



CASE STUDY

Optimizing Frac Techniques to Enhance Oil and Gas Production

Applying Practical Frac Engineering Techniques Reduces Bridging and Improves Limited Entry Diversion Resulting In An Increase in Oil & Gas Production on a San Andres Well in the Permian.

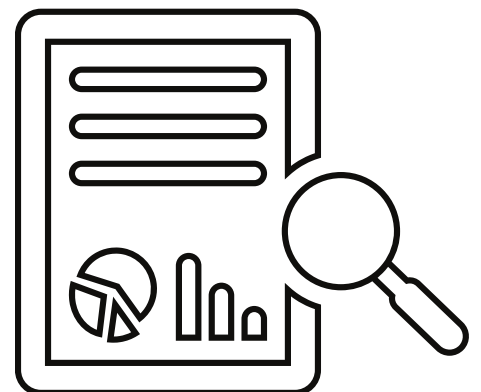
THE CHALLENGE

Bridging during fracs resulted in frac operations being cut short and improper perforation strategies led to poor effective half-lengths adversely impacting oil and gas production.

THE APPROACH

IPT frac engineers conducted a review of the client’s legacy fracs and associated production results.

These were compared to different frac engineering designs and associated lessons learned based on IPT’s regional knowledge of other frac operations targeting the San Andres formation in the Central Basin Platform.



THE SOLUTION

IPT frac engineers provided the following recommendations to the client:

1. Adjust perforation shot size (EHD) and hole count to improve diversion effectiveness based on sound limited entry principles.
2. Increase crosslinked gel loading to improve proppant placement to optimize lateral proppant distribution (fracture half-length).
3. Trial the use of non-corrosive "green acid" for potential improved operational efficiency through reduced total stage time.

THE RESULTS

IPT's frac engineering recommendations were implemented on the operators most recent San Andres completion. There were no issues initiating the treatments through the perforation friction driven limited entry perf scheme.

This modified perforation scheme resulted in higher confidence of effective diversion and subsequent stimulation of the individual clusters. Increasing the gel loading increased the peak viscosity of the fluid to a level sufficient to generate the additional fracture width necessary to mitigate proppant bridging. Review of the operator's legacy treatments showed bridging in ~25% of the fraced stages, no fluid related bridging was observed in the recent operations..

Following the treatments, the Pump Intake Pressure (PIP) on the Electrical Submerged Pump (ESP) was higher in new well than previously measured on offset wells. Higher pressure and lower decline rate are an indication of improved fracture half length. The "green acid" trial was successful and proved to be effective compared to standard HCL acid giving the operator confidence in future applications to improve operational efficiency.

Overall oil and gas production improved from previous fracs using IPT's engineering recommendations and additional operational savings may be realized on future treatments.

ABOUT IPT WELL SOLUTIONS

IPT Well Solutions is an independent engineering consulting and wellsite supervision firm in business for 30 years. We serve clients in oil and gas, municipal and industrial wastewater, and carbon capture & storage.