

Introduction of ResFlow ICDs Transitions Wells from 100% Water Production to 70% Oil Production

Initial success convinces operator to choose ICDs for 15 additional wells

CHALLENGE

Prevent well abandonment due to water or gas breakthrough, and maintain sand control over entire lateral.

SOLUTION

Use ResFlow* inflow control device (ICD) with wire-wrapped sand screens to regulate fluid influx and prevent water breakthrough.

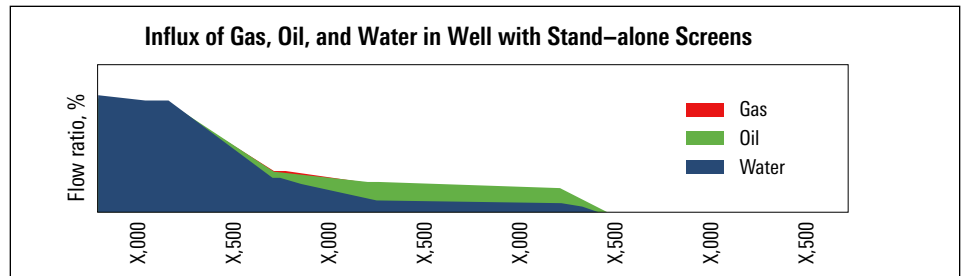
RESULTS

Dramatically reduced water breakthrough, enabling oil to be produced over the entire length of the lateral.



Operator seeks better method of sand control

A major operator offshore Nigeria planned to complete 16 openhole wells in an unconsolidated low-pressure sandstone formation. The formation contained compartmentalized heavy and viscous oil with variable fluid contact. Extended-reach wells were being used to access and drain the reserves. Lateral variations in permeability tended to create unbalanced inflow along the lateral, resulting in premature breakthrough of unwanted fluids. The operator needed to eliminate the problems that had interfered with production in wells completed in a previous drilling campaign in the same field. Those wells had used only stand-alone wire-wrapped sand screens, which had been unable to regulate flow, resulting in total water production.



A production logging test conducted on the well with stand-alone screen showed water breakthrough near the toe. The oil and water flowed uniformly across the lateral until within 1,000 feet of the heel. There, the water cut increased dramatically, causing the well to prematurely water out.

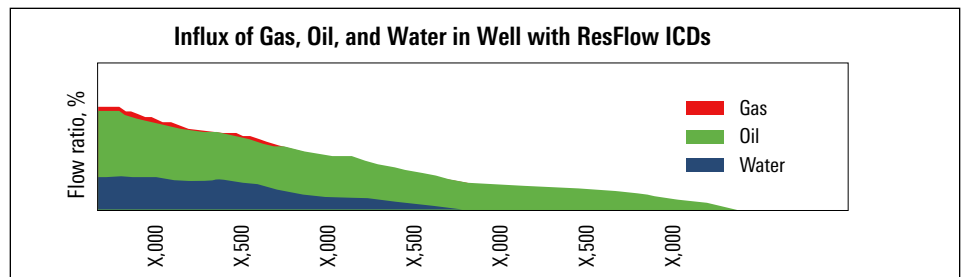
ResFlow ICDs succeeded where stand-alone screens could not

To mitigate these problems, the operator chose the ResFlow* inflow control device (ICD). ICDs are self-regulating nozzles that help balance flow across the reservoir. The nozzle configuration, including size and quantity, is designed prejob and can be adjusted at the rig site before a completion is run.

ICDs regulated flow and prevented wells from watering out

The initial well was completed with 93 ICDs distributed evenly along the horizontal section. When the well began producing, production logging test results showed that inflow was distributed uniformly from heel to toe, a length of almost 4,000 feet [1,219 m], and water breakthrough was greatly reduced compared with wells from the previous campaign.

This meant that the ICDs were performing as designed—improving sweep along the lateral, deferring the onset of water and gas breakthrough, and preventing the well from watering out at any single point. The oil was able to flow freely over the entire length of the lateral. As a result of this success, the operator elected to install ResFlow ICDs in the remaining 15 wells.



A production logging test of the ICD well showed that water and gas breakthrough were clearly being managed. Oil flowed freely over the entire length of the horizontal section, almost 4,000 feet [1,219 m].