BAKER HUGHES
a GE company

# FLEXPump*ER* technology, Gas Avoider pump intake handle 13 B/D flow rates

Unlike conventional oil wells, the production decline from an unconventional reservoir is dramatic—going from an initial production rate of 3,000 B/D or more, to less than 50 B/D in just a year or two.

Traditionally, producers install an electrical submersible pumping (ESP) system when production is high and then switch to rod lift when the production rate declines because traditional ESP systems typically cannot handle a wide and varying flow range.

Recently, an operator in Oklahoma met with Baker Hughes, a GE company (BHGE), to discuss artificial lift options for a well characterized by high levels of sand and other abrasives entrained in the fluid, and low flow rates. Initially, the operator opted to deploy an ESP system to effectively draw down the well; however, issues arose related to high gas volumes and excessive sand in the ESP system.

To combat these issues, BHGE installed an ESP system featuring a **FLEXPump*ER*™ extended-range mixed-flow pump** and a **Gas Avoider™ gravity-cup intake**. This new system configuration was able to handle flow ranges as high as 344 B/D and as low as 13 B/D with an average flow range of 80 B/D. The mixed-flow stage design and particle swirl suppression ribs in the diffuser provided better abrasion resistance to the high levels of sand entrained in the fluid.

When production rates declined as low as 13 B/D with a pump intake pressure under 100 psi, the system maintained production with no reliability issues, eliminating the need for an artificial lift system change out.

This innovative, flexible pump design improved reliability and maintained production at extremely low flow rates with average water cut of 78.5%. The operator was pleased that the ESP system with FLEXPump*ER* technology maintained production after rapid production declines and eliminated the need for a system change out. This system solution extended run life despite excessive levels of gas and sand and extremely low flow rates.

## Challenges

- GLR reached levels in excess of 6,000
- Frequent downtime occurred related to high gas volumes
- High levels of sand and other abrasives
- Previous failures attributed to sand/debris plugging flow passages of radial-flow pump stages

## Results

- Maintained production with flow rates from 344 B/D to as low as 13 B/D
- Handled gas, sand, and other abrasives without interrupting production
- Prevented artificial lift change out

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