Case Study

QuickPORT IV sleeves unseat plug-and-perf in successful 80-sleeve lower completion

UNITED STATES, PERMIAN BASIN
CEMENTED QUICKFRAC SYSTEM

An operator working in the Permian Basin successfully resolved operational issues in extended reach laterals by deploying ball-activated sliding sleeves for the toe stages of their plug-and-perf completions. This hybrid completion technique proved effective in a significantly longer well that required TREX™ QuickPORT™ IV limited entry sleeves run in 4 sleeve clusters for the first 20 stages. All 80 sleeves functioned as designed, improving reservoir coverage and operational efficiency, while mitigating risks, non-productive time, cost overruns and lost production.

Challenge

The operator had been using plug-and-perf operations, but experienced issues with wireline and coiled tubing for plug setting, perforating and providing sufficient weight on bit for millouts in wells with a measured depth (MD) greater than 20,000 ft. By running QuickPORT IV limited entry sleeves in four-sleeve clusters for the first five stages, the operator lowered risk and successfully eliminated unnecessary costs associated with these operations at extreme depths, while maintaining the limited entry stimulation design as well as eliminating entry point erosion. The operator would continue the rest of the stimulation with plug-and-perf. This hybrid design became part of the standard completion program in wells exceeding 20,000 ft of MD.

More recently, this operator was planning to complete a particularly long well targeting the Wolfcamp formation. The well had a 23,300 ft MD, including a lateral section of 12,200 ft, which would require more than the standard 20 sleeve design to effectively stimulate the lateral.

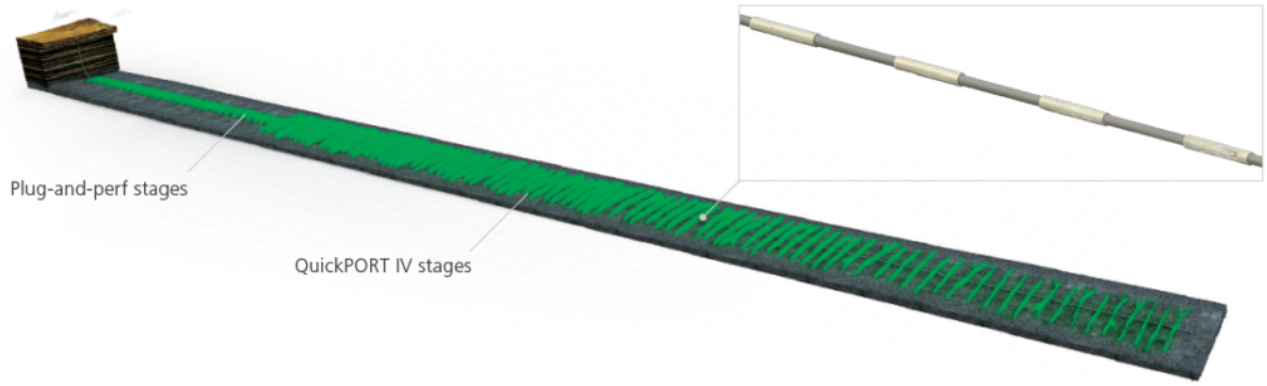
Solution

A significant increase from previous wells, a total of 80 QuickPORT IV sleeves were designed to cover the deepest 3,900 ft of the lateral. The limited entry cemented sliding sleeves were grouped into clusters of four to treat the first 20 stages of this hybrid completion. As usual, the rest of the completion would be done using plug-and-perf.

The TREX QuickPORT IV sliding sleeves allow multiple, individually isolated entry points to be treated together in a single stage. For each stage, one ball opens all sleeves in the zone. Using a continuous pumping operation, incrementally larger sized balls are pumped to activate and stimulate subsequent zones. To facilitate even fluid distribution and prevent entry point erosion, QuickPORT IV nozzles are reinforced with tungsten carbide.

Results

All 20 stages were stimulated in under 70 hours of pumping time, during which the ePLUS® Retina monitoring system verified the actuation of 73 out of 80 sleeves. The success of this completion proves the effectiveness of the TREX QuickPORT IV limited entry system, not only in reducing operational risk for interventions at the toe and saving the cost associated with downtime, but in its ability to perform as a high stage count completion solution.



The 80 QuickPORT IV sleeves of the hybrid system helped the operator mitigate risk, avoid non-productive time, and boost production.

Packers Plus provides field-proven and cost-effective solutions to complete horizontal wells in a range of formations and applications around the world. These include single point and limited entry ball-activated systems, testable toe sleeves, stage tools, liner hangers, as well as offshore and multi-lateral solutions.