AccessFrac® Stimulation Service Increases Well Production

IMPROVING CLUSTER EFFICIENCY IMPROVES WELL PRODUCTIVITY ON MULTI-WELL FIELD STUDY

PERMIAN BASIN, TEXAS

OVERVIEW

A major operator in the Permian Basin called on Halliburton to utilize our AccessFrac® stimulation service and SPECTRUM™ real-time coiled tubing services in order to help improve and validate cluster efficiency. SPECTRUM service was used on multiple wells to validate the production improvements and cluster efficiency, the Halliburton’s AccessFrac Service was applied. AccessFrac Service has shown a substantial reduction of the overall well bashing. Further wells treated with AccessFrac service have shown a 33 percent increase in productivity as compared to offset wells.

CHALLENGE

A major operator in the Permian Basin was drilling and completing wells in the Spraberry formation. The operator had ongoing well bashing issues as the communication was established between the infill and existing wells during the stimulation treatments. This was creating production problems. The existing wells were losing substantial amounts of production for several months before the wells recovered as infill wells were completed. Some wells did not even return to full production after a year of recovery time. The customer challenged Halliburton to help resolve the well bashing issue. The customer’s theory was that the bashing was strictly a well spacing issue. Initially, the customer asked Halliburton to help define fracture lengths so that well spacing could be optimized, resulting in substantially reduced well bashing. While the client was satisfied that the production was adequate, the company is continually looking for opportunities to improve on production vs. total potential reserves for the Spraberry interval. While well bashing was the primary issue, cluster efficiency was part of the bigger problem. Balancing the fluid and proppant flow in the fracture network would not only achieve greater cluster efficiency but could also help with the ongoing well bashing issues in the field. However, achieving this was the first challenge. The second challenge was proving that the treatment was actually improving the cluster efficiency and mitigating the well bashing issues.

SOLUTIONS

To mitigate the well bashing, Halliburton designed a targeted approach that included AccessFrac stimulation service, which uses chemical diversion technology to enable multiple zones or sets of perforations to be stimulated without mechanical intervention. This stimulation service results in effective flow constraint, resulting in stimulating cluster bridging. This is induced in the near-wellbore region of a fracture, and flow is diverted into new unstimulated cluster zones. The process achieves higher cluster efficiency, which results in increased stimulated reservoir volume. This cluster efficiency will allow a more balanced approach for the fracture wings. Better balance of the treatment in the reservoir helped mitigate the ongoing well bashing issues.
The second step of the challenge was proving that the treatment was improving cluster efficiency. To validate the cluster efficiency, SPECTRUM services provided visibility downhole, allowing the engineer to determine how many clusters had actually opened up during the treatment and, thus, enabling the measurement of cluster efficiency.

### RESULTS

Two wells were completed using the AccessFrac stimulation service. After 12 months of production, the AccessFrac treated wells showed a 77 percent increase in cumulative production normalized by lateral length as compared to the conventional designs, Figure 3. This increase in production represents an additional 34,000 bbl of oil or USD 1,700,000. This improved production came at a 56 percent lower cost per BOE for the operator, Figure 4. Further, utilizing these new completion methods have substantially reduced the bashing that has been occurring in the past.

*Initial clean up and production* came back stronger with higher flowback pressures when compared to the surrounding wells.