

WEL-Sure™ Self-Degradable LCM Remediated Total Losses in a Highly Fractured Carbonate Reservoir, Optimized Drilling Operations

Objectives

- Design a non-damaging lost circulation material (LCM) pill based on geomechanics.
- Formulate the appropriate concentration with respect to the provided fracture dimensions.

Our Approach

- Weatherford fluids experts collaborated with the customer to determine the optimal LCM solution to preserve the integrity of the reservoir section. In previous operations, some wells had to be abandoned as they were experiencing total losses and were not able to finish drilling.
- The WEL-Sure self-degradable LCM was recommended not only for its ability to prevent downhole losses of drilling fluids, but also for its capability to 100% dissolve without acid to maintain the integrity of the reservoir.
- Using Weatherford's proprietary modeling software, the pill was optimally designed to bridge and seal the estimated fracture sizes within the wellbore. The WEL-Sure pill included a mixture of both the coarse and fine grades to provide the ideal blend of material sizes and shapes to obtain a quick and efficient seal.
- Although it was not necessary, it was decided to use a cement unit to pump the job. First, 5 bbl of water were pumped followed by 20 bbl of the WEL-Sure pill at 4.2 bpm and 50 psi. It was then displaced with 105 bbl of water at 4.2 bpm and 80 psi.
- The losses were cured via a 20-bbl pill with no dynamic losses being observed after pumping the WEL-Sure LCM.

Value to Customer

- Until Weatherford's WEL-Sure LCM was introduced into the system, the well had experienced a total loss of 167,250 bbl of drilling fluid, of which the 6-in. reservoir section had experienced 9,050 bbl of losses.
- After the LCM pill was pumped, the losses stopped and the well was successfully drilled and completed, unlike other offset wells where losses prevented drilling operations.
- The use of WEL-Sure LCM eliminated additional rig time to remediate losses, a value of approximately \$100,000 USD as well as substantial savings in mud costs.



Weatherford's WEL-Sure LCM eliminates drilling fluid losses and degrades to liquid form over time, avoiding reservoir damage and eliminating the need for secondary operations to remove LCM.

LOCATION

Iraq

WELL TYPE

Onshore, oil

FORMATION

Marly Limestone

NATURAL FRACTURES

3 to 10 mm

HOLE SIZE

6 in.

TEMPERATURE

165 to 170°F (73 to 76°C)

PRESSURE

4,500 psi (31 MPa)

DEPTH

8,136 ft (2,480 m)

PRODUCTS/SERVICES

- WEL-Sure LCM

