

A High Value, Low Cost SmartWell® Completion for West Africa Field

Challenge

With operators under increasing pressure to maximize the extraction of marginal reserves, traditional methods of zonal isolation and sand control are offering inadequate levels of durability and flexibility.

The pressures of the three zones were different, and legally and practically the only way to commingle these zones with limited reserves was to control zones with valves. Each of the zones had potential for gas production on the top and water production on the bottom.



Cemented and perforated completions had a history of sand production, and with sand erosion being a top reliability challenge with SmartWell® completions, the well could not be installed without efficient openhole sand control and zonal isolation.

The customer experienced reliability problems with conventional openhole isolation and was also discouraged by the complex operations. The well had to be sidetracked out of the 9 5/8-in. casing due to drilling problems, and the completion had to be run out through a milled window.

Challenge Snapshot

- Extraction of marginal reserves
- Zonal isolation in an openhole, sand control environment
- Hydraulic in-flow control
- Commingling of multiple zones
- Oil-based mud
- Installation of eight packers through milled window

Solution

The solution developed by the customer and Easywell comprised a string with eight Swellpacker® isolation system packers. Intermittent sections of 7-in. blank pipe and slotted liner sized for sand control were easily installed in the oil-based mud. A sequence of Swellpacker system packers was used to avoid gas influx at the top of the permeable formation, and to avoid water influx at the bottom of the permeable formation. To avoid flow between the zones, a packer was set in impermeable formation.

Pressure and temperature sensors with fiber-optic sensors were run on a concentric inner string, as were hydraulic surface-controlled in-flow valves.

Solution Profile

- Swellpacker systems used to eliminate gas and water influx
- Packer used to avoid intra-zone flow
- Fiber-optic pressure and temperature sensors used to monitor downhole conditions

Results

The zones were independently tested, and the sealing of all packers was verified 15 days after installation.

The bottom zone was overpressured and was producing independently for 6 months until commingling was possible and allowed from a regulatory perspective. This well would not have been a SmartWell® completion without the reliable zonal isolation of the Swellpacker® isolation system.

The use of SmartWell equipment removed the need for intervention, and helped accelerate production, while providing data on both reserves and the reservoir.

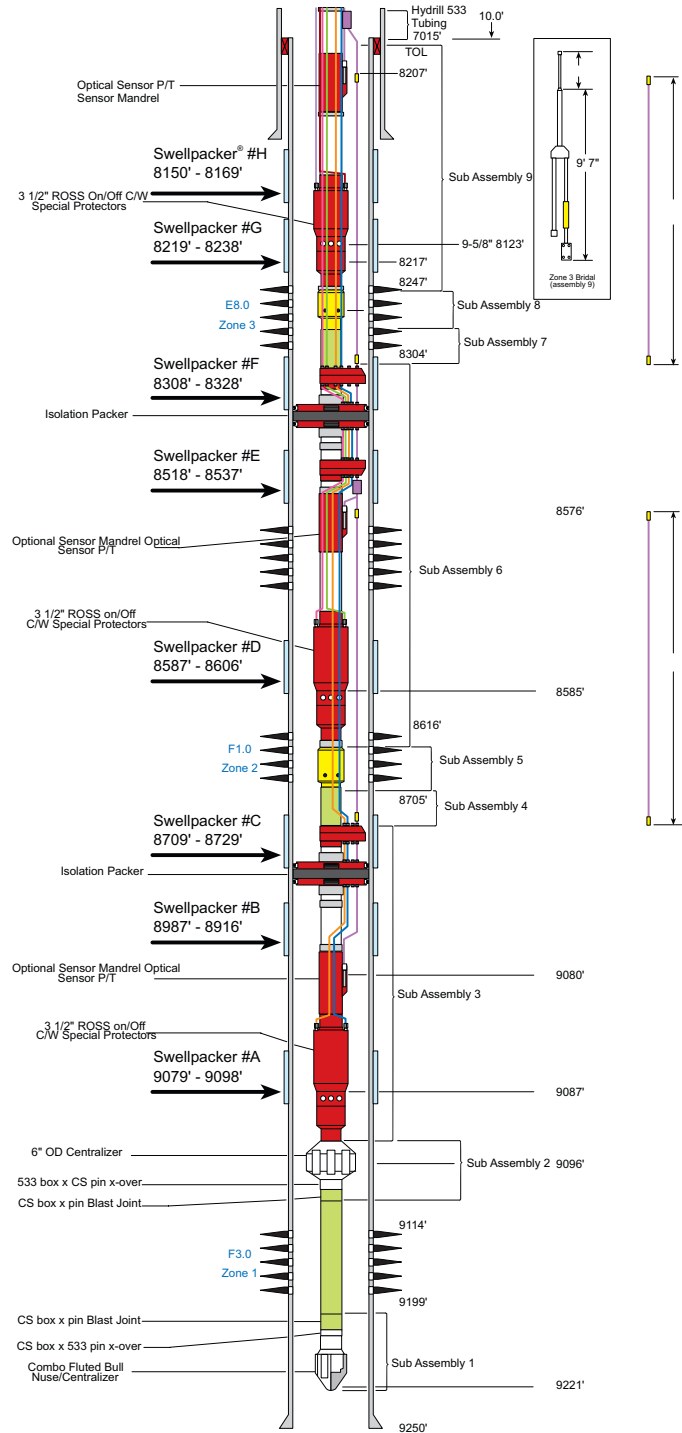


Diagram shows 7-in. string with slotted liner for sand control and inner string. The well was not perforated as the diagram may indicate. The Swellpacker® isolation system packers (arrowed) are shown in light blue. The packer just above the slotted liner is for delaying gas influx, the one below the slotted liner is for delaying water influx, and the packers in between the zones are for zonal isolation.

For more information on any of the details featured here, please contact Easywell@Halliburton.com.

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Actual results may vary in accordance with conditions and other variables.

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