Biodegradable Gel Pig Operation Boosts Production 58%

Nontoxic gel cleans condensates out of variable-ID piping for optimized production and improved pipeline economics, Texas

CHALLENGE
Restore production rate in small, variable-ID natural gas pipeline while addressing the economics of line maintenance.

SOLUTION
Customize a biodegradable chemical cleaning solution that includes ConcentraGel* gel pig technology to sweep flowline of produced fluids.

RESULTS
Increased daily production rate from 190 Mcf/d to 300 Mcf/d, a 58% increase.

Overcome production decline with pigging
Production from a gas well in Houston was holding up fluid in low-lying areas of the operator’s pipeline, creating back pressure and restricting gas production. The flowline consisted of small and variable line ID, a low working-pressure rating, and tie-ins and bends, all of which pose challenges to accommodating conventional mechanical pigs.

Flush out foulant with robust gel
Schlumberger proposed using ConcentraGel gel pig technology, a high-viscosity, biodegradable product that cleans production-fouling material from pipelines. ConcentraGel technology is composed of crosslinked, food-grade polymers that do not solubilize hydrocarbons but displace and move them down the pipeline.

The operator and Schlumberger worked together to shut in the well and inject 10 galUS of ConcentraGel technology into the flowline; in the 6-in-OD flowline, this volume translated to a 7-ft gel column. The operator then slowly opened the wellhead’s main valve, allowing gas to build behind the gel pig to push it down the line. A 2-in hose was tied in to the main line valve upstream of the production header, and total flow was diverted into a 110-bbl swab tank set at the discharge end of the flowline. The tank was open at the top for gas venting during the pigging operation.

After three hours, the team closed the valve to the receiving tank and allowed pressure to build up in the line behind the gel pig. After 15 minutes, the line pressure at the wellhead was 14 psi. The valve at the receiving tank was opened, and the flowline unloaded 4 bbl of fluid into the receiving tank. The valve at the inlet of the tank was shut again to build flowline pressure once more. After 15 minutes, the line pressure built back up to 14 psi. The valve to the tank was reopened, and the well unloaded 2 bbl of fluid. The test was then concluded.

Enhanced production with decreased pipeline pressure
The gel pig removed 13 bbl of water and 3 bbl of condensate—approximately 9% of the flowline’s fill volume. After the test was concluded, the well’s daily production rate increased from 190 Mcf/d to 300 Mcf/d, a 58% increase in production. Additionally, the flowline pressure dropped from 40 psi to 34 psi.

The operator plans to continue to monitor the well for pressure and production and to deploy ConcentraGel technology in other low-pressure, low-flow wells.