Sondex

FLOW CONTRIBUTION & PRODUCTIVITY INDEX IN COMPLEX CONDITIONS

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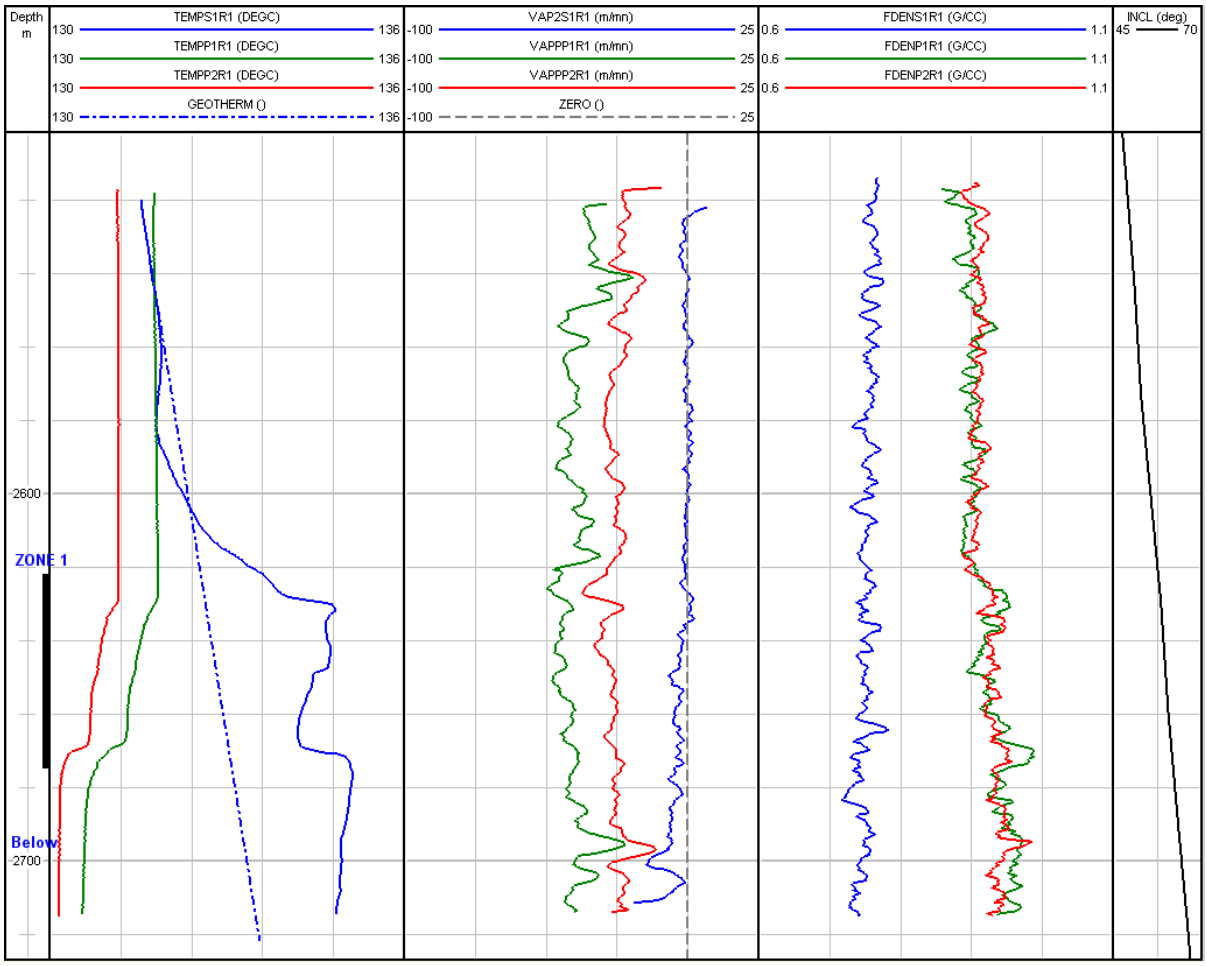

A Memory Production Logging survey was performed in this well under shut-in and 2 flowing conditions. The well is an open hole completion, bit size 8.5", with one producing zone at 2622-2675m and further zones below the deployment hold up depth. The well deviation increases from 50 to 65 degrees across the logged interval. The tool string, run on slickline, can not be run centralized or with a caged fullbore spinner because of the large fractures in the formation; a continuous spinner was run & roller bogies used to facilitate descent; the tool string is running on the low side of the hole. Surface production has +/- 35% water cut.

The shut-in data (in blue) shows a cross flow from zone 1 to the deeper zones, from the temperature and spinner data, and the density data shows this zone is producing oil only. Under flowing conditions the classical apparent down flow phenomenon is observed on the spinner data but the excellent character of the temperature data permits an estimation of the contribution from zone 1, 35% of production on the larger choke, by applying the enthalpy balance mixing method.

To compute the Productivity Index the surface flow rates are converted to downhole rates and then distributed between zone 1 and the lower zones according to the percentage distribution calculated from the flowing temperature data.