

CONTINENTAL RESOURCES CUTS MUD COSTS 40% WHILE DRILLING IN REACTIVE, HIGH-TEMPERATURE FORMATION

HydraGlyde high-performance water-based fluid system improves ROP while reducing HSE risk and fluid costs in STACK shale play

CHALLENGE

Drilling the 8 3/4-in production interval using water-base drilling fluid instead of oil-base mud in high-temperature formation with frequent wellbore stability and torque issues.

SOLUTION

Use HydraGlyde* high-performance water-base drilling fluid system to provide high penetration rates and wellbore stability while reducing environmental impact and fluid costs.

RESULTS

- Reduced cost per barrel of drilling fluid by 40% compared with oil-base mud.
- Eliminated waste transportation and disposal cost.
- Drilled the 8 3/4-in section, which included a vertical, curve, and lateral, to 14,368 ft with in BHA.
- Ran casing in the entire 12,932-ft interval with no issues.

CUT DRILLING COSTS WITHOUT COMPROMISING PERFORMANCE

The target formation in central Oklahoma's oil-rich STACK play contains high-temperature shales that swell on contact with conventional water-base drilling fluids, contributing to slower rate penetration and frequent torque issues. To overcome the challenges of drilling long laterals through these reactive shale formation, area operations typically use oil-base mud. While oil-base mud provides wellbore stability and high ROP, it also contributes to higher disposal costs and health, safety, and environmental risks.

After using oil-base mud in previous wells, Continental Resources challenged M-I SWACO to provide a water-base fluid system that would meet drilling objectives in a 9,778-ft lateral with temperatures up to 300 degF and density up to 14.8ppg.

ENGINEERING A HIGH-PERFORMANCE WATER-BASE MUD

After performing intensive shale inhibition and lubricity testing on cuttings taken from offset wells, M-I SWACO recommended the HydraGlyde high-performance water-base drilling fluid system, which consists of the HydraSpeed* ROP-enhancing primary lubricant, HydraHib* shale inhibitor, and the HydraCap* encapsulating additive. Hot roll dispersion lab testing and lubricity testing showed lubricity and shale inhibition comparable to oil-base mud.

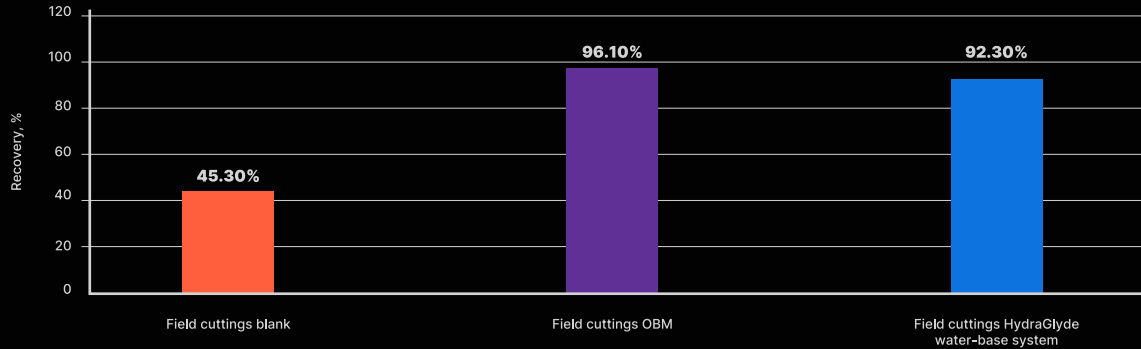
To increase thermal stability, the M-I SWACO team engineered the HydraGlyde system using a base of 20-wt% sodium chloride brine and 2-lbm/bbl PTS-200* polymer temperature stabilizer.

REDUCING DRILLING FLUID COSTS BY 40%

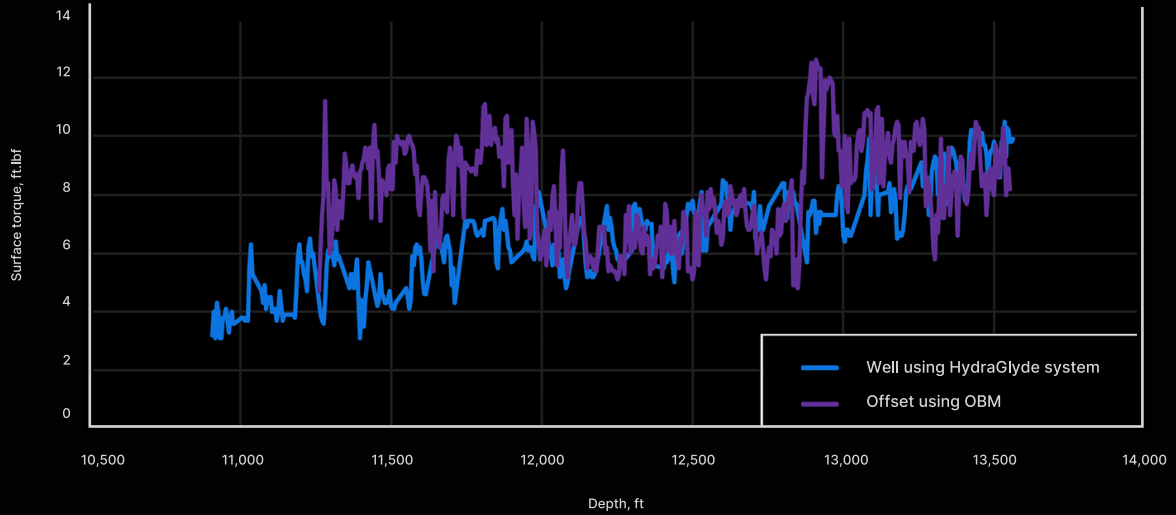
After the 9 5/8-in casing was set, Continental Resources used the HydraGlyde system to drill the entire 8 3/4-in section consisting of the vertical, curve, and lateral. The operator drilled the 12,932-ft interval with higher ROP and reduced drilling torque compared with the ROP and torque of a nearby well. In addition to improved operational performance, the HydraGlyde system mitigated environmental impact while contributing to higher cost savings. By eliminating the transportation, dilution, and disposal cost associated with oil-base mud, Continental Resources cut drilling fluid costs by 40%.



Clay Hot-Rolled Dispersion



Dispersion testing demonstrates how the water-base HydraGlyde drilling fluid system delivers performance comparable to that of an oil-base mud.



Lower surface torque was recorded in the well using HydraGlyde system versus oil-base mud used in offset well.