

“The client knew that drilling through a faulted zone would incur losses and was concerned about how to cost effectively reduce them. Using the DRILPLEX system successfully achieved this objective.”*

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Well Information

Location..... Onshore UK
 Spud..... June 2002
 Hole Size 12¼-in.
 Interval Length.....858 m (2,815 ft)

The Situation

Previous wells drilled from the same pad using the same rig had incurred losses of over 7,500 bbl across a suspected fault zone using a gel-CMC fluid. It was imperative that losses be reduced on subsequent wells. Challenges existed because sequences of dispersive and swelling claystone were mixed within the section.

The Solution

The loss control healing properties of the DRILPLEX system led M-I SWACO to propose using it to drill this section.

The Results

- The primary objective of drilling to TD was successfully achieved.
- Whole mud losses to the fracture zone were reduced to 857 bbl of DRILPLEX solution including the high-viscosity lost-circulation pills before the fracture stabilized.
- The potentially reactive claystone formations remained stable and open for 11 days until cased and cemented. Hole problems directly relating to these formations were minimal.
- The essential DRILPLEX rheological properties of elevated 6 and 3 readings, low plastic viscosity, and high yield point were evident throughout the section despite excessive contamination from cement, high pH, high calcium levels (from cement, anhydrite and aquifer water) and low gravity solids.
- The DRILPLEX system was proved. Both shakers were dressed with 200-mesh screens that successfully removed much of the cuttings on the first pass and prevented further circulation and degradation of low-gravity solids in the system.
- There were no hole-cleaning problems reported while drilling the section.
- The material cost for the section was 20% under plan.



The Details

The DRILPLEX formulation used for the section was as follows:

PRODUCT CONCENTRATION	
Fresh water, bbl	0.97
M-I GEL* SUPREME, lb/bbl	10
Caustic soda, lb/bbl	0.125
Soda ash, lb/bbl	0.125
DRILPLEX, lb/bbl	1.0
FLO-PLEX*, lb/bbl	4.0
HIBTROL*, lb/bbl	1.0
KCl, lb/bbl	5.0
SAFE-CARB*, lb/bbl	5.0

PROPERTIES	
Mud Weight, lb/gal	9.0
Yield Point, lb/100 ft ²	20-30
6 rpm / 3 rpm / 10 sec Gel	18-30
API Fluid Loss, mL/30min	8-10
pH	10.5-11

The DRILPLEX system successfully drilled through to the fracture zone, where losses of 17 bbl/hr were incurred. Losses gradually increased to 60 bbl/hr while drilling to 746 m (2,448 ft). The first high-viscosity DRILPLEX pill was formulated with a 6 & 3 dial reading of 85 Fann Units. Pumping the pill controlled the losses, but by 749 m (2,457 ft), losses had increased to 300 bbl/hr. Reserve fluid was pumped, effectively reducing loss to 60 bbl/hr. At a depth of 775 m (2,543 ft), losses had again increased, necessitating a second high-viscosity DRILPLEX pill containing NUT PLUG* and mica. Drilling began again, stopping at 777 m (2,549 ft) for a rotary assembly and bit change. By this point, an estimated 857 bbl had been lost to the formation.

In order to reach TD at 964 m (3,163 ft), dynamic losses were restricted to less than 5 bbl/hr. By the end of the section seepage losses had accounted for a further 373 bbls. After cementing the section, total losses amounted to 1,230 bbl – 16% of the loss encountered in the offset well.

Questions? We'll be glad to answer them.

If you'd like to know more about the DRILPLEX system and how it's performing for our other customers, please call the M-I SWACO office nearest you.

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