

Operator uses HydraGlyde and MPD Systems to Mitigate Swelling and Lost Circulation, Siberia Ridge

HydraGlyde high-performance water-based drilling fluid system enables successful mitigation of drilling complications in unconventional wells, onshore

CHALLENGE

- Mitigate wellbore swelling, torque, and lost circulation in unconventional wells using a water-based mud.
- Drill both intermediate and lateral sections with the same type of mud.

SOLUTION

- Use the HydraGlyde* high-performance water-based drilling fluid system consisting of the HydraHib* shale inhibitor, HydraCap* encapsulating additive, and HydraSpeed* ROP-enhancing primary lubricant to enable drilling as planned.
- Used MPD system to mitigate ballooning, early kick detection, and formation fingerprinting.

RESULTS

- Mitigated wellbore swelling and enabled easier first pull out of hole in the intermediate section.
- Lowered wellbore risks caused by bit balling and BHA and drillstring packoff.
- Landed casings without significant time reaming or washing down.



Prevent or mitigate severe lost circulation and wellbore swelling and ballooning

Historically in the US Land Rocky Mountains, an operator consistently experienced difficulties while tripping out of hole through the upper 5,000 ft [1,524 m] of several wells in the 8³/₄-in intermediate section. During this time, the operator drilled using a conventional gel and polymer drilling fluid. This made the illite, kaolinite, and smectite in the formation prone to swelling, ballooning, and high torque and drag, causing severe lost circulation. Occasionally, high torque and drag was observed while drilling the 3,000–5,000-ft [914–1,524-m] 6¹/₈-in lateral section as well. Consequently, the operator needed a way to mitigate this ballooning and swelling while also reducing torque and drag downhole.

Use the HydraGlyde system to offer multiple shale inhibition mechanism

A tailored HydraGlyde system was chosen to drill both the 8³/₄-in intermediate and 6¹/₈-in lateral sections. The system was customized in such way as to balance the technical requirements for each interval while maintaining the cost at a minimum. The upper section of the intermediate hole, from surface shoe to 6,500 ft [1,981 m], was drilled with slick, inhibited water—with the HydraHib inhibitor and HydraSpeed lubricant only. Below 6,500 ft [1,981 m], the entire curve to TD was drilled using the HydraGlyde system.

In the 8³/₄-in section, the HydraGlyde system was engineered to manage the reactive shale, in combination with the HydraHib inhibitor and HydraCap additive. The HydraGlyde system used these as a multiple inhibition mechanism; the HydraHib inhibitor was used as the primary inhibitor, and the HydraCap additive was used as the encapsulating polymer. For the lateral section, the shale inhibitors were allowed to deplete while the HydraSpeed lubricant was deployed to reduce torque and drag. An MPD system was also employed to help manage wellbore ballooning and mitigate lost circulation.

Drilled well to TD without significant time spent reaming or washing down

The combination of the HydraGlyde system and the HydraHib inhibitor, HydraCap additive, HydraSpeed lubricant, and the MPD system enabled the operator to successfully mitigate the expected drilling complications; they were able to drill to interval TDs and land surface casing, intermediate casing, and production liner without any significant time spent reaming or washing down.

To date, the operator has successfully drilled twelve wells using the HydraGlyde system, including four laterals in conjunction with an MPD system.



The HydraGlyde system underwent laboratory testing to tailor it to fit application requirements.