

Geoelectrical Maps of Aquifer Horizons of Fatha Formation / NW Iraq

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The study area lies in the northern part of Iraq with 45 km distance to the south-west of Mosul city on the right bank of Tigris River at Mishraq sulphur mine. In the present study, resistivity logs of long normal array (64"N) for (41) wells were analyzed and true resistivity values were computed for (792) rock units covering the confined aquifer of the lower part of Fat'ha formation. The aquifer was divided to three water bearing horizons (WBH) underlying the dynamic water level.

Geoelectrical parameters of the three (WBH) were plotted as maps of isopach, longitudinal conductance, transverse resistance, longitudinal (bulk) resistivity, transverse resistivity, average resistivity, electrical conductivity, coefficient of anisotropy, and bulk transverse resistance. Those maps enhanced three important issues, first one is not obvious relation between the structural features (anticlines and faults) and thickness variations of the three (WBH).

The second one is the decreasing of bulk, transverse and average resistivity and the increasing of longitudinal conductance and electrical conductivity of (WBH) at the northeast & southwest parts of the main axis of Mishraq anticline and also at middle fault region near the river.

The third is a comparison between the second and third maps of (WBH) of coefficient anisotropy has indicated obviously the pseudoisotropic (1.09) at the middle fault region. This phenomena reflects the similarity of the transverse and longitudinal resistivities which are also characterized with very low values displaying a secondary porosity with high water movements in this region. The latest conclusion has important implications in the hydrogeological situation.

Keyword : *resistivity- geophysics.*

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