

# **Electrical Resistivity Investigations for Guiding and Controlling Fresh Water Well Drilling in Semi-Arid Region in Khanasser Valley, Northern Syria**

Jamal ASFAHANI

Geology Department, Atomic Energy Commission, Damascus, Syria

e-mail: scientific@aec.org.sy

## **Abstract**

Electrical resistivity survey is conducted in the Khanasser Valley, considered as a semi-arid region in Northern Syria, to guide and control fresh water well drilling. Vertical Electrical Soundings (VES) are carried out near the existing wells, which were also used to measure salinity and conductivity of water samplings. Resistivity and hydrogeological data combination made it possible to establish empirical relationships between earth resistivity, water resistivity, and the amount of total dissolved solids (TDS). These relationships are used in the present research in order to follow the TDS salinity variations, both in lateral and depth directions, along the longitudinal profile LP3, located in Khanasser Valley. Apparent salinity map under this profile is established for Quaternary and Paleogene deposits, and boundaries of suitable areas for fresh water well drilling in the totality of the Khanasser Valley are drawn. It was shown that excessive fresh-water depletion may affect the groundwater quality by upward seepage of saline water. Therefore, it is important to keep the fresh-salt water interface in a stationary situation. The geoelectrical methods widely contribute in determining the position of such interface, and can be easily applied in similar arid areas.

**Key words:** geoelectrical resistivity methods, hydrogeology, semi-arid regions, Khanasser Valley, Syria.