

# Engineered HYDRO-PLUG® Pill Dramatically Cuts Loss Rate in Fractured Limestone

AL MAGD FIELD, WESTERN DESERT, EGYPT

## CHALLENGES

Overcome drilling disruptions caused by total losses in highly fractured limestone formation

## SOLUTION

Engineered LCM pill containing sized particulates and a hydrating chemical sealant

- » Spot 80-bbl across loss zone
- » Apply hesitation squeeze at low pressure for five hours

## RESULTS

- » Dynamic loss rate dropped from 180 bbl/hr to 55 bbl/hr
- » Static loss rate dropped from 120 bbl/hr to 24 bbl/hr
- » Drilling resumed to target TD
- » Eliminated need for sidetrack
- » Operator saved 24 hours of rig time and approximately USD 68,517

## EXCESSIVE LOSS RATE IMPEDES DRILLING IN FRACTURED LIMESTONE

In response to encountering losses of 60 bbl/hr in the Khoman A fractured limestone at 1,780 meters (5,840 feet), Bapetco pumped a 50-bbl lost circulation pill containing 30 lb/bbl of conventional lost circulation material (LCM). This initial treatment had no effect, and, as drilling continued to 1,858 meters (6,096 feet), losses rose to 100 percent (zero returns while drilling).

**HYDRO-PLUG®**  
pill cuts losses  
**SAVES USD 68.5K**

The rig crew tripped and ran back in the wellbore with a slick assembly. A second attempt was made to cure the losses by spotting a 50-bbl pill containing 85 lb/bbl of conventional LCM.

Upon spotting the pill, drilling resumed from 1,858 meters (6,096 feet) to 2,060 meters (6,758 feet), but the average loss rate was 180 bbl/hr. Bapetco was unable to continue drilling to the planned interval total depth (TD).

## HYDRATING LCM PILL APPLIED WITH SQUEEZE RESTORES CIRCULATION

To overcome the disruption in drilling, the Baroid team recommended pumping a customized pill formulated with a chemical sealant and sized particulate LCM.

Specifically, the 80-lb/bbl pill contained the following components:

- » HYDRO-PLUG® hydratable, composite LCM and sealant
- » BAROCARB® 600 sized ground marble
- » BAROFIBRE® seepage loss additive
- » STEELSEAL® sized resilient, dual-composition, carbon-based material

Once the pill was in place across the highly fractured Khoman A limestone, a 50-psi to 150-psi hesitation squeeze was applied for five hours. This allowed the pill to fully hydrate and seal the loss zone.

## OPERATOR REACHES TARGET INTERVAL TD, SAVING 24 HOURS AND US\$ 68,5K

When circulation resumed, the dynamic loss rate dropped from 180 bbl/hr to 55 bbl/hr. Static losses dropped from 120 bbl/hr to 24 bbl/hr.

The operator was able to continue drilling to the target interval TD, with an estimated savings of USD 68,5 that included avoiding a sidetrack, preserving the volume of potassium chloride (KCl) polymer drilling fluid ( $\pm$  8,800 bbl), eliminating the cost of repetitive conventional LCM treatments, and saving 24 hours of rig time.

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