



Technical Memorandum Field Application

Subject: Oil Base Mud

Location: Chevron

While drilling below 10,000' at Avery Island, LA., in a directional hole with 37° of angle, returns were lost. A LCM pill composed of Pheno-Seal, Mica and Nut Plug was pumped downhole and partial returns were regained. Torque and drag increased substantially and mud losses were slowed to approximately 8 bbl per hour while pumping at a rate of 7.6 bbl per minute.

Initial drag with the pump on was 100-110,000 lbs over string weight and torque was 580-660 amps. Liquid Casing® was added to 60 bbls of 9.8 ppg oil mud at a concentration of 20 ppb and pumped up the hole approximately 3,000'. As the pill was circulated up the hole, drag decreased to 510-560 amps. Full returns were attained as soon as the Liquid Casing pill reached the thief zone. This pill was pumped down the drill string while a directional drilling mud telemetry tool was in place with no adverse effects and only 300 psi increase over normal pump pressure.

Two days later a low bottom hole pressure sand was drilled and the pipe became differential stuck while making a connection. Fortunately, the pipe became free after 10 hours of jarring.



Normal drilling resumed and torque increased to 720 amps, drag to 110,000 lbs over string weight. A second 60 bbl batch of oil base mud was treated with 30 ppb of Liquid Casing and circulated in the open hole. As the Liquid Casing cleared the bit, again the torque and drag began to decrease, finally stabilizing at 520 amps and 45,000 lbs over string weight.

At this point, an additional 5 ppb of Liquid Casing was added to the entire mud system and no further problems with excessive amounts of torque and drag or differential sticking were encountered.

The hole was logged several times using a Triple Combo tool and no abnormal increase in line tension was noted during logging. The caliper portion of the log also showed the hole to be essentially in gauge. This experience with Liquid Casing points out that not only does it cure lost circulation which has been its primary use but also provides an extremely high degree of lubricity to the borehole and prevents differential sticking. As an added benefit, there were no special precautions or equipment needed to retain this product in the drilling fluid other than replacing the 70 mesh shaker screens in use at the time with 60 mesh screens. Due to the low specific gravity of Liquid Casing (.7), it will not be removed by a mud cleaner, therefore 60 mesh screens were utilized for the duration of the job.