StimMORE Service Increases EUR in Barnett Shale Well by 0.25 Bcf

Case study: Integrated approach results in daily production increase of nearly threefold

Challenge
Stimulate the nonproducing heel section of a horizontal Barnett Shale gas well.

Solution
Used StimMORE* service, which incorporates StimMAP* LIVE microseismic monitoring service, to increase stimulation coverage of the lateral and bring the targeted zones to production.

Results
Increased lateral coverage by 25%, resulting in a production increase from 500 Mcf/d to 1,200 Mcf/d. Increased estimated ultimate recovery (EUR) by 0.25 Bcf.

Comparison of microseismic activity before and after the StimMORE refracturing treatment.

Reservoir stimulation in the Barnett Shale
Horizontal completions in the complex Barnett Shale reservoir have increased steadily over the years. The standard completion method in this area is to place multiple transverse fracture treatments across the wellbore. However, declining gas production continues to be a problem with a typical first-year average production decline of more than 50%. As a result, these wells generally need to be refractured within 5 years of the initial completion. Finding an economically feasible way to reenter the well and place multiple fractures in the wellbore is a limiting factor in the number of refracturing treatments that are done today. These limitations make refracturing a vastly unexploited option in this area.

The initial completion of a horizontal cased hole gas well completed in January 2005 consisted of 4 fracture stages across a total of 16 perforation intervals between 7,396 ft and 9,853 ft. Each fracture stage was separated by a mechanical bridge plug.

The well initially produced approximately 4 MMcf/d of gas, but by January 2006, production had declined by almost half. Microseismic data indicated less than optimal reservoir stimulation during the third and fourth fracture stages of the original treatment. Production logs from May 2006 and September 2007 also indicated that a significant portion of the reservoir in the heel section of the well was not producing.
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The client contacted Schlumberger to design a refracturing treatment to stimulate the nonproducing section of the reservoir.

Efficient refracturing of horizontal wellbores
StimMORE service, which incorporates StimMAP* LIVE real-time fracture monitoring service, was selected for the treatment. The StimMORE service enables efficient refracturing of horizontal wellbores to improve well productivity and well recovery.

A single-stage treatment, which required no mechanical plugs, was proposed for refracturing the well. StimMORE diversion stages were pumped to allow for movement of the fracture entry point along the lateral. During the treatment, multiple diversion plugs were pumped based on feedback from the StimMAP LIVE monitoring.

Potential increase in recoverable reserves
During the refracturing treatment, a large section of the original fracture was restimulated and microseismic data indicated that approximately 25% of new lateral was also stimulated.

More importantly, production after the treatment increased immediately from approximately 500 Mcf/d to 1,200 Mcf/d, and payout is expected within 9 months. Additionally, the treatment is estimated to have the potential to increase recoverable reserves by 0.25 Bcf.

About the Contact family
StimMORE service is part of the dynamic category of the Contact® four-category portfolio of staged fracturing and completion services. These technologies maximize reservoir contact by offering the most efficient and effective services for each well. The Contact dynamic category offers fluid-based and tool-free fracturing of multiple stages in one continuous operation. Contact services can be enhanced with real-time measurement options.

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