

SCG010-P02

Room:Convention Hall

Time:May 25 10:30-13:00

Reconnaissance Geophysical Survey of groundwater aquifer at Ayun Musa Hot Springs, Egypt

gad el-qady^{1*}

¹Nat. Res. Inst. astronomy & Geophysics

Since the beginning of the history, Sinai Peninsula is one of the main geographic units of Egypt. It lies at the crossroads of the continents of Africa and Asia, and actually represents the Asiatic part of Egypt. It had always been evident that Sinai region has a great economic development. Now, Sinai is moving rapidly towards huge investments in development. Groundwater is one of the main resources for such development projects. One of the targeted areas for development is Ayun Musa area.

Ayun Musa area lies on the Eastern side of the Gulf of Suez. Generally, the area is flat, but includes a few minor topographic highs occurring at different localities in the central and eastern parts of the studied area. The geological succession at Ayun Musa area starts by the Miocene rocks represented by Marl, sandstone, and limestone at other parts with thickness up to 150 m. This is, uncomfortably, followed by lower Cretaceous Nubian sandstone. The Nubian series in the area is differentiated mainly into marine formations of upper Jurassic and Lower Cretaceous age with dominant thickness succession of clays and Limestone containing intercalated water-bearing sandstone with thickness up to 150 meters. This unit is followed by upper Jurassic rocks of Marl, sandy limestone interbeds with total thickness of 110meters.

Structurally, the Gulf of Suez depression is one of the most intensively faulted area in Egypt. Many tectonic movements have taken place in the area since early times of Precambrian. During the early cretaceous to late Miocene period, there was vertical uplifting of the earth's crust, together with the effect of the complicated tectonics that arose from anticlockwise rotation of Arabian relative to African plates during that period. Locally at Ayun Musa area, there is a major uplifting system extending ENE-WSW direction.

The geophysical investigation described in this work was carried out by DC resistivity survey utilizing Schlumberger array of electrode separation. Nineteen Vertical electrical sounding stations (VES) were measured in the area. The electrode separation started with $AB/2 = 2$ up to 1000 meters in successive steps. The distance between stations varies between 300 and 500 meter as to be more or less in grid pattern. However, some considerations had been taken into the account such as the land surface slope might not be more than 30 degree along the spread. Such points imply the basis and the applicability of the Schlumberger array. Altogether hindered us to make all the stations with the same spread direction.

Keywords: DC resistivity, groundwater, Sinai, Egypt