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Geophysical Exploration of Aquifer Zones by (Ves) Method at Ayma-Kharagpur, District Paschim Midnapore, West Bengal

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Abstract : Groundwater has been a matter of great concern in the past years due to the depletion in the water table. This has resulted from the over-exploitation of groundwater resources. Sub-surface exploration of groundwater is a great way to identify the groundwater potential of an area. Thus, in order to meet the water needs for irrigation in the study area, there was a need for a tube well to be installed. Therefore, a Geophysical investigation was carried out to find the most suitable point of drilling and sinking of tube well that encounters an aquifer. Hence, an electrical resistivity survey of geophysical exploration was used to know the aquifer zones of the area. The Vertical Electrical Sounding (VES) method was employed to know the subsurface geology of the area. Seven vertical electrical soundings using Schlumberger electrode array were carried out, having the maximum AB electrode separation of 700m at selected points in Ayma, Kharagpur-1 block of Paschim Midnapore district, West Bengal. The VES was done using an IGIS DDR3 Resistivity meter up to an approximate depth of 160-180m. The data was interpreted, processed and analyzed. Based on all the interpretations using the direct method, the geology of the area at the points of sounding was interpreted. It was established that two deeper clay-sand sections exist in the area at a depth of 50-70m (having resistivity range of 40-60ohm-m) and 70-160m (having resistivity range of 25-35ohm-m). These aquifers will provide a high yield of water which would be sufficient for the desired irrigation in the study area.

Keywords : VES method, Schlumberger method, electrical resistivity survey, geophysical exploration
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