

Advanced Techniques for Aquifer Test Analysis

A One-Day Workshop To Be Presented by Glenn M. Duffield,
HydroSOLVE, Inc. at the Arizona Hydrological Society Annual
Symposium in Tucson, AZ on September 1, 2010

Derivative Analysis and Diagnostic Plots for Enhanced Pumping Test Interpretation

8 am to 11 am

Despite its first appearance in the petroleum engineering literature nearly 30 years ago, derivative analysis, a powerful diagnostic tool for the identification of flow regimes, aquifer boundaries and more, has received surprisingly little attention from groundwater scientists and engineers in the interpretation of pumping tests. Learn how to put these diagnostic methods to work for you in the analysis of your next pumping test.

- Identify and isolate flow regimes such as wellbore storage, infinite-acting radial flow and inter-porosity flow
- Recognize boundary effects such as no-flow and recharge boundaries and channel aquifers
- Learn how to use derivative analysis to aid in the selection of appropriate aquifer models and the identification (estimation) of aquifer parameters

Hands-On Computer Exercises

11 am to Noon

Gain direct experience with derivative analysis and other diagnostic methods in the interpretation of real-world pumping test data.

Agarwal Method for Recovery Analysis

1 pm to 2 pm

Agarwal (1980) developed a method for recovery test analysis that is in widespread use by petroleum engineers. Through a simple transformation of the data from a recovery test, Agarwal's method allows one to apply the same diagnostic principles and type curves used for drawdown analysis in the interpretation of recovery data. The

Agarwal method complements the more traditional methods for recovery tests including the Theis residual drawdown method and simultaneous analysis of drawdown and recovery data.

- Improve your interpretation of recovery tests using three separate methods of analysis
- Learn how to apply diagnostic techniques including derivative analysis to recovery test data with Agarwal's method

Hands-On Computer Exercises

2 pm to 3 pm

Learn how to use Agarwal's method in the analysis of real-world recovery test data.

Additional Topics

3 pm to 5 pm

- Case histories developed from aquifer tests in Arizona
- Strategies for dealing with insensitive parameters and parameter correlation during estimation of aquifer properties