



Integrated geophysical study to delineate the subsurface structures in Siwa Oasis, Western Desert, Egypt

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Siwa Oasis is located within the Western Desert of Egypt and is a potential candidate for the development. It represents one of the most interesting and distinct region of Egypt. The main goal of the present work is to study the subsurface structures in Siwa Oasis area, Western Desert, Egypt and to determine their effects on surface geologic structures. To achieve this, two geophysical methods (magnetic and geothermal) have been used in this study. A detailed land magnetic survey was performed. The necessary reduction concerning daily variation, the regional gradient and time variation observation were applied. The measured total magnetic field was corrected and reduced to the north magnetic pole. Data analysis was performed using trend analysis, Euler deconvolution, high pass filter, analytical signal. The results indicate that the area is affected by tectonic forces in the NE-SW, NW- SE and E-W directions.

Geothermal studies in some places in Siwa Oasis were carried out using the device of thermo-physical properties (Isomet-104) for measuring the subsurface temperature contour map (30 meters below the earth's surface). This map illustrates that there are good geothermal regions have hot groundwater reservoir. The measurements of geothermal properties of some rock samples such as thermal conductivity, thermal diffusivity, volume capacity and thermal values gave us an indication about the geothermal of rocks in the subsurface. Also, geothermal studies gave us an idea about the heat flow and the increasing of the energy and chemical of properties of the predominant subsurface rocks in the study area.