Case study: Niobrara, Colorado

Versa-Drive milling service milled 175 frac plugs, saved 40 hours, $250,000

A customer in Colorado drilled and completed a pad in the Niobrara formation with four wells and 5½-in. casing. The laterals were 2-mile horizontals and plugged and perforated with a total of 175 composite frac plugs. The most in one well was 47 plugs. After successfully fracking, Baker Hughes was called to conduct the final drillout in an efficient and reliable manner.

To mill out the composite plugs, Baker Hughes proposed the **Versa-Drive™ plug milling service** which leverages a full kit of fit-for-purpose tools backed by accurate modeling to get to total depth (TD) in smooth, single-trip runs, reliably and cost effectively. The bottomhole assembly (BHA) featured a $4^{5}/_{8}$-in. **Vanguard™ rock bit**. The Vanguard bit is designed specifically for plug milling applications. Its self-sharpening steel teeth and increased tooth count increase rates of penetration.

Other components of the BHA consisted of a $3^{3}/_{8}$-in. **Navi-Drill™ Ultra™ Series workover motor**, the **Hydropull extended reach tool**, a water bypass sub, a hydraulic disconnect, a dual flapper back pressure valve, and a coil connector. The Ultra motor is extremely durable and reliable, and is capable of generating exceptional power for extended milling operations.

The Versa-Drive BHA was deployed and all four wells were successfully milled out in single runs. The average mill times were 4 minutes with a flow rate 5.25 bpm. The entire operation encountered only a single stall. By using the Versa-Drive plug milling service, the customer saved 40 hours per well and approximately $250,000 USD.

With Baker Hughes and it's ability to reach final depth reliably, the customer changed from dissolvable to less expensive composite plugs.

Challenges

- Mill 175 composite frac plugs from 4 wells

Results

- Saved 40 hours per well from not conducting second trip
- Realized a total savings of $250,000