

EXECUTIVE SUMMARY

Natural Source and Controlled Source Audio-frequency Magnetotelluric investigations have been undertaken on seven lines across the Clifton geothermal area. The goal of this investigation was to characterize fault systems that may be high permeability zones which may be paths for geothermal fluids. Of particular interest are structures in the central portion of the survey area, along the San Francisco River.

The electrical structure of the seven lines is similar, as would be expected given that the total width of the survey area is less than 3 miles. The general earth model is characterized by a low resistive surface zone with resistivities in range of 10 ohm-rn, interbedded resistors might be present (L7, L6, Li) or not (L2, L3, L4, L5), overlying a moderate resistive layer, with resistivity greater than 10 Ohm-in. This resistor extends at depth until it grades into a more resistive body, having resistivity values higher than 100 Ohm-rn. This generally layered earth model appears to be cut by near vertical features, thought to be related faulting in the area. This geophysical program identified five main high-angle contacts; with two located along the San Francisco River.

Determination of the dip angles of the different high angle structures is problematic in this area. The geophysical response is dominated by the changes in near-surface resistivity, which generates “static shifts”. The response of the deeper, larger, targets is buried in these near surface effect. Multidimensional modeling has significantly reduced this complication, but accurate determinations of the dip angles remains challenging.