CASE HISTORY

New take on stimulations to maximize asset value - Eagle Ford

Study confirms normalizing cluster count, injection rates keys to enhancing production

Eagle Ford, South Texas

The challenge

The operator completed its early wells with 17-stage sliding sleeve/frac valve systems with 5 1/2-in. cemented casing, using 20/40-mesh premium white sand proppant. Although the targets, as well as the completion and stimulation designs, were identical, production from the first four wells varied as much as 135%. The transition to various iterations of plug and perf completions resulted in equally mixed results, further reinforcing that factors other than completion types obviously influenced maximum reservoir drainage.

The solution

At the operator's request, STRATAGEN evaluated drilling, completion, and production data, employing, among other methods, bivariate and multivariate statistical analysis and neural network modeling, to determine the parameters that had the most influence over well productivity and net present value (NPV). Through data visualization analysis and predictive modeling, the multi-faceted evaluation revealed that contrary to historical stimulation experiences, higher proppant concentration per effective cluster strongly affected production rates. Furthermore, the study showed that normalizing production data to account for different completion designs was critical for evaluating the performance of individual fractures.

Well Data

Location: Eagle Ford, Frio County, TX

Operator: EF Energy Inc.

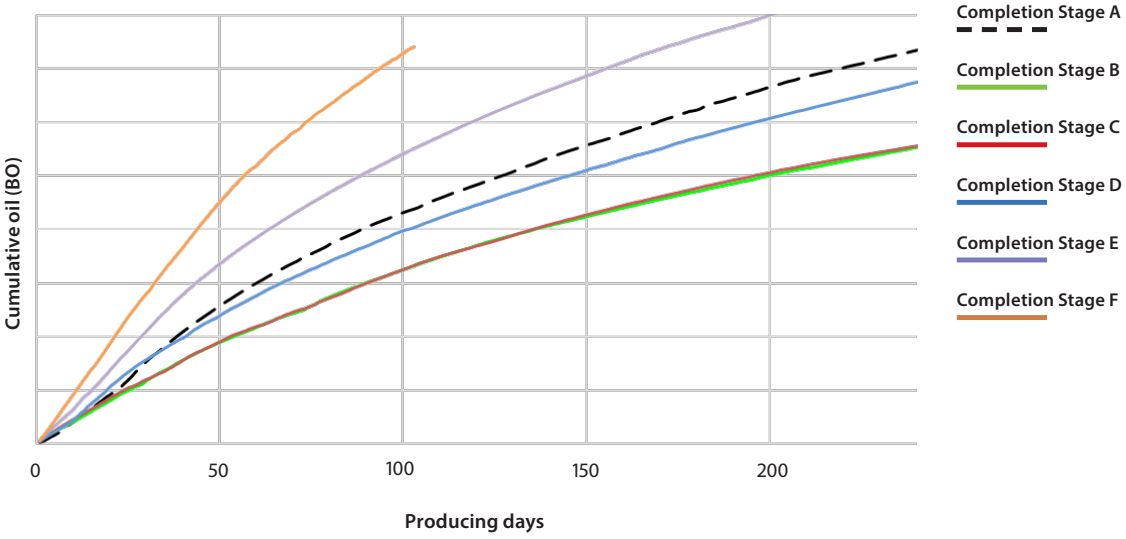
Well type: Oil

Permeability: 10-200 nD

Porosity: 5-15%

Completion design: Sliding sleeve/frac valve, 17 stages, 250-300-ft spacing; plug and perf, 17-27 stages, 3 clusters/stage, 75-100-ft spacing

Design average production results



Source: SPE 170785 "Optimizing Hydraulic Fracture Performance in the Liquids-Rich Eagle Ford Shale - How Much Proppant Is Enough?"

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The results

On the basis of the analysis, the operator altered its completion and stimulation design, resulting in improved production rates. Specifically, within the operator's asset, the highest production to date was realized with a completion/stimulation design incorporating more than 100 perforation clusters at 30 to 50-ft spacing with 80,000 lbm proppant/cluster. Moreover, injection rate per cluster was found to strongly influence fracture performance with best results seen thus far with a per-cluster injection rate of 20 bbl/min. The evaluation also yielded new insights on the completion-production relationship that will provide opportunities to further optimize recoveries.

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Talk to STRATAGEN to find out how we can help you enhance your production.

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