# Effects of multi-layering in a classical pumping test.

To demonstrate several techniques for the analysis of pumping tests in confined aquifers Vedat Batu presents Example 4-6 on page 160-161 of his book "Aquifer Hydraulics" (1998). The pumping well (Q=540 m3/d) and the two observation wells (r=25 m and r=75 m) are fully penetrating. Resulting transmissivities and storativities of the various methods are found between T=174 and 260 m2/d, and between S=0.000135 and S=0.000666. All methods show a rather poor fit, mainly because the measured drawdown rate during the first 30 minutes is clearly higher than in the later period of the test.

A much better fit can be obtained when the data of both observation wells are analyzed with the MLU software and a two-aquifer (analytical) model is used. The upper aquifer (T=167 m2/d) is separated from the lower aquifer (T=139 m2/d) by an aquitard (c=192 d). Storativities are 0.00026 and 0.00013.
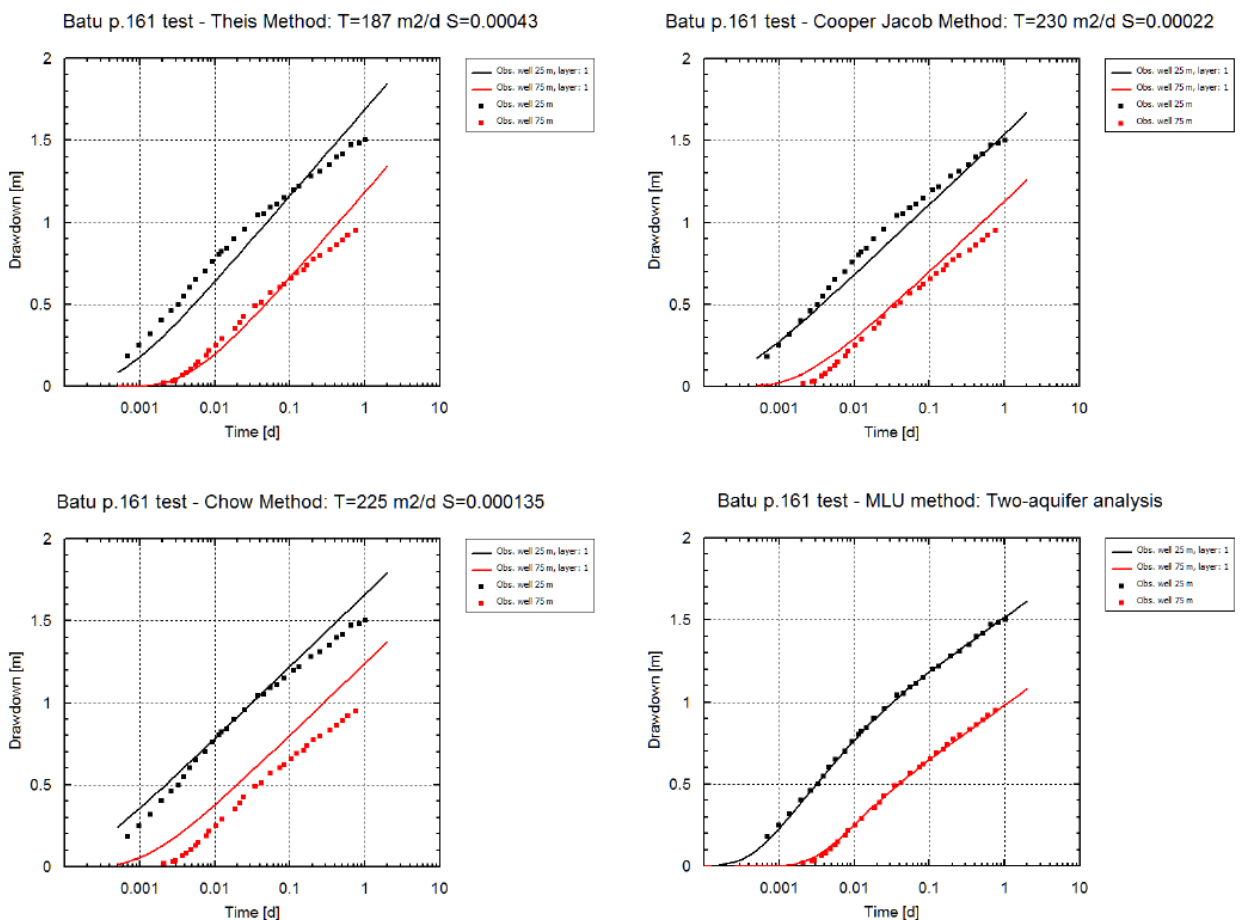
Conclusions:

Analysis of the drawdown data with MLU show that it is likely that a deeper part of the aquifer system also contributes to the pumped aquifer.

The system transmissivity appears to be significantly higher than previously assumed.

A good example of multi-layering effects, not recognized during analysis with classical methods.

Kick Hemker
hemker@microfem.nl
www.microfem.nl