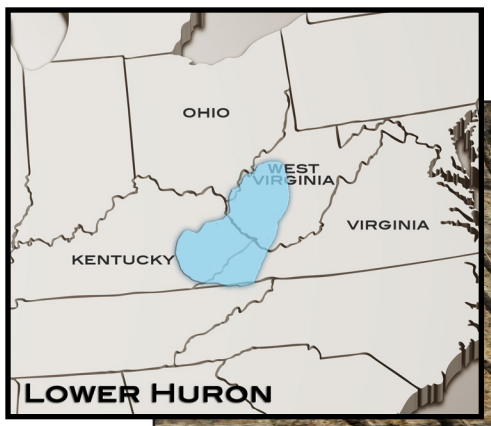
Case Study

Lower Huron Shale Project

Openhole Multistage Stimulation System Provides Reliable, Efficient Solution in the Lower Huron Shale



CHALLENGE

Improve the reliability and effectiveness of Lower Huron Shale completions project. Initial well hole size drilled was 6.125 - 6.25 inches and well lengths ranged from 5,100 to 12,445 feet.

The completion system was required to accommodate a nitrogen fracturing process. The low pressure reservoir required circulation during install to be performed with air or foam.

SOLUTION

Custom design and deployment of the Predator™ Openhole Frac System with custom toe assembly and optional tieback system.

System design was optimized over the four year project. Year one design averaged 11 stages, year two averaged 18 stages, year three grew to an average of 21 stages, and year four wrapped up with an average of 22 stages.

RESULT

Peak's openhole completion system performed effectively and efficiently.

System design was optimized over the course of the project to provide smooth installation, reduced costs, and increased production.

2009-2012 RUN HISTORY

206 wells with 3,438 stages

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Improve Completion Effectiveness

An operator in the Lower Huron was starting a project utilizing nitrogen for the fracturing treatment. Project goals were to maximize production from the low pressure, low permeability reservoir while minimizing operational costs and complexity.

Peak Completions presented the Predator™ Openhole Frac System as a solution to the operator needs. The system consisted of a toe assembly, Predator™ dual element isolation packers, StrataPort™ ball drop frac sleeves, and StrataPak™ liner hanger. Peak's openhole multistage system offered several key benefits for the operator.

The StrataPort™ frac sleeves feature a proprietary ball seat design which can withstand the erosion and tortuosity of high-rate fractures. The internal design ensures that maximum ID is maintained after drill out, which can be performed whether the sleeve is in the open or closed position. In addition, the sleeve's proprietary integral locking system guarantees that the tool cannot close during the production phase, thus maximizing production.

The Predator™ packer incorporates a dual anti-preset feature that prevents premature setting while running in hole, enhancing operational reliability. The tool's short length and small OD enable installation in complex well geometries and increase running performance in horizontal wellbores. Its flexible design allows for adjustment of operating pressures according to local well conditions.

Optimized System Design

Over the course of the project, Peak Completions continued to work closely with the operator in order to perfect the engineering of the tools for the operator's specific application and to optimize the system design.

Initially, the operator was drilling either a 6-1/8" or 6-1/4" openhole and occasionally needed to circulate air or use foam to assist in getting the liner and bottom hole assembly installed. Through engineering review and completion optimization, Peak Completions custom engineered a smaller OD high performance openhole isolation packer which offered the same specifications as the previous generation without sacrificing performance. This, combined with the decision to slightly enlarge the hole size, eliminated the previous installation challenges. Another early change Peak Completions made was to custom design a toe assembly specifically for this project. The new design was an ideal solution for the operator's application and significantly improved well performance, mechanical reliability, and reduced well costs.

As the project progressed, stage count was optimized and the average doubled from 11 to 22 stages. Peak Completions offered up to 24 stages at the time so this was an easy adaptation. In 2013, Peak further developed the technology and released a new sleeve that allows up to 46 stages in a 4.5" system. This reflects Peak's proactive initiative and focus on mission statement of continuous improvement in technology. By working in conjunction with the operator to optimize tool design, Peak is able to provide highly advanced, reliable systems to custom fit their needs.

Reliable, Repeatable Solution

The Predator™ Openhole Frac System was the optimal solution for the project and offered flexibility in adapting to the challenges encountered. Completion cycle time and horsepower requirements were minimized. Higher stage counts were reached and the Peak system allowed maximized pump rates, which increased production from the low permeability shale formation.

In the final 18 months of the project, Peak tools and installations performed at a 100% success rate, proving the successful implementation of engineering optimization and a cooperative partnership with the operator to improve methods and procedures. With a total of 206 wells and 3,438 stages stimulated during the project, Peak Completions was successful in providing improved production and completion efficiencies.

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