



Using Vertical electrical sounding survey and refraction seismic survey for determining the geological layers depths, the structural features and assessment groundwater in Aqaba area in South Jordan.

Emad Akawwi, Abdallah Alzoubi, Zvi Ben Abraham, Abdel Rahamn Abo Alades, Rami Alrzouq, Gidon Tiber, and Tina Neimi

Al-Balqa' Applied University, Surveying and Geomatics Engineering, Fuhais, Jordan (ejeakawwi@hotmail.com)

The study area is the Aqaba region (Southern wadi Araba basin). Aqaba region area located at 87900 and 89000 North and 147000 and 158000 East (Palestine grid). Tectonically Aqaba area lies within the tectonic plate boundary along the Arabian and African plate slide. This plate boundary comprises numerous and short fault segments.

The main aims of this study are to assess the groundwater potential and its quality, to explain the subsurface geological conditions and support the ongoing geological, environmental and hydrogeological studies. Therefore, it was anticipated that the results of the geophysical surveying will give many different important parameters as The subsurface geological features, thicknesses of the different lithological units, depth to the bed rocks and depth to the water table.

The groundwater can apply an important role in ensuring sustainable water supply in the area. This study was carried out in order to assess groundwater condition, geological layers thicknesses and structural features in Aqaba area by using vertical electrical sounding (VES) surveys and refraction seismic techniques. There are three geoelectrical cross section were carried out at different sites by using the Schlumberger array. The first cross section indicated three layers of different resistivity. The second cross section indicated four layers of different resistivity. The third geoelectrical cross sections indicated three layers. The refraction seismic method also has been conducted in the same area as VES. About 12 refraction seismic profiles have been carried out in the study area. The length of the first profile was 745 m at the direction N-S. This profile indicated two different layers with a different velocities. The length of the second profile was 1320 m with E-W direction. This profile indicated two different layers. The length of the third profile was about 515 m with a direction SE-NW. It recognized two different layers with a different velocities. The fourth profile was N-S direction and the length of this profile was 950 m. Two different layers were recognized along this profile. The fifth profile was located N-S with length about 340 m. Two layers were recognized from this profile. The sixth profile was located N-S direction and the length about 575 m. Three layers were recognized from this profile. The direction of the seventh profile was N-S with a length of about 235 m. two different layers were recognized the top layer was unconsolidated alluvium. The profile number 8 was located N-S with length about 232 m. two layers were conducted from this profile. The direction of ninth profile was NW-SE with length about 565 m. two layers were conducted along this profile. The length of the tenth profile was 235 m and the direction was N-S. Two layers with a different velocities were detected along this profile. Profile number eleven was located SW-NE with length about 475 m. two layers were recognized from this profile. The length of the last profile was 375 m with direction SE-NW. Two layers were conducted from this profile.

It was found that the shallow aquifers exist at a depths ranging from 4 to 19 m and the relatively deep aquifers from 24 to 60 m below the ground surface.

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