

Integrated Completion with ShalePrime Service Raises Oil Production by 70% for Manti Tarka Permian

Combining modeling, rock-fluid compatibility testing, and efficient OneStim services reduces stimulation costs, Permian Basin

CHALLENGE

Maximize oil production by optimizing the perforating, completion, and stimulation strategy for a field development program in the Wolfcamp Formation.

SOLUTION

- Model the reservoir and stimulation design, and match the model to actual production response using Kinetix Shale* reservoir-centric stimulation-to-production software.
- Assess flowback surfactant and clay stabilizer performance on core samples using ShalePrime* rock-fluid diagnostic service.
- Deliver efficient OneStimSM completion and stimulation services based on the new design.

RESULTS

- Improved oil production by 70%, including meaningful contributions from all stages.
- Reduced stimulation cost by 25%, mostly by pumping a lower concentration of a more effective and economical flowback surfactant.



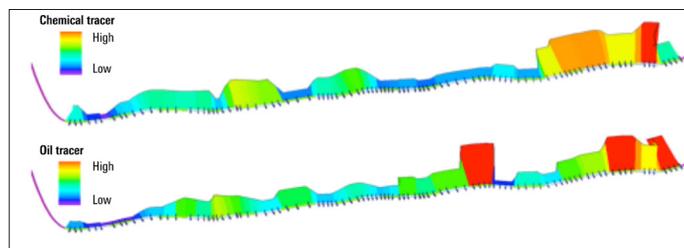
Stimulation cost and performance prompt design review

Manti Tarka Permian developed several wells in the Wolfcamp Formation using standardized stimulation designs, including a nanosurfactant additive purported to improve fracture flowback in the shale. Although the stimulation results met initial expectations, company engineers thought there was room for improvements in completion efficiency and performance. For example, engineers were concerned about the value of the nanosurfactant, which accounted for approximately 25% of the stimulation cost. In addition, chemical tracers indicated that some stages were not contributing to production. As a result, the operator asked for an engineering study to optimize the completion design for subsequent wells.

Integrated approach considers models, results, and lab tests

Schlumberger recommended an integrated seismic-to-stimulation workflow to model the reservoir and optimize the completion strategy. The workflow, based on Kinetix Shale software, was applied to an existing horizontal well in three steps: modeling the hydraulic fracture systems created during an earlier stimulation operation; matching the model to actual production response; and using the data with additional laboratory test results to engineer an optimal perforation, completion, and stimulation design for the next well.

To optimize surfactant selection, ShalePrime service was used on a small sample of reservoir rock to assess intrinsic rock-fluid interactions for incompatibilities that might degrade flowback and production performance.



After the optimized stimulation and completion operations, oil and chemical tracers indicated that all stages were flowing and contributing to production.

Oil production increases, and stimulation costs drop

For the Manti Tarka Permian well, the ShalePrime service determined that the nanosurfactant hampered fracture cleanup, rather than improving it. Another surfactant was identified as a better option, and a new clay stabilizer was also identified to better protect the reservoir rock from clay swelling. In fact, further analysis determined that mineralogy and clay content varied predictably from heel to toe, so engineers could design customized additive concentrations for each stage.

The engineers also developed a new pump schedule to improve proppant transport and create a larger fracture surface area. Among the design changes, the engineers recommended an engineered perforation design rather than the geometric designs of the prior well, as well as changes in proppant size, pump rates, and fracturing fluids.

The new design was integrated into the optimized completion strategy and executed as a OneStim service for a horizontal well in the Wolfcamp Formation. The optimized fluid recommendation contributed to reducing the completion cost by 25%. After one year, the optimized well's cumulative production was 70% higher compared with production from a comparable offset well completed using the older design.