



## Drilling Fluids Solutions

# BARADRIL-N® reservoir drill-in fluid (RDF-615) helps operator achieve successful screen installation and save five days of rig time

Location: Tinat Field, Saudi Arabia

### Overview

The operator needed to drill a 5 7/8-in. hole through the Unayzah-A reservoir in the Tinat field to a total depth (TD) of 16,980 ft (15,350 ft of true vertical depth). Wellbore angle would build from 68° to a maximum of 85° and hold at that maximum until reaching TD. An 826-psi overbalance was expected in this interval. A mesh screen completion was planned.

Prior to this, other wells in the Tinat field had been drilled with costly formate-based fluids. For example, the 5 7/8-in. reservoir section of one offset well, located 4 km from the proposed well, was drilled directionally with a potassium formate system. While tripping in the hole to run the completion screen at 15,974 ft, the driller had to ream to bottom. Due to hole instability problems, the drilling team was able to pull only two stands of pipe without rotation and had to increase the mud weight to 89 pcf.

Other offset wells exhibited similar problems: difficulty getting screens to bottom and/or finding screens plugged with solids and polymer additives.

CHALLENGE	SOLUTION	RESULT
On offset wells, completion screens could not be installed successfully in the deep gas Unayzah-A reservoir, even though premium formate drilling fluids were used.	Baroid personnel proposed replacing the formate system with BARADRIL-N® reservoir drill-in fluid.	The completion screens were installed successfully in the deep reservoir, and five days of rig time were saved.

### Halliburton's Solution

The Baroid technical team recommended drilling the Unayzah-A formation with BARADRIL-N® reservoir drill-in fluid (also known as RDF-615). This fluid is designed to help protect the formation and provide effective acid-soluble bridging that minimizes losses and reduces the risk of differential sticking.

The 68-pcf BARADRIL-N system was formulated as follows:

- BARABUF® pH buffer for alkalinity
- N-DRIL™ HT PLUS filtration control agent
- BARAZAN® D PLUS viscosifier
- OXYGON™ non-sulfite oxygen scavenger
- BAROLUBE® GOLD SEAL lubricant
- Sized BARACARB® 5, 25, and 50 ground-marble bridging material

**\$200K**  
**SAVED**  
 IN RIG TIME

The hole was drilled with no issues to section TD at 16,980 ft, where a wiper trip was performed. No tight spots were encountered. After a final reaming trip, the operator successfully ran a 4 1/2-in. completion mesh screen to bottom.

The successful outcome was attributed to the use of the BARADRIL-N system, and to careful fluid management at the rigsite. Target mud properties were determined through lab testing. DFG™ hydraulics modeling software was used onsite daily to help achieve effective hole cleaning by optimizing pump rate, sweep frequency, and rate of penetration.

### **Economic Value Created**

Using the engineered BARADRIL-N fluid helped the operator save five days of rig time (at US\$40,000/day). The completion screen was installed at TD per plan with no issues. As a result, the operator awarded additional wells to be drilled with the cost-saving reservoir drilling fluid system.