HISTORY MATCHING

Coal seam methane reservoirs are complex and while short term tests, such as drill stem tests and interference tests, will give a snapshot of the permeability at the time of the test, they do not lead to an understanding of the changes in reservoir behaviour over longer time intervals.

Permeability changes in coals may be significant, due to changes in effective stress caused by fluid withdrawal, or due to shrinkage with gas production. The nature of the changes in effective stress may be estimated through mechanical testing. However the end effect on permeability needs to be determined in the ground. To achieve this, permanent reservoir monitoring is required, along with records of production history. Other effects, such as the gas supplied by strata surrounding the coal seam, need to be considered.

Sigra undertakes material balance calculations and uses analytical models for simple test analysis. However, to achieve optimum understanding of the reservoir, the use of numerical models is required. Here the process generally adopted is one of matching reservoir pressures with a given production history. The parameters used in the model are derived from the initial field and laboratory tests, and are then adjusted to provide the best fit of simulation to production data.

Sigra uses in house software, along with the numerical model Simed to match reservoir behaviour.

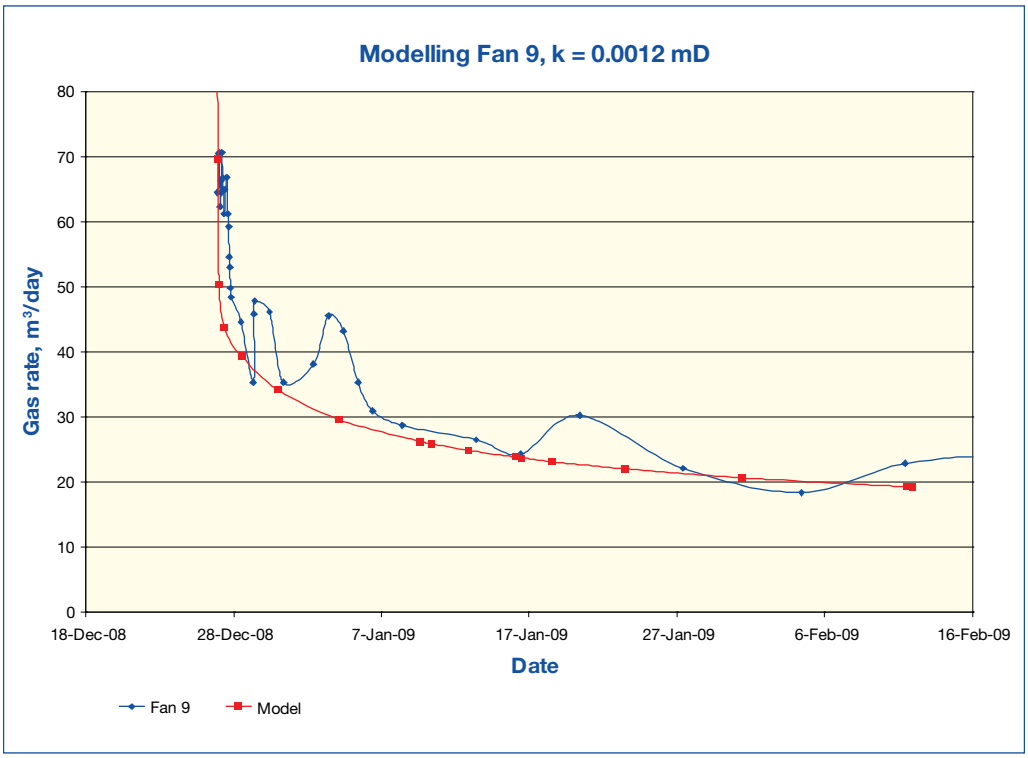

Figure of pressure versus time match

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