

EVALUATION OF AQUIFER PARAMETERS
USING SENSITIVITY ANALYSIS METHOD

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ABSTRACT

The reliability of predictive and management models for ground-water can be improved by better aquifer parameter estimation. As progress continues in the use of computers to simulate ground-water systems, parallel progress must occur in data collection and analysis. Among various methods available for the determination of aquifer parameters, pumping tests occupy a prominent position. The maximum advantage is gained from an in-situ pumping test when geological knowledge of the aquifer and analysis of aquifer test data complement each other. Relying on one piece of evidence, such as single pumping test, might lead to unwarranted conclusions but when used with a combination of other pumping tests, borehole data, geological information, and experience, reasonably accurate conclusions about aquifer parameters can be obtained.

The purpose of this research is to present a technique involving the use of sensitivity analysis to obtain aquifer parameters by fitting the numerical time-drawdown results to those obtained from pumping test. The method is straight forward, quick, inexpensive, and is always objective. No graphical matching is needed. As a measure of error, the rms (root-mean-square) error in drawdown is calculated along with the correlation coefficients between the pumping test data and the theoretically derived results. The best values of transmissivity (T) and storage coefficient (S) were selected as those which give small rms error and large correlation coefficient.