HORIZONTAL OIL SAND WELL POSES HIGH RISK OF EXCESSIVE TORQUE AND STUCK PIPE

The operator wanted to optimize drilling efficiency in the surface, intermediate, and production intervals of a horizontal heavy oil well. The planned total depth (TD) was 4,258 feet (1,298 meters) true vertical depth (TVD) and 6,797 feet (2,072 meters) measured depth (MD). The goal was to minimize nonproductive time (NPT) related to poor hole cleaning, stuck pipe, high torque, reactive clays, and oil sand accretion on the drillstring.

In addition to providing engineered fluid systems to meet hole conditions, the Baroid team planned to use Drilling Fluids Graphics (DFG™) hydraulics modeling software not only to mitigate any problems encountered, but also to predict and avoid issues by monitoring trends and making on-the-fly modifications to drilling parameters.

CHALLENGES

» High risk of swelling clays
» Excessive torque leading to stuck pipe
» Oil sand accretion on the BHA

SOLUTIONS

The Baroid team targeted drilling issues with an engineered fluid. This solution included:

» BaraSure™ W-674 shale stabilizer to inhibit swelling clays
» EZ GLIDE™ lubricant to prevent high torque in the lateral
» DFG™ hydraulics modeling software to support real-time changes to critical drilling parameters

RESULTS

» Tailored fluid solution enabled operator to drill well several days faster than offset wells, setting a field record for fastest drilling time
» Saved operator more than USD 100,000 in avoided rig days and fluid costs

CUSTOMIZED FLUID WITH SHALE STABILIZER HELPS OPERATOR SAVE MORE THAN USD 100,000

LATIN AMERICA

BaraSure™ W-674 Shale Stabilizer Stops Clay Swelling and High Torque in Oil Sand Lateral

CUSTOMIZED FLUID WITH SHALE STABILIZER HELPS SET FIELD RECORD FOR FASTEST DRILLING

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CUSTOMIZED FLUID WITH SHALE STABILIZER PREVENTS CLAY SWELLING

The Baroid team designed a technical proposal that would adapt to the challenges for each phase. The proposed program included proven fluid formulations that would inhibit the swelling clays, minimize torque, and prevent accretion on the bottomhole assembly (BHA).
To meet these goals, the fluid’s polymeric inhibitors included 70 ppb of BaraSure™ W-674 shale stabilizer, which is completely water soluble; environmentally acceptable; and effective in freshwater, seawater, low-solids or weighted systems.

The BARADRIL-N® reservoir drilling fluid was treated with 3 percent v/v EZ GLIDE™ lubricant to prevent excessive torque and accretion issues.

**TAILORED FLUID SOLUTION CONTRIBUTS TO FASTEST DRILLING TIME IN FIELD TO DATE**

The well was drilled to 4,258 feet (1,298 meters) TVD/6,797 feet (2,072 meters) MD with no operational problems. Operational time was reduced by several days compared to offset wells, where stuck-pipe incidents had required lengthy fishing operations.

The planned drilling time was 17.2 days. The actual time was 15.5 days, making it the fastest well drilled by the operator during the project. Zero NPT was attributed to fluids. The time vs. depth plot shows drilling performance compared to the well plan and the impacts of NPT from other sources.

Savings were estimated at USD 12,000 per day for rig costs (up to USD 60,000 compared to some nearby wells), and fluid reuse/recycling saved an additional USD 75,000.

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