

Wireline Formation Testing in High-Overbalance Well Guides Reservoir Management Decisions, Deepwater Gulf of Mexico

Ora platform characterized multiple sands across wide permeability range in challenging high-pressure well and integrated data with reservoir model for real-time contextual insights

A single run of the Ora* intelligent wireline formation testing platform acquired high-quality formation testing data and collected low-contamination fluid samples. While the platform was still in the well, permeability computation and fluid analysis were reported in real time for incorporation in the 3D reservoir model—definitively guiding the operator’s decision making.

The operator’s goal

An operator needed critical data for making completion decisions for an injector well in the deepwater Gulf of Mexico. However, the well posed a challenging environment for wireline formation testing to obtain real-time measurements of permeability for producibility and injectivity calculations and downhole fluid analysis with concurrent representative sample capture. In addition to the high hydrostatic pressure at 22,000 psi and high mud overbalance at 5,000 psi, the multiple target sands were known to differ in permeability. Conventional wireline formation testing tools had not been able to successfully sample some of the low-permeability sands in other wells.

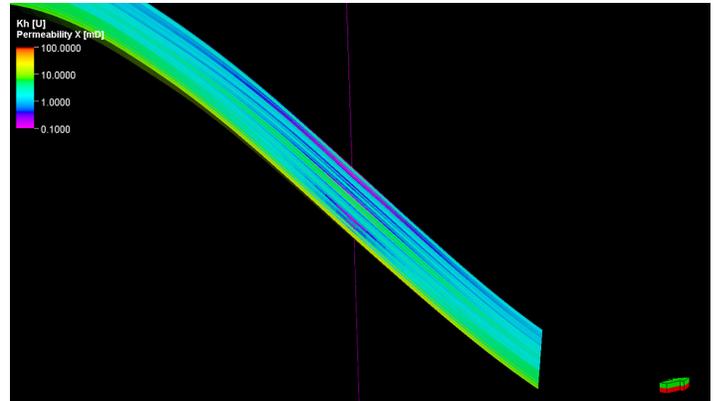
What Schlumberger recommended

Configured with a focused radial probe and flow manager rated to 8,000-psi differential pressure, the Ora intelligent wireline formation testing platform would precisely govern the wideband downhole pump for the very low rates needed in the tighter sands. The flexibility provided by this combination meant that additional runs with different probes were not necessary.

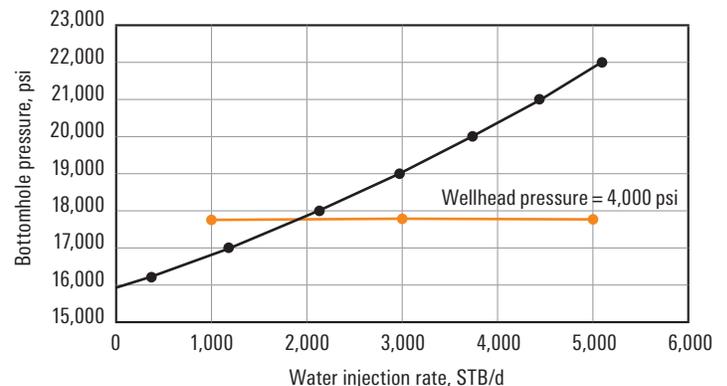
What was achieved

In addition to acquiring high-quality transient testing data, at four stations in moderate-permeability sands, the Ora platform collected fluid samples, all with <5% contamination. In a tight reservoir with <0.5-mD/cP mobility that conventional tools had been unable to sample, the Ora platform easily pumped and sampled fluid.

While the Ora platform was in the well, it was computing permeability and reporting fluid analysis in real time for incorporation in the 3D reservoir model to determine water injectivity rates for various surface injection pressures. Having these definitive insights so early in the completion process provided valuable guidance in decision making to optimize the overall reservoir performance.



With the extensive real-time representative measurements obtained by the Ora platform, the permeability model was quickly updated in great detail.



Ora platform’s data enabled accurately computing water injectivity.

The Ora platform enabled acquiring a fluid sample in a low-permeability interval, which was previously challenging with a conventional focused probe. Ora platform’s pressure transient measurements coupled with injectivity analysis provided deeper reservoir insights.

Petrophysics Advisor
Operator

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