AES DRILLING FLUIDS

CASE HISTORY

FLOMUL+ WATER FLOW EMULSIFIER PROVIDES RAPID RESTORATION OF FLUID PROPERTIES IN PERMIAN BASIN

CHALLENGE

- Stabilize and restore drilling fluid properties to prevent drilling delays.
- Minimize treatment levels to lower cost impact.

SOLUTION

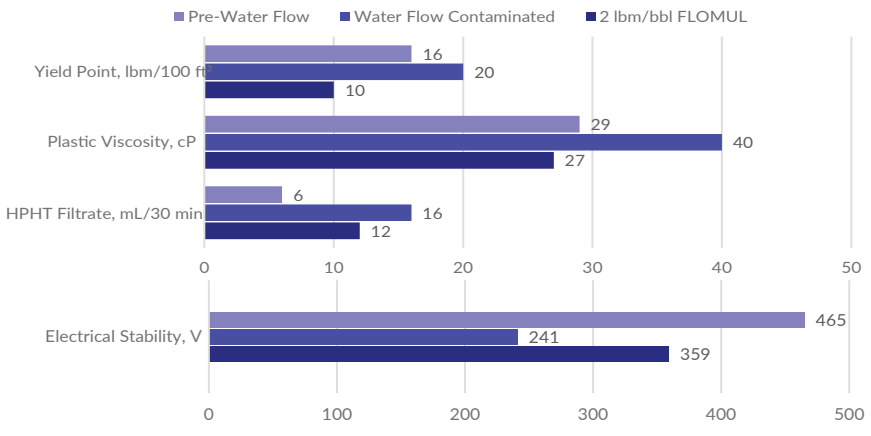
- Treat active system with 2.0 lb/bbl FLOMUL.
- Synchronize additions with pump rates for even treatment across the entire circulating system.

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 in. 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 an increase in HTHP fluid loss. An increase in fluid density was required to help minimize water flow intrusion into the wellbore and fluid system. However, immediate action was required to improve fluid properties and ensure drilling operations continue. 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 2.0 lb/bbl to the active system resulted in an immediate improvement. Rheological values, HTHP fluid loss, and electrical stability substantially improved - allowing drilling operations to proceed without delay.

DETAILS

With 9-⅝ in. intermediate casing set at 5,498 ft measured depth and drilling of the 8-¾ in. 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 a potential simultaneous occurrence of 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, E.S. dropped from 465v to 241v, HTHP fluid loss increased and a significant rise in rheological properties - negatively affecting pump pressures. After adding just 2.0 lb/bbl FLOMUL, fluid properties began a dramatic restoration towards pre-contaminated conditions. Plastic velocity and yield point dropped from 40/20 to 27/10, respectively. ES rose over 100v, and HTHP was reduced to 12.0 mL /30 min. No other significant treatments were made to the fluid system during this time.
FLOMUL provided a rapid improvement in fluid properties, eliminated the potential for operational delays, and prevented costly treatment plans.