



Weatherford®

REAL RESULTS

Four-Well Program Using Ultradeep Performance Drilling Application Increases ROP Almost Threefold

Objectives

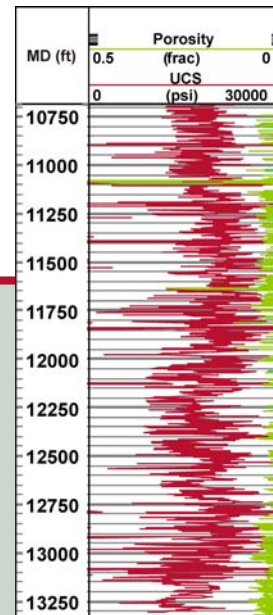
- Increase the rate of penetration (ROP) on four ultradeep, high-temperature wells in a highly abrasive and compressive formation by using lightweight drilling fluids, such as air, nitrogen, or mist-foam as the circulating medium.
- Use hammer bits and tricone bits below 10,000 ft (3,048 m) with temperatures in excess of 300°F (149°C).
- Reduce the number of bits required to drill the section.

Results

- A total of 11,125 ft (3,391 m) was drilled. The first three wells achieved an average ROP of 45 ft/hr, using a combination of hammer bits and tricone bits. The fourth well was drilled using just tricone bits at an average ROP of 40 ft/hr. Average ROP when drilling conventionally at a comparable depth in this section was 15 ft/hr—an ROP almost 300 percent less than what was achieved with performance drilling techniques.
- Nitrogen or air was injected at approximately 3,200 scf/m with FMA-100 multipurpose drilling surfactant and Triplex™ high-temperature corrosion inhibitor. Approximately 15 gal/min of water was also injected when a mist-foam system was used.
- During bit trips, planned foam sweeps were performed to dry the hole and enable performance drilling to recommence without any safety or performance issues.

Value to Client

- The operator was able to use at least two fewer bits per well. Additional costs for equipment and hammer bits were offset by fewer days on location, reductions in bits used, lower drilling mud costs, and bringing wells to production sooner.
- The unloading operation before drilling began was safe and stable despite being performed at depths in excess of 10,000 ft (3,048 m).



This log from one of the wells reflect the high compression strength of the Travis Peak formation, which is one of the hardest, most abrasive, and difficult formations in the world to drill.

Location

Bald Prairie, Texas, USA

Formation

Travis Peak-Sandstone

Number of Wells

4

Hole Size and Angle

8-1/2 in., vertical

Casing Size

9-5/8 in.

Depth

- Start: +/-10,000 ft (+/-3,048 m)
- Finish: +/-13,400 ft (+/-4,084 m)

Fluid System

Single-phase air or nitrogen followed by a mist-foam system

Products/Services

- Controlled Pressure Drilling® services
- On-site nitrogen production unit, compressors, boosters, and data-acquisition system
- FMA-100 multipurpose drilling surfactant
- Triplex high-temperature corrosion inhibitor