

Multiple Wells Drilled with Star Shield® Wellbore Shielding Solution in the Delaware Basin

Reeves County, Texas – Delaware Basin

CHALLENGE:

- ▶ Saltwater influx due to injector wells
- ▶ Mechanically weak formations
- ▶ Narrow mud window limiting mud weights to 9.4 to 9.6 lb/gal

SOLUTION:

- ▶ 4-8 lb/bbl Star Shield technology added to the salt-saturated WBM

RESULT:

- ▶ Mitigated wellbore instability
- ▶ Permitted an increase in mud weight to 10.8 lb/gal without breaking the formation
- ▶ Controlled the salt water influx in the intermediate interval



CHALLENGE

Offset well data in the Delaware Basin indicated the need for one Operator to extend the mud weight window in the 12¼-in. intermediate hole section to prevent a saltwater influx due to nearby injector wells. However, the extended mud weights required to hold back this water flow usually lead to substantial lost circulation events and hole instability issues when drilling through the mechanically weak formations below. A narrow window between pore pressure and fracture gradient makes drilling these wells challenging; drilling the intermediate interval with enough mud weight to prevent a fluid influx can induce whole mud losses and wellbore instability.

SOLUTION

The operator used Star Shield wellbore shielding additive in the past and adopted the technology across multiple wells for this application. The Star Shield additive was mixed into the water-based drilling fluid system at 5,000 ft. and maintained in the system while drilling through the Cherry, Brushy Canyon, and Avalon formations to approximately 8,500 ft. to mitigate the anticipated whole mud losses and wellbore instability issues. Offset wells in this area are traditionally drilled with 9.4- to 9.6-lb/gal saturated salt water-based drilling fluid (WBM); however while utilizing Star Shield wellbore shielding technology, mud weights as high as 10.8 lb/gal were achieved on multiple wells without whole mud losses.

RESULT

Star Shield wellbore shielding additive successfully prevented significant lost circulation and hole instability events with mud weights as high as 10.8 lb/gal on multiple wells across several wells in the Delaware Basin. Out of 18 wells in this area to date using Star Shield technology, only two wells have experienced lost circulation. When a fracture larger than the sealing capabilities of Star Shield wellbore shielding additive was encountered in these two wells, all additions of Star Shield technology were halted, and several conventional LCM sweeps were pumped downhole in an attempt to heal the losses. The sweeps were successful. The operator continues to use Star Shield wellbore shielding additive in this region as a proven technology to mitigate the narrow drilling windows and control well instability and mud losses.