

## QUANTUM PROPPANT BY GEOSPLIT IMPROVED PRODUCTION OPTIMIZATION

### CHALLENGE

One of the major Russian Oil and Gas company has faced up with a complexity of well production analysis after multi stage fracturing operations in long horizontal wells. Inability to improve fracturing operations and to evaluate them properly led up to uncertainty of frac designs and therefore well production optimization. *Such challenge was also followed with client's request to provide innovative solution that doesn't require Mfrac port modification, and therefore rerunning of the existing completion.*

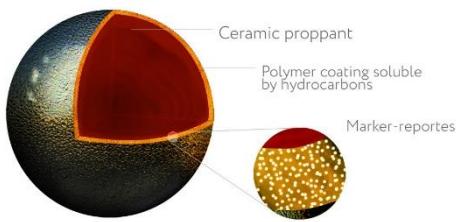


Figure 1 - Marked polymer-coated proppant

### SOLUTION

GEOSPLIT was able to offer to a client best and cost-effective solution. It's based on unique GEOSPLIT marked proppant (Quantum Proppant) with Quantum dots (Figure 1) providing separate signatures for each stage. Marked proppant was pumped during fracturing operation and placed in five different stages. Analytical complex GEOSPLIT along with specifically developed software has provided to our client exclusive data that resulted in significant production increase.

### APPLICATION

GEOSPLIT «Quantum proppant» was pumped into formation during five stages fracturing operation according to original job design. As per operator's company request well was shut in for 48 hours for pressure build up. Once certain pressure achieved well was opened to the production line. Production fluid samples were taken at the surface to be analyzed and the results modeled. Each colored markers showed equal concentration of the GEOSPLIT Quantum proppant installed in each stages.

GEOSPLIT developed specific sampling program according to which 24 samples bottles were collected and delivered to its lab. In order to confirm effectiveness of the technology of Quantum Proppant customer has also required his own participation in GEOSPLIT lab for evaluating samples and to insure clarity of current work. After completing certain laboratory test GEOSPLIT software simulations were run to determine the production distribution across pay zones. According to received results zone 1, 2 and 3 showed higher oil production where zone 4 and 5 showed high water cut.

### RESULTS

Once final analysis was completed client was able to see exact contribution of each zone after frac operations shown in Figure 2 Using GEOSPLIT Quantum proppant verify frac job effectiveness Operator optimizes fracturing strategy and reviewed overall production technique. Quantum markers-reporters has remained in the formation to provide relevant and most efficient information of contribution in production zones for extended period of time.

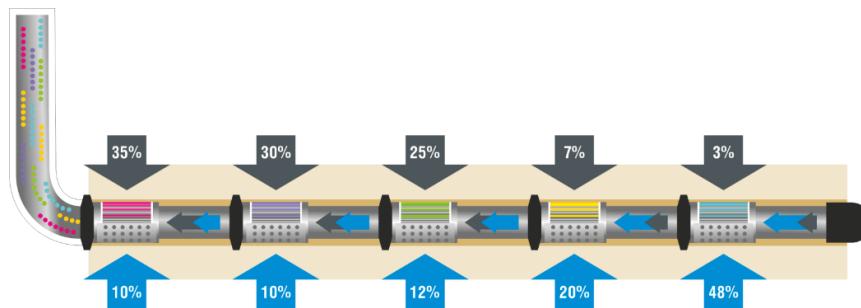


Figure 2 – Zones contribution results

According to this trial job operator reevaluated its reservoir models and improved its drilling and completion strategy for future wells in the field. Moreover, *first of a kind operation was completed with close cooperation between customer and GEOSPLIT.* Results could be summarized as followed:

- Frac operation design jointly completed between customer and GEOSPLIT
- First trial operation completed in multistage frac well using GEOSPLIT Quantum proppant
- Customer confirmed Quantum proppant technology operational and cost-effectiveness
- GEOSPLIT provided final report representing all five zones contribution
- GEOSPLIT provided recommendations for production optimization
- Customer improved completion and stimulation techniques based on this study