ABSTRACT

HYDROGEOLOGIC INVESTIGATIONS FOR GROUND WATER RESOURCES IN COMPLEX METAMORPHIC TERRANE

by

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Ground water resources in the upturned low-grade metamorphic tuffaceous rocks (greenstone) in a portion of the Middle Jurassic Oregon City Formation near Cherokee, California are considered limited. Ground water flow in this complex lithology is solely dependent on secondary porosity and permeability and varies with depth as well as lithology.

Of the three surface geophysical techniques employed to investigate the subsurface geology (magnetism, electrical resistivity, and seismic refraction) only resistivity produced qualitative evidence of subsurface geologic conditions utilizing the Schlumberger electrode configuration and Ohm-feet method of interpretation.

Eight ground water samples and four surface water samples were chemically classified using Stiff and Piper
Trilinear Diagrams to graphically represent water chemistry analyses. Seven of the ground water samples were $\text{Ca(HCO}_3)_2$ waters and all surface waters were $\text{Mg(HCO}_3)_2$ waters. One ground water sample typed as $\text{Mg(HCO}_3)_2$ is believed to be recharged by nearby seasonally effluent surface water.

All existing wells in the study area have low yields with the greatest recharge apparently accumulating in topographic low areas. Based on the well recovery test performed on Linam Well No. 4, true well yields may be less than 1 gal./min. In order to supplement domestic and light irrigation needs, surface storage tanks or cisterns are recommended.