FLOMUL† Water Flow Emulsifier Provides Rapid Restoration of Fluid Properties in Permian Basin

CHALLENGES

Stabilize and restore drilling fluid properties to prevent drilling delays

Minimize treatment levels to lower cost impact

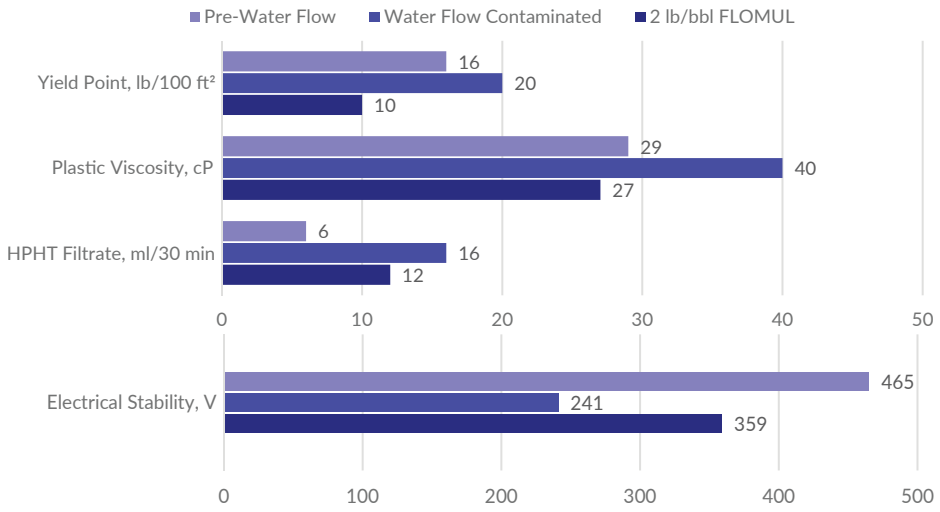
SOLUTION

Treat active system with 2 lb/bbl FLOMUL

Synchronize additions with pump rates for even treatment across the entire circulating system

RESULTS

- Dramatic improvement to primary fluid properties
- Operational delays avoided
- Significant cost savings compared to alternative treatment regimen



OVERVIEW

An operator drilling in the Permian Basin began taking a significant water-flow while drilling the 8-¾" production section with oil-based mud. Immediate changes to drilling fluid properties included a decrease in oil:water ratio, decrease in electrical stability, increase in rheological properties, and increase in HPHT fluid loss. The density was increased to limit the water intrusion, but swift action was required to stabilize fluid properties for continued operations.

AES recommended FLOMUL, an emulsifier specifically formulated to combat the detrimental effects of significant water intrusion into an invert emulsion fluid. A one-time treatment of 2 lb/bbl to the active system resulted in an immediate improvement. Rheological values, HPHT fluid loss, and ES returned to acceptable properties for drilling ahead.

DETAILS

With 9-⅝" intermediate casing set at 5,498 ft. measured depth and drilling of the 8-¾" production zone proceeding, gradual changes to the oil-based mud system indicated a significant water intrusion persisted. As the oil:water ratio began dropping, base oil dilution and product concentrations were increased. However, active system volumes remained constant, suggesting potential simultaneous water invasion and downhole losses. Despite proactive treatment over the course of several days, the oil:water ratio dropped from 64:36 to 59:41, ES dropped from 465 V to 241 V, HPHT fluid loss increased from 6.0 ml/30 min to 16.0 ml/30 min (water in filtrate, indicating emulsion destabilization), and a significant rise in rheological properties - negatively affecting pump pressures. After adding 2 lb/bbl FLOMUL, fluid properties began a dramatic restoration towards pre-contaminated conditions.

The plastic viscosity and yield point dropped from 40/20 to 27/10, respectively. ES rose over 100 V, and HPHT was reduced to 12.0 ml/30 min with no water in the filtrate. No other significant treatments were made to the fluid system during this time. The trend reversal took place in less than 12 hours, saving rig time and resulting in no drilling delays.

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