9. CONCLUSIONS AND RECOMMENDATIONS

A numerical model was constructed to estimate the volume and distribution of water exchange between groundwater and Lake Tahoe at South Lake Tahoe. The model utilized a 2-cell width boundary condition configuration to simulate lake-groundwater interaction over the gently sloping lakebed surfaced. An array of hydraulic conductivity distributions was provided by the U.S. Army Corps of Engineers, Sacramento District. The model was calibrated to groundwater levels and stream flows measured in fall 1996 and spring 2002. From the model study, an average groundwater discharge to the lake was estimated as 226,000 ft^3/day (2.6 ft^3/sec). A likely range of total discharge rates to the lake in the study area would be 100,000 ft^3/day to 350,000 ft^3/day. According to model results, the total simulated flux to the lake is relatively negligible below 100 ft. This is due to the gently sloping lakebed surface, and the impedance to vertical flow created by confining units. A study was performed to estimate groundwater discharge to the lake using seepage measurements taken by Loeb et al. (1987). Study results produced a rough estimate of 2 ft^3/sec, which correlates well with model results.

Sensitivity analysis indicates that changes in hydraulic conductivity and lake elevation parameters have the greatest influence on simulated groundwater discharge to the lake. Future studies should focus on creating an accurate conceptualization of the distribution of hydraulic conductivity values. Additionally, a regularly scheduled groundwater-level measurement program would help provide a more clear understanding of the effect of seasonal fluctuations on surface water-groundwater interaction in the study area. A key calibration target was stream flows. The model was not calibrated to stream stage because gage stations were thought to be unsurveyed. This was later found to be untrue. The stream gage stations have been surveyed.