation between these parameters and available pumping test data yield significant relationships between: (a) the hydraulic conductivity and formation factor, (b) hydraulic conductivity and modified aquifer resistivity, and (c) transmissivity and transverse resistance. This study signifies that geoelectrical techniques offer a reliable alternate approach for estimating the hydraulic characteristics of alluvial aquifers.

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