Nine

PROOF OF PERFORMANCE

STINGER DISSOLVABLE PLUG FIELD TRIAL

A simple design with a stark advantage

EFFECTIVE ZONAL ISOLATION AND CLEANOUT IN THE MIDCON

Scenario: In Q3 2019, Nine Energy Service completed a successful trial of the Stinger Dissolvable Plug with a diversified MidCon operator

Results: Successfully deployed the Stinger in two wellbores, one measuring 25,951 feet (MD). All plugs achieved required isolation and degradation, as advertised.

Big success in a smaller package

Wellbore cleanout contributes significantly to the cost of operations. To reduce those costs, many operators have turned to dissolvable plugs. Unfortunately, many of these solutions deliver lackluster results, failing to provide adequate zonal isolation or to accommodate the unique characteristics of a given well.

These were precisely the challenges faced by an operator in Grady County, Oklahoma. Not only was their previously utilized dissolvable plug failing to indicate a noticeable ball-seat pressure signature that would confirm zonal isolation, it also contained substantially more material, which resulted in less-than-optimal cleanout results.

To address these issues, Nine Energy Service recommended the Stinger Dissolvable Plug. The Stinger combines decades of completion tool and material selection experience and expertise. The result is a minimalist dissolvable isolation barrier. The Stinger does not require a mandrel to set the plug. The element uses a wedge component to set and hold pressure. Both features significantly reduce material in comparison to other dissolvable plugs on the market, saving both cost and dissolution time. And the plug will dissolve in both freshwater and high-salinity environments.

The 25,951-Foot Test

To evaluate the Stinger's true performance envelope, the operator ran it in two extremely challenging wells. They trialed five Stingers in the toe of each wellbore. Well A had a measured depth of 25,951 feet and a total vertical depth of 15,421 feet. Well B had a measured depth of 25,425 feet and a total vertical depth of 15,430 feet. Each utilized 5.5", 23#, P-110HP casing and have 98° to 102° deviation in their respective laterals.

To date, these were the longest laterals the Stinger has been exposed to in a pump-down.

During these operations temperatures ranged from 165-230°F with chlorides of approximately 20,000 ppm.

Solution

The Stinger rose to the challenge by successfully conveying to depth; anchoring, sealing and deploying from the setting sequence; properly acting as a barrier during multi-stage stimulation; and predictably degrading according to wellbore characteristics.

All of the tools successfully held pressure without any slippage, enabling successful fracs in all 10 stages. The plugs fully dissolved within the specified timeframe and enabled the operator to begin drill outs shortly after frac completion, during which no parts from the plugs returned to surface.

By using dissolvable plugs instead of traditional composites, the operator was able to avoid high-risk drill outs at the furthest lengths of the wellbore, which helped minimize non-productive time and enabled the operator to bring hydrocarbons to surface faster.