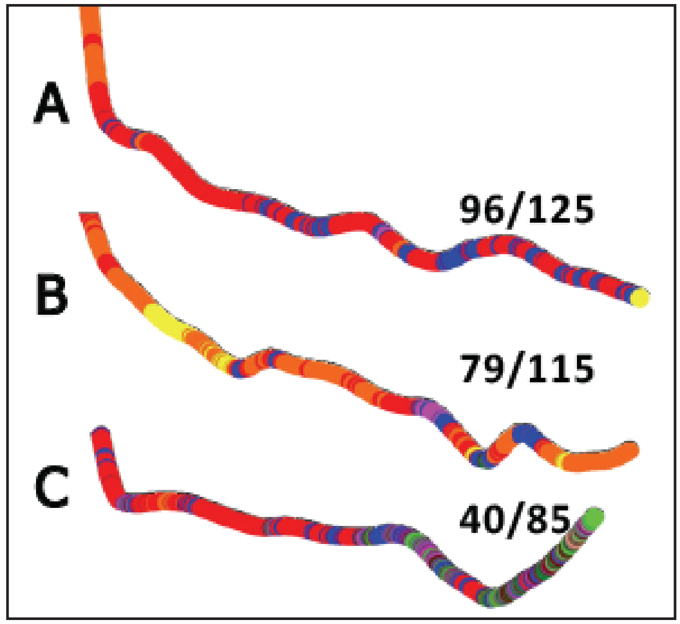
LateralScience℠ Application for Multiwell Analysis and Benchmarking in the Bone Spring Formation

Completion Efficiency and Productivity

When proving the effectiveness of the LateralScience method, one of the strengths of the validation process is that the input drilling data (including weight on bit, RPM, standpipe pressure, torque and rate of penetration) is available on every well, even those that were drilled years ago. This enables NexTier to evaluate historical wells to understand the relationship between actual well productivity and the lateral heterogeneity results from the LateralScience method.

To make this approach credible, we choose sets of wells where conditions correlate closely. The geology, the drilling program and the completion procedures must be very similar on the subject wells, and they should be as close together as possible geographically. When these conditions are satisfied, the primary factors driving variability in productivity between these comparable wells are differences in lateral heterogeneity.

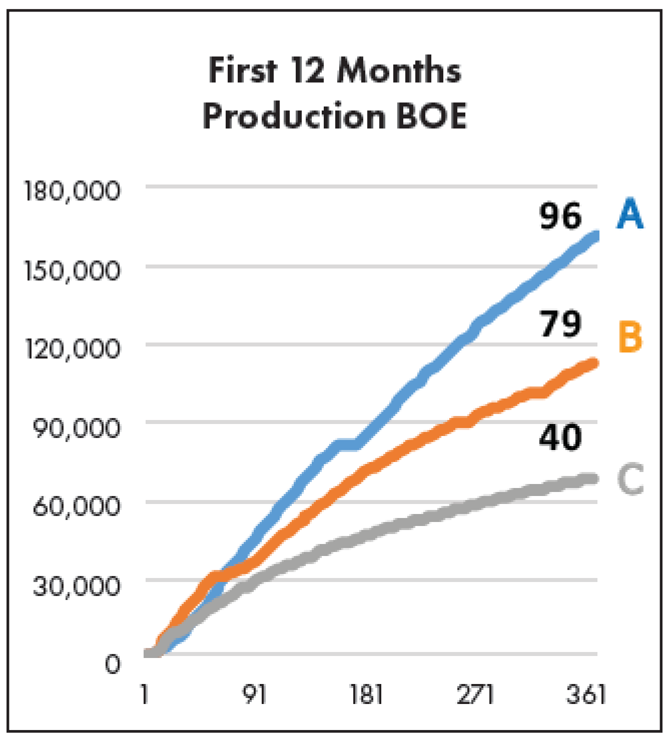


LateralScience trajectory plots for the three Bone Springs wells.

Predicting Productivity in the Bone Springs Formation

The three subject wells were all drilled in 2013 and 2014, targeting the Bone Springs formation. TVD of the horizontal section is 10,640 +/- 20 ft. All completions were executed in a similar fashion; five clusters per stage, with 50-ft cluster spacing and 150,000 lb proppant per stage. The lateral lengths varied between wells (4,400 to 6,150 ft), as did the number of stages (17 to 25). As well productivity can be easily normalized to account for the lateral length, the similarity of these parameters made this set of wells appropriate for our evaluation of the relationship between lateral heterogeneity and well productivity.

Well A produced from a 6,150-ft lateral with a 25-stage completion. LateralScience analysis predicted that 96 of the 125 clusters (77%) would contribute to flow. Well B produced from a 5,550-ft lateral with a 23-stage completion. The prediction for this was that 79 of the 115 clusters (63%) would contribute to flow. Finally, Well C produced from a 4,400-ft lateral with a 17-stage completion where the LateralScience method predicted that 40 of 85 clusters (47%) would contribute



Cumulative oil production for the three subject wells correlates well with the contributing clusters prediction.

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to flow. Well C was particularly interesting because it drilled very much like Well A until the midpoint of the lateral, where it appeared to have strayed out of the target zone. The operator attempted to steer back into zone but ultimately chose to TD the well early because they were unsuccessful in their attempts to get back into the target formation.

Findings

The cumulative oil production curves from the wells' first year online demonstrated an excellent correlation between well productivity and the LateralScience prediction of contributing clusters. The LateralScience method was able to predict the best well (Well A, with 161,355 BOE – or 26,237 BOE/1,000 ft – in year 1) and the worst well (Well C, with 68,801 BOE – or 15,636 BOE/1,000 ft – in year 1). This case study supports the hypotheses that (1) well productivity is influenced by completion efficiency, and (2) the LateralScience method can quantify the completion efficiency while providing qualitative well-performance benchmarking.

The successful results of the LateralScience analyses in the Bone Springs formation convinced the operator to use the LateralScience method to design engineered completions for three wells in a Wolfcamp play that they were actively developing.