



INTERPRETATION OF THREE GEOTHERMAL FIELDS SITUATED IN EASTERN PART OF SRI LANKA USING RESISTIVITY AND MAGNETIC METHODS.

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Geothermal fields can be introduced as space occupied by the installation of a geothermal system. Geothermal fields in Sri Lanka can be found within Vijayan and Highland, geological complexes boundary. The study was mainly focused on interpreting the near subsurface structure of Wahawa, Maduruoya and Kapurella geothermal fields using resistivity and magnetic surveying methods in order to find out any geothermal sources accommodated beneath the hot water springs. In resistivity survey, both one-dimensional (1-D) and two-dimensional (2-D) resistivity methods were employed using Schlumberger array. The 1-D Resistivity data has shown that all three areas contain relatively low resistive layer in depths up to about 10 metres as the first layer. The 2-D profiles in Kapurella and Maduruoya show a relatively low resistive layer as the first layer which could be interpreted as a mud cap and a high resistive layer in the middle which can be interpreted as country rock. In between these layers there were sub layers with low resistive values which may have occurred due to weathering of the bedrock. In Wahawa a thin low resistive, first layer was observed than previous two cases. Here the high resistive layer has spread in to the depth and no other layers were observed within high resistive layer as in previous two cases. In all three fields, no evidence for a shallow gradient fracture was found beneath the bedrock from the obtained resistivity values. Hence it can be concluded that the geothermal source should be accommodated in another place other than right beneath the springs. Magnetic surveys in three fields have shown relatively high negative anomaly values with compared to the obtained values for positive anomalies. High negative anomaly values hint out about fractures which may be situated around geothermal fields. In Kapurella a negative anomaly gradient which is extending to the southwest-north direction was observed in the prepared map. This feature could be interpreted as a fracture zone spreading to the mentioned direction.

Keywords: *Geothermal, Resistivity, Schlumberger, Bedrock, Subsurface fracture*