Conceptual Model of Menengai geothermal prospect: an update from new Audio Magnetotellurics, Magnetotellurics and Transient Electromagnetic data

Daniel Samperu Saitet

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ABSTRACT

This study involved collection and analysis of resistivity data using Transient Electromagnetic (TEM), Magnetotellurics (MT) and Audio Magnetotellurics (AMT) techniques in the area within and surrounding the Menengai caldera of central Kenya. Both AMT and MT data were corrected for static shift using TEM data from stations in their proximity and an integrated data set is obtained. Data collected previously in the same area using these techniques was also incorporated into the working data base. Inversion of these data sets was performed using the WinGlink Interpretation software. Using this integrated data base, resistivity contour maps were plotted for the Occam inversion at different elevations. Two-dimensional resistivity models were generated using four profiles cutting across the caldera. Interpretation of these results shows three areas with possible exploitable geothermal resources; the Western sector extending about 5km southwesterly, the central caldera region and the southern region. A conceptual model was developed for the Manengai geothermal field. The experience of Olkaria geothermal power density is extrapolated to estimate the potential power generating capacity of the Menengai geothermal field. It is concluded that the resource available at Menengai is sufficient to sustain a steam power generation plant of not less than 836 MW of electricity for a steady production period of 25 years