Groundwater Potential Evaluation of a Part of Gidan Kwano Campus of the Federal University of Technology, Minna, Central Nigeria Using Geoelectric Methods

Ejepu, S. J. and Olasehinde, P. I.

Department of Geology, Federal University of Technology, Minna, Niger State, Nigeria.

Abstract

Groundwater potential evaluation of Gidan Kwano campus of the Federal University of Technology, Minna, Central part of Nigeria was undertaken using Vertical electrical Sounding (VES) to provide information about the subsurface lithology and structures with the aim of evaluating its groundwater potential. A total of 48 VES was made along eight profiles with six sounding stations per profile within an area of about 10km^2, using the Schlumberger array configuration. A combination of VES, Horizontal Resistivity Profile and Sounding – Profiling produced a subsurface geological appraisal of the study area. The results of the interpretations of VES data were used to produce the Isopach map of depth to Basement and the Fracture map of the study area. The results and the surface geologic map were found to be closely correlated. Fractures located within the study area coincide with the direction of stream flow suggesting that the drainage system is structurally controlled. The VES curves reveal that the area is generally characterized by three geoelectric layers. The top soil layers thickness ranges from 0.2m to 7.4m. The weathered layer has an average thickness of 0.3m to 58.8m. The mean depth to bedrock was computed as 35m. Out of the 48 VES made, 8 VES stations have been selected as priority locations for the development of groundwater resources. The study area has a very high potential for groundwater development. Despite all the limitations of the VES technique, it has been found to be reliable for groundwater exploration in the Basement Complex terrain particularly when the Schlumberger Configuration and combined with computer - aided interpretation for the survey data.

Keywords: *Vertical Electrical Sounding (VES), Horizontal Resistivity Profiling (HRP), Sounding-Profiling (Pseudosection), Groundwater Potential.*

Email: ejepujs@yahoo.com; **Mobile Tel**: +2348034065079