HydraGlyde System Mitigates Wellbore Stability Issues, Oriente Basin

High-performance water-based drilling fluid system enables drilling three wells in less than 3 weeks, onshore Ecuador

CHALLENGE
- Mitigate potential wellbore instability issues.
- Pull out of hole faster.
- Run liner and casing effectively in three wells.

SOLUTION
- Use the HydraGlyde* high-performance water-based drilling fluid system to provide the same benefits as an oil-based fluid system.

RESULTS
- Drilled three wells to TD without wellbore instability issues.
- Set records for faster pulling out of hole and setting-casing speeds.

Overcome wellbore stability and casing difficulties while drilling three wells
An operator wanted to drill the intermediate and reservoir sections (12¾- and 8½-in sections) of three wells in the Orient Basin of Ecuador. However, the reactive shales and clays in the lateral section cause torque and motor issues, leading to high risk while drilling the conglomerates. In addition to these challenges, it was difficult to pull out of hole due to excessive backreaming, and it was impossible to run casing without taking excessive time to do so. In the reservoir section, the operator experienced inordinate washout into interbedded shales of the Napo Formation, casing difficulties during logging operations and while running the liner.

The primary need was to minimize the potential problems related to wellbore instability in the area.

Use the HydraGlyde system to mimic oil-based mud
M-I SWACO, a Schlumberger company, proposed replacing the operator’s current water-based mud system with the HydraGlyde system. It is a unique shale-play drilling fluid that mimics oil-based mud in terms of penetration rates and wellbore stability—which helping operators minimize environmental impact and save on dilution and disposal costs.

For this application, the HydraGlyde system was engineered with a low-solids formulation consisting of 10.0–10.4 lbm/galUS [1.2–1.25 sg] weighted with calcium carbonate. After the intermediate 13¾-in casing was set, the HydraGlyde system was used to drill the 12¾- and 8½-in intervals.

Drilled all three wells in less than three weeks with minimal stability or liner issues
Using the HydraGlyde system, the three directional wells were drilled to TD according to AFE without well stability issues in the 12¾- and 8½-in sections. In the 12¾-in section, the velocity when pulling out of hole was above 561 ft/h [171 m/h], demonstrating very good inhibition and lubricity properties for the interval while setting a field record. The setting-casing speed was above 482 ft/h [160.6 m/h] for the three wells, also setting a field record. The liner and logging runs in the 8½-in section were completed without issues.

The three wells were drilled in less than 3 weeks. The operator was highly satisfied with the performance of the HydraGlyde system, creating opportunities to use the system in upcoming wells in the area.