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DETECTION OF GROUNDWATER SATURATED FRACTURES USING GEOELECTRICAL TECHNIQUES OF GRADIENT PROFILING IN THE RGSC OF BANARAS HINDU UNIVERSITY, INDIA

GIRIJA SHANKAR YADAV

Department of Geophysics, Faculty of Science, Varanasi, Uttar Pradesh, India

ABSTRACT

A simplified version of Gradient Profiling technique has been applied in the Rajiv Gandhi South Campus RGSC of Banaras Hindu University, Barkachha, Mirzapur district of Uttar Pradesh, India to identify the low resistive zone. The horizontal electric field was generated in the central region of widely separated two current electrodes fixed at the ground surface and the potential gradient was measured within onethird central region of the total spread using a moving dipole with considerably small electrode separation. The observations were taken along three transects. The lowest value of apparent resistivity was obtained almost in the middle portion of the fractured zone. Interested low along the profile was identified and geoelectrical sounding was also conducted at 12 such locations. One test borehole was drilled at GS8 location and groundwater discharge of about 8,000 liters per hour was obtained during the month of October 2006. Such low discharge of groundwater was obtained due to limited extent of fractures within the sandstone. The analysis presented here clearly shows the efficiency of the gradient profiling technique.

KEYWORDS: Fractures, Gradient Profiling, Geoelectrical Sounding, Hard Rocks, Groundwater Exploration