

aquifer storativity value of  $1.2 \times 10^{-3}$  is dependent on the transmissivity value determined at well M-1.

Both of the transmissivity values substituted into the storativity calculation provide the same result when rounded to  $10^{-3}$ . This, plus the fact that the transmissivity value derived by separating drawdown components at well M-1 is in good agreement with that derived from the pumped well data, lends support to the conclusion that the aquifer storativity is genuinely in the order of  $10^{-3}$  and that reinterpretation of the data with aquifer test software is unlikely to change that conclusion. Aquifer test software is not designed to make the separation between linear flow drawdown and radial flow drawdown that must be made before the aquifer test response at well M-1 can be interpreted. Therefore, any application of aquifer test software to interpret the M-1 time-drawdown response without pre-processing the data as shown herein will yield erroneous and misleading results.

It should also be noted from Figure 45 that projection of drawdown at well M-1 based on the Theis type curve appears to overestimate drawdown when compared to the radial flow curve separated out of the total observed drawdown. Therefore, the projection of radial flow drawdown shown on Figure 43, is conservatively large.

## **6 WATER QUALITY**

A water quality sample taken from the discharge water during air rotary drilling provided a total dissolved solids (TDS) value of 676 mg/L for water from the Madison aquifer. Subsequent chemical analyses of the aquifer water quality from Test Well #2A are of samples collected after treatment of the aquifer with concentrated acid to stimulate aquifer production to the well. Monitoring of the electrical conductance of the water pumped from the aquifer during the 48-hour yield and drawdown test of the well, as shown on Figure 19, recorded initially high TDS concentrations that steadily decreased to a final TDS concentration of 891 mg/L at the end of the test. As shown by the pre-acid treatment sample collected from the air lift discharge, the final TDS value of 891 mg/L reflects the remaining influence of the acid treatment on water quality.

The test pump generator failed two minutes short of 48 hours of constant rate testing. A water quality sample was not obtained during this constant rate test, which ended 12/5/2012, because failure of the generator was not anticipated. Accordingly, a sample of the water was collected for laboratory analysis on 12/13/2012. This was accomplished with a 175 to 200 gpm pumping rate, using a small pump temporarily installed into the well for final disinfection after the large test pump had been removed.

Continued pumping of the well, combined with increased time for natural diffusion and dilution of the water in the aquifer near the well, will ultimately result in the water quality returning to pre-acid treatment conditions. The water quality laboratory analytical reports are shown in Appendix F. One report shows the total dissolved solids concentration after acid treatment of the well. The other report is for the sample taken on 12/13/2012, eight days after the constant rate test inadvertently ended.

Figure 45: Theis solution for transmissivity and storativity from well M-1 drawdown.

