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New Fluid Systems Cut Drilling Costs

By Colter Cookson

Water sustains life, so it is only fitting that it also plays a role in producing the energy that sustains Americans' quality of life.

Water's role in drilling fluids is expanding as chemists and engineers at companies both big and small find ways to close the performance gap between muds based on oil and water. The goal is simple, those companies indicate: Give operators a high-performance water-based mud that costs less, performs similar to oil-based mud, and reduces health, safety and environmental risks.

Reducing Fluid Costs

Operators are focused on cost, observes Steve Wilson, vice president of Permian Basin operations for Horizon Mud Company. "In many cases, they are trying different casing designs and experimenting with other changes to save money, which is creating new problems. With a carefully engineered drilling fluid, we often can solve those problems and enable the well to be drilled at a lower cost," he says.

The focus on cost has made it more important to develop fluids that have nothing extra, suggests Ronnie Farish, Horizon's chief operating officer and vice president. He says the company's water-based Clear Fluid System™ has the flexibility to achieve that goal in almost any well.

"We can go from a mildly inhibitive fluid to the most inhibitive water-based mud on the market," he states. "At the bottom of the inhibition scale is the Clear Seal System™, our basic wellbore-strengthening WBM, which is based on

our Clear Seal-5® product. If we need more inhibition, we can add Clear Seal-5 Plus™, or if that is not enough, our Black Sack® or Black Blend® Gilsonite® products. For even more inhibition, we add a potassium source and our Z-Clear Fluid™ in varying concentrations. For maximum inhibition, we can increase the xanthan concentration."

At the bottom of the scale, Farish estimates the fluid will cost only \$20-\$30 a barrel. At the upper end, he puts the cost between \$120 and \$150 a barrel,

with the exact price depending on the amount of Z-Clear Fluid required and whether the well needs low shear rate viscosity.

Farish says Horizon has been working with operators to keep fluid systems as close to the bottom of the cost scale as possible. "When we started in the Delaware Basin, we thought we would need a 20-30 percent concentration of Clear Fluid, but we are running many wells at 10-20 percent, which is taking \$30-\$60 off the cost per barrel," he illus-

Oil-based mud

CLEAR FLUID SYSTEM
Responsible. Sustainable. Viable.

Scale of Inhibition

Extremely Inhibitive

LSRV Properties
(Low Shear Rate Viscosity)
Noninvasive, mechanical inhibition

+ Increase Xanthan Concentration

+ Add Z-Clear Fluid™

+ Add Potassium Source

+ Add Master Black Sack®/Master Black Blend®

+ Add Master Clear Seal-5®/Master Clear Seal-5 Plus™

CLEAR SEAL SYSTEM

By adding products to its water-based fluid system, Horizon Mud Company can vary the system's inhibition to match the needs of the well. The company says it is helping operators reduce costs by finding ways to use fewer additives.



trates.

In the Midland Basin, the company has discovered that it can drill wells using only Clear Seal-5 and Clear Seal-5 Plus systems. “The Clear Seal systems work through stress caging,” Wilson notes. “They contain inerts that fill small fractures in the formation, strengthening the well-bore and helping it maintain its integrity before and after drilling.”

In one Permian Basin well, Horizon ran the Clear Fluid system in an area where the operator had been told he would need drilling beads or a lubricant, Wilson recalls. “We were monitoring torque throughout the well to see if a lubricant would be needed,” he relates. “We did not run a single drum. The operator was used to buying a lubricant to help with torque, so that provided \$20,000-

\$30,000 in savings.”

Because of its high inhibition, the Clear Fluid system allows an operator to switch from an OBM to a WBM, Farish says. “The system can be built on site rather than in a plant, so transportation costs are lower. It also is much easier to dispose of,” he reports. “As a result, the all-in cost often is half that of an OBM.” □