

Abstract Siliyin spring is one of the many natural fresh water springs in the Western Desert of Egypt. It is located at the central part of El-Fayoum Delta, which is a potential place for urban developments and touristic activities. Integrated geoelectrical survey was conducted to facilitate mapping the groundwater resources and the shallow subsurface structures in the area. Twenty-eight transient electromagnetic (TEM) soundings, three vertical electrical soundings (VES) and three electrical resistivity tomography (ERT) profiles were carried out around the Siliyin spring location. The dense cultivation, the rugged topography and the existence of infra structure in the area hindered acquiring more data. The TEM data were inverted jointly with the VES and ERT, and constrained by available geological information. Based on the inversion results, a set of geoelectrical cross-sections have been constructed. The shallow sand to sandy clay layer that forms the shallow aquifer has been completely mapped underneath and around the spring area. Flowing of water from the Siliyin spring is interconnected with the lateral lithological changes from clay to sand soil. Exploration of the extension of Siliyin spring zone is recommended. The interpretation emphasizes the importance of integrating the geoelectrical survey with the available geological information to obtain useful, cheap and fast lithological and structural subsurface information.

Keywords Geoelectric · TEM · ERT · Siliyin spring · Egypt