

BaraBlend®-665/BaraLock®-666 LCM Pill Restores Circulation, Supports Successful Cement Plug

COLOMBIA

CHALLENGES

Severe to total losses were encountered throughout the field in a known depleted sandstone that involved:

- » 6-mm fracture widths
- » Multiple unsuccessful cement plugs

SOLUTIONS

A pill containing a blend of BaraBlend®-665 LCM and medium and coarse BaraLock®-666 LCM significantly reduced the loss rate.

RESULTS

Spotting and squeezing the 50-bbl pill created a base for following up with a cement plug, which stopped losses entirely, thus:

- » Saving USD 75,000 in rig time
- » Regaining circulation with only one LCM pill and one cement plug

OVERVIEW

A customer in Colombia experienced severe lost circulation issues when drilling through depleted sandstone. High-volume losses were a known risk in the area due to faulting, and pore pressures ranged between 3.0 ppg and 4.0 ppg.

In the most severe cases, the total mud loss volume reached 20,000 bbl. In addition, up to seven days of nonproductive time (NPT) were associated with attempting to control lost circulation events. The losses occurred in both naturally and induced fractures, with fracture widths up to 8 mm. The image log analysis identified only natural open and closed fractures.

Traditional lost circulation material (LCM) and cross-linked pills had been used with only partial success. When total mud losses continued even after implementing all possible LCM options as defined in the lost circulation decision tree, the next step was pumping cement plugs. However, these plugs were ineffective on previous wells.

LCM BLEND HELPS SEAL 6-MM FRACTURES

The Baroid team recommended spotting a high-fluid-loss pill, formulated with a blend of BaraBlend®-665 LCM and medium and coarse BaraLock®-666 LCM, before pumping a cement plug.

Fresh Water	0.888 bbl
BaraBlend-665 LCM	100 ppb
BaraLock-666.M LCM	0.25 ppb
BaraLock-666.C LCM	0.25 ppb

Final Formulation

Lab testing indicated that this blend could seal fracture widths up to 6 mm, which corresponded to the fracture widths detected by wireline logs on offset wells.

BaraBlend-665 LCM is pre-mixed particulate and reticulated foam in a single sack that effectively remediates losses in any formation, including unconsolidated sand or naturally fractured formations. The supplemental BaraLock-666 LCM is highly compressible foam material available in multiple grades. It can be added to any LCM pill to enhance plugging and eliminate the need for specialty cross-linkable sealants or long synthetic fibers.

When the thief zone location was identified, a 50-bbl pill containing the engineered LCM blend was mixed and squeezed into the formation through a circulating sub. Total control over mud losses was achieved after this squeeze. However, when the drillstring was run in the hole to wash through excess LCM, partial mud losses occurred at a rate of 20–25 bbl/hr.

The operator decided to pump a cement plug, which worked successfully in part due to the support provided by the BaraBlend-665/BaraLock-666 LCM pill. On previous wells, up to five cement plugs had been pumped without success.

RESULTS

Compared to previous wells and loss events, the rig time required to remediate lost circulation was reduced by at least one day, thus saving the operator approximately USD 75,000.

Other costs were also avoided, such as using multiple cement plugs and replacing additional volumes of lost drilling fluid.



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