



Case Study: Permian, United States

King™ Frac Plug – Time and Cost Savings due to Pump Down Speed and Mill Out

Challenge:

An operator with a three well pad running 4.5” Frac Plugs out in the Permian was looking to increase their pump down speed and mill out efficiencies in some upcoming wells. The operator was specifically looking for ways to save cost by running frac plugs that had the option of running a ball-in-place, has the ability to run-in at high speeds while minimizing fluid use, and the ease of drill outs.

Solution:

The customer opted to install a total of 132 King™ Frac Plugs using Royals Easy Connect WLAK and E4-#10 Setting Tool. Advanced design features of the plug allowed for speeds in excess of 1,000 ft/min with an average speed of 750 ft/min while using minimum amounts of pump down fluid due the use of a pump down kit. The wells were completed without incident, and all King™ plugs were drilled out in a single run, with no motor stalls or short trips needed and drill out averaging 4.36 min per plug. All plug debris from the plugs were small from start to finish.

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Well Specification

- 4.5” - 13.5 lb/ft Casing
- ~7,300 ft Lateral Length
- ~11,800 ft TVD
- ~9,000 psi Max Frac Pressure
- 240°F

Results:

- Ball-in place option
 - Average fluid savings of 55 bbls per stage
 - Average time savings of 5+ minutes per stage
- Time and cost savings on pump down
 - Average speed of over 750 ft/min preventing Frac crew from waiting on WL and Plug
- Time and cost savings on mill outs
 - Limited use of chemicals for debris flow back
 - Zero short trips required
 - No motor stalls

