

Geometry and lithology of the subsurface responsible for collapsing of boreholes in Olobanita well-field, Kenya- Rift

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Abstract:

This project describes the analysis carried out in the Olobanita well-field, Nakuru county, Kenya, using geophysical surveys and geologic logs with an aim of investigating the geometry and lithology responsible for collapsing of boreholes in the Olobanita well field. This has been a major setback in an effort to provide water from the ground water rich basin. In this case therefore, the project employ geophysical surveys and geologic logs to explicitly investigate and characterize the subsurface responsible for the drilling menace recently encountered by Zhonghao Overseas Construction Engineering Company Ltd. Geophysical surveys used include, Vertical electrical sounding (VES), Electrical resistivity imaging (ERI) and ground magnetic measurements. The vertical electrical sounding was done using the SYSCAL R2 equipment in the Schlumberger electrode configuration, electrical resistivity imaging involved the SYSCAL R1 switch 72 resistivity equipment and magnetic measurements utilized the proton precession magnetometer. Results obtained from the geophysical survey were then analysed and related to borehole log information of Olobanita well-field, this has revealed some correspondence between lithostratigraphic units and resistivity values. From the results obtained it is true that the prominent fault systems within the basin alongside the heterogeneity of the ground coupled with the soft loose volcano-sediments are greatly responsible for the collapsing of freshly drilled boreholes in the area. Finally several recommendations are made to reduce or to completely avoid caving in of boreholes during and after drilling