

# BroadBand Services' Composite Fracturing Fluid Improves Production 62% from Thick Shale

Better proppant transport and increased vertical conductivity make better wells in the Wolfcamp Shale, Permian basin

## CHALLENGE

Improve well production by increasing vertical fracture conductivity throughout a thick pay zone with a low-viscosity fluid.

## SOLUTION

Pump composite fracturing fluid system with fiber as part of a BroadBand\* unconventional reservoir completion services treatment to improve vertical proppant suspension and placement.

## RESULTS

Increased cumulative production by 62% in six months.



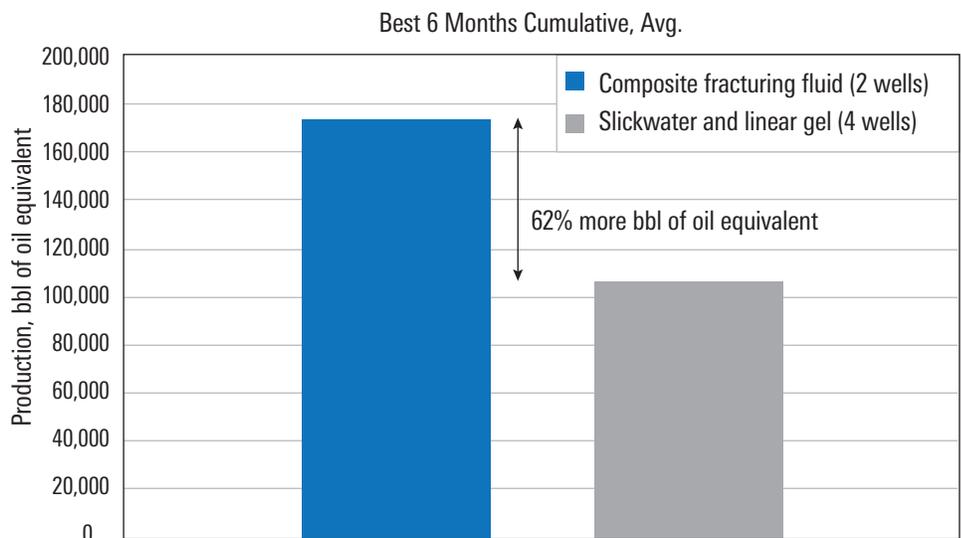
## Create efficient, conductive fractures in a thick pay zone

The liquids-rich Wolfcamp formation in the Delaware basin, Permian, is characterized as an unconventional, deep, and highly pressured shale play target comprising laminated layers with high clay content and heterogeneous formation properties. The Wolfcamp shale is generally developed by horizontal well drilling and hydraulic fracturing techniques. One of the major challenges in the Wolfcamp is the reservoir thickness, ranging from 800 to 1,200 ft [244 to 366 m].

Ensuring thorough vertical proppant placement during hydraulic fracturing treatments in the Wolfcamp interval is a challenge, especially when pumping low-viscosity fluids such as slickwater and linear gel. Low-viscosity fluids tend to enable more proppant settling, resulting in lower conductivity in the upper section of the pay interval, which reduces well productivity. However, increasing fluid viscosity by increasing polymer content can leave polymer damage that reduces the benefit of better proppant placement.

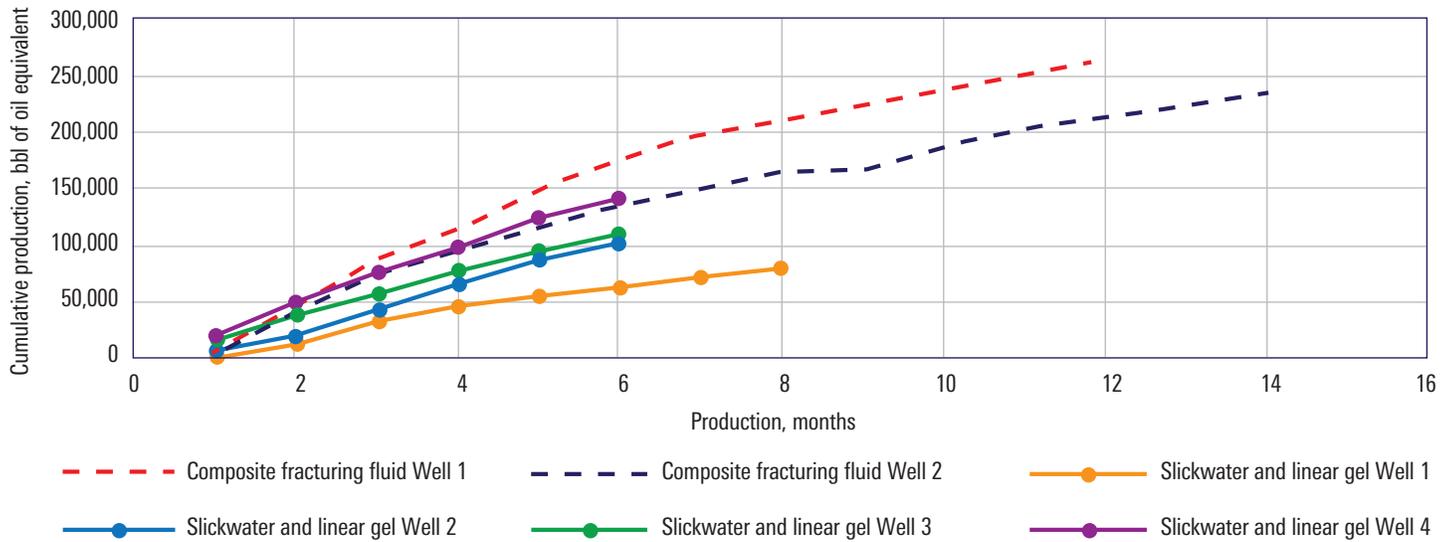
## Keep the proppant suspended

Instead, Schlumberger designed a fracture treatment with its new composite fracturing fluid (CFF) as the fluid component of a BroadBand services treatment. The composite fracturing fluid technology features degradable fibers, pumped in relatively low concentrations throughout the fracturing treatment to improve the low-viscosity fluid's ability to carry proppant and suspend it vertically throughout the pay interval. When engineered for specific well conditions and performance, the technology minimizes proppant settling, increasing the fracture efficiency and the postclosure reservoir contact, which results in higher initial production and estimated ultimate recovery.



Two wells treated with composite fracturing fluid as part of a BroadBand services stimulation treatment produced an average of 62% more barrels of oil equivalent than four offset wells treated with conventional slickwater and linear gel.

**CASE STUDY:** Fracturing fluid using fiber for proppant suspension improves production in thick shale, Delaware basin



Cumulative production data demonstrates the performance of the composite fracturing fluid compared with conventional slickwater and linear gel. CFF Well 1 was stimulated after CFF Well 2, with engineered improvements to the fluid design.

**Produced 62% more than comparable offsets**

A Permian operator used the composite fracturing fluid technology in the Wolfcamp formation in two wells, and a conventional design combining slickwater and linear gel in four offsets with the same lateral length, number of stages, and similar volumes of proppant and fluid pumped. The average 6-month barrel of oil equivalent production for the CFF-treated wells was 62% higher than the offset wells treated with conventional slickwater and linear gel.

The CFF Well 1 was stimulated after the CFF Well 2, with engineered improvements in the fluid design, which likely explains the improved production observed in the second well.

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