Weatherford®

REAL RESULTS

Capillary Injection System Reduces Liquid Loading and Stabilizes Production of Gas, Oil, and Water in Horizontal Wells

Objectives

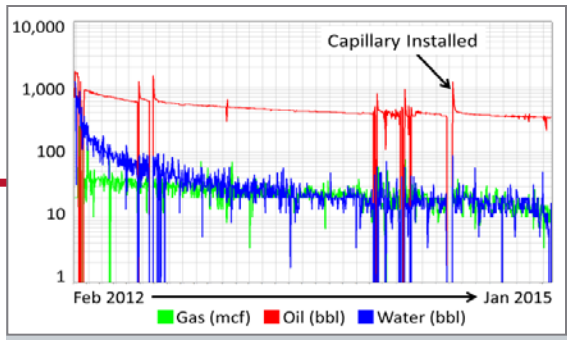
- Stabilize production of gas, oil, and water in three horizontal gas wells that were liquid loading with fluctuating 45 to 60% water cuts.

Our Approach

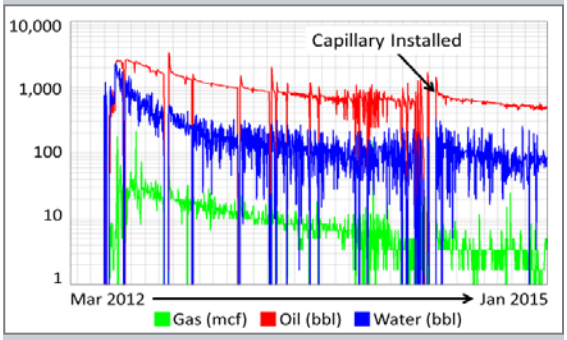
- Weatherford evaluated various artificial lift methods to identify the best method for overcoming the challenges of these specific wells and to identify needed facility changes. The presence of low-pressure gas precluded the use of gas lift, height constraint precluded the use of reciprocating rod lift, and the deviation of the wells precluded the use of plunger lift. The costs to overcome these limitations resulted in a further evaluation of capillary injection systems.
- Weatherford installed 2205 capillary strings into the 5 1/2-in. casing with 2 3/8-in. tubing and a CC1A bottomhole assembly (BHA) set at 12,000 ft (3,048 m).

Value to Client

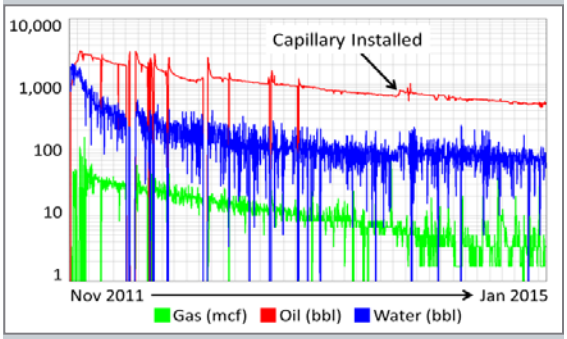
- The Weatherford capillary injection system enabled the client to unload the well and stabilize the production of gas, oil, and water in all three wells.
- Although capillary technology works best with a 60+%, water cut, the client received excellent results with the fluctuating 45 to 60% water cuts and was able to redefine the decline curve.
- Using the capillary system, the client saved money by eliminating the need for additional facility adjustments to compensate other forms of lift.



Graph showing the CVR system results for one of the three gas wells that had 50% water cut.



Graph showing the stabilization of gas production after the CVR system was installed



Graph showing the CVR system maintaining the decline curve for one of the three gas wells

Location
Lindsey, Oklahoma

Well Type
Onshore horizontal gas

Water Cut
45 to 60%

Tubing and Casing Size
2 3/8-in. tubing, 5 1/2-in.casing

Bottomhole Assembly Depth
12,000 ft (3,048 m)

Products/Services
Capillary injection system

Weatherford
po-info@weatherford.com