

Case study: Prudhoe Bay, Alaska

OmniView service identified bypassed oil reservoirs and added 7,000 bopd to production

A major global oil and gas exploration company operating in North America required a better understanding of the reservoir fluid distribution in response to the reservoir depletion mechanism to evaluate any bypassed pay zones and optimize production. The original gas-oil and oil-water contacts were perturbed by production, water injection, and gas injection.

Baker Hughes deployed the **OmniView™ three-phase fluid saturation analysis service** to provide a quantitative three-phase formation fluid saturation analysis with wireline logging through casing, delivering valuable insight for formation fluid saturation monitoring.

Historically, for gravity drainage, the operator used the **GasView™ quantitative gas saturation analysis service** of the **Reservoir Performance Monitor™ (RPM™) service** to provide the desired saturation monitoring. In the waterflood areas, where low and variable salinity water was injected to maintain reservoir pressure, the carbon/oxygen (C/O) mode of the RPM service was used to monitor depleting oil saturation. However, reservoir saturation monitoring is challenging when gas, oil, and water columns exist in the same reservoir. The OmniView service combined measurements from

the GasView service, which provided salinity-independent quantitative gas vs. liquid saturation data, and measurements from the carbon/oxygen (C/O) mode of the RPM service, which provided salinity-independent oil vs. water saturation data.

By using the triangulation technique of the OmniView service, the oil-, water-, and gas-saturated zones were modeled for the specific formation and completion configurations as input parameters for Monte Carlo N-particle (MCNP) modeling. These triangulated models were then used to analyze data from the RPM services to deliver a salinity-independent quantitative three-phase formation fluid saturation analysis through the casing.

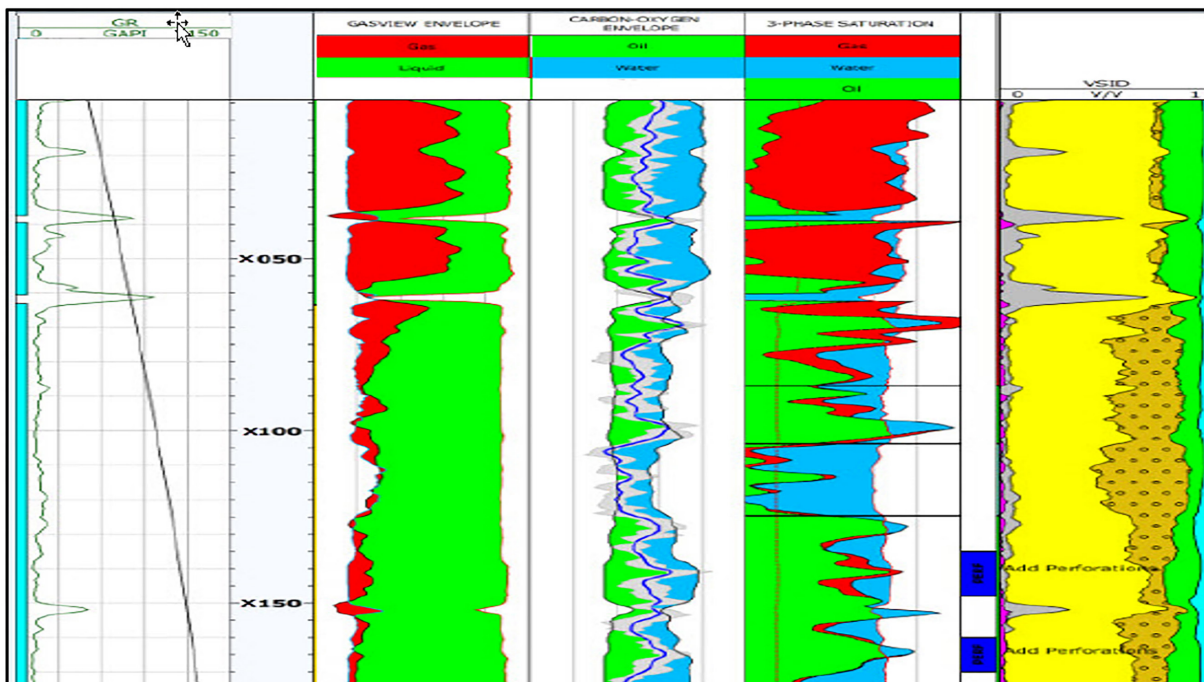
The OmniView service successfully identified the bypassed oil columns, which, after perforation, contributed to a gross incremental production of ~7000 bopd.

Challenges

- Identify all three formation fluids: oil, water, and gas
- Acquire data in low and variable salinity fluids, which were injected in the formation and challenged conventional formation evaluation
- Identify bypassed oil sections through the casing to contribute to production

Results

- Provided three-phase formation fluid saturation analysis through casing
- Identified bypassed pay zones
- Contributed to an incremental production of ~7000 bopd



The OmniView service delivered three-phase formation saturation through casing to identify bypassed oil sections, which, after perforation, contributed significantly to the production.