

O9-2**GEOELECTRICAL AND HYDROGEOLOGICAL STUDY OF THE SARADOPORON BASIN (CENTRAL GREECE)****ARTEMIOS ATZEMOGLU and MANAKOS ANTONIOS**

Institute of Geology and Mineral Exploration Branch of Thessaloniki, 1 Fragon Str, 54626 Thessaloniki, Greece.

The studied area belongs to Elason country and is lied between the municipalities of Saradaporon and Kalithea. This region is one of the poorest Greek countries and agricultural activity is the main occupation. The results, which had arose after hydrological researches, pave the way to economical development.

Morphologically, the area is directly connected with the regional geological formations and the intense tectonic activity. There are three geological units marked out in the region:

1. The alluvium deposits
2. The hilly regions which contain calcareous and gneiss-schist rocks, and
3. The mountainous region which extents in a wider area and consists of compact rocks (gneiss schists, marbles).

Torrents and streams are passed through the area and deepen their main bed. The studied area belongs to the Pelagonian zone which consists of marbles, gneiss-schists, tertiary and quaternary deposits.

The tertiary and quaternary sediments cover a large area in the studied basin. The marble intercalations occur locally in the middle of the metamorphic formation and as middle Triassic-Jurassic marbles in the upper edge of the stratigraphic column.

The hydrogeological research was focalized to:

1. The localisation of substratum aquifer layers
2. The possible hydraulic communication between these substratum aquifer layers
3. The estimation of the substratum waters and
4. The qualitative control of the substratum waters.

The aim of the extensive geophysical research, which was realized using the geoelectrical method, was:

1. The determination of the sediments thickness by recording the stratigraphy of the Saradaporon basin.
2. The definition of tertiary and quaternary deposits by evaluating the thickness of aquifer layers.
3. The verification of the continuity and the relationship with aquifer layers of the central and the southern part of the basin.
4. The tectonic regime of the above studied area and the substratum localization.

The aim of the hydrogeological research was the localization of the substratum aquifer layers, which may present favorable circumstances for subterranean aquiferance.

In the studied area 142 vertical electrical soundings (V.E.S.) were carried out (Schlumberger configuration). The development of the current line (AB/2) was 320 to 800 m. The V.E.S. were realized in 14 NW-SE directed parallel profiles which were in a 14×12 km grid. The distance between the profiles and between the centers of the soundings was 500 or 1000 m.

The V.E.S. is based on the definition of the apparent resistivity (ρ_a) variation of the layers in relation to depth. To measure the apparent resistivity (ρ_a), at the center of each configuration, we transmit DC current (I) through the current electrodes (C1, C2) and we measure the potential ΔV between the

potential electrodes (P1, P2).

Three soundings were conducted near existing boreholes in order to calibrate the resistivity value-lithological unit correlation.

After data treatment, we have determine 5 geological units:

1. The upper geoelectrical formation, which covers superficially almost the whole area, consists of marls and white clays with unconsolidated rounded pebbles. The ρ_a values range between 15 and 90 Ω m and its thickness is 3 to 100m.

2. The second geoelectrical formation has ρ_a values that ranged between 17 and 36 Ω m, locally 43 and 60 Ω m, and corresponds the sands and conglomerates of various size and lithological composition. Its thickness is up to 35m.

3. The third geoelectrical formation is gneiss-schists, gneiss and amphibolites. The ρ_a values range between 130 and 500 Ω m and its thickness is up to 150m.

4. The next geoelectrical formation has ρ_a values that ranged between 500 and 1750 Ω m and corresponds to marbles. Its thickness is greater than 500m.

5. Finally, the fifth formation has ρ_a values greater than 1750 Ω m and corresponds to ophiolites. Its thickness is up to 500m.

The results of geophysical research, combined with the 7 realized investigatory drills, are:

1. The substratum of the studied area is represented by the middle Triassic gneiss-schists.
2. There is a big differentiation between eastern and western tertiary deposits (low and high thickness respectively).
3. There is a net of possible, parallel, NE-SD and WNW-ESE directed faults.

The characteristics of the superficial and substratum waters of the wider area are of good quality without special contaminated problems.