



CASE HISTORY

Unconventional Resources

PosiFrac™

OPEN HOLE ACID STIMULATION IN AN UNCONVENTIONAL HEAVY OIL WELL

The PosiFrac Multi-Stage System was used for horizontal open hole fracturing operations in a heavy oil reservoir to increase productivity by accessing natural vertical fractures in the formation

CHALLENGES: An operator in Samara Oblast, Russia recognized poor production from several of their vertical wells in a reservoir containing heavy oil. The reservoir contained natural vertical fractures in the bedding plane and was found to be resistant to horizontal flow through the limestone formation into the vertical production string. The operator needed a cost effective solution to maximize the heavy oil production rate from the reservoir by tapping into the natural fractures in the formation.

SOLUTION: TAM provided a multi-stage system that served as a 4 1/2 in. (114.3 mm) open hole completion liner string. The system consisted of a Liner Hanger Packer, water activated swellable packers (FREECAP), Ball Activated Frac Sleeves, Hydraulic Activated Frac Sleeve, and a Circulating Closing Valve which was run inside a 6 1/8 in. (155.6 mm) horizontal open hole. Acid was used as the stimulation fluid in the operation in order to stimulate the existing natural fractures, as well as open up new fractures in the formation, without compromising the structure of the wellbore.

RESULTS AND BENEFIT:

The PosiFrac Multi-Stage System was installed and nine stages were stimulated across a 3,000 ft. (915 m) horizontal lateral. This was the client's first horizontal well in the reservoir. The stimulation pressure was 1,421 psi (98 Bar) at a flow rate of 25.85 bbls/min (4.1 m³/min). After opening the Hydraulic Activated Frac Sleeve, the customer was unable to establish an injection rate. TAM recommended that the tight formation be spotted with acid on coiled tubing. This established the necessary injection rate and the remaining stages were stimulated as planned. By utilizing a one-trip, multi-stage acidization treatment system that serves as an open hole completion string, TAM was able to save the client significant operational cost providing a one trip system as well as increasing the production rate by accessing the existing natural vertical fractures to assist in channeling the heavy oil into the wellbore.



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