Innovative cementing system reduces cleanout costs prior to well completions

Background

Since its discovery in the 1950s, operators have developed the Bakken formation in southeast Saskatchewan using a progression of completion methods with the goal of increasing recovery rates. Innovative Packers Plus multi-stage completion systems helped establish the Bakken as a major source of light oil in the Williston Basin and continue to provide operators with high-value solutions as drilling and completion methods evolve from short, multi-stage horizontal wells to extended, dual multi-stage horizontal wells.

Challenge

Operators working in the Bakken were having issues with Liner Hanger tools not providing a full seal after cementing operations. This resulted in cement leaking into completion systems and settling inside the 177.8 mm (7-in.) intermediate casing. Before a well could be completed, operators had to mill the cement out of the intermediate casing and then run a polish mill to clean out the Tie-Back Receptacle (TBR). The liner also had to be cleaned out after the Landing Seal Assembly was run in on a Frac String. This three-step remedial process added extra days and cost to cementing operations.

Solution

Packers Plus personnel in the Estevan, Saskatchewan district office have extensive experience with cemented liner tools and identified a low-cost solution to prevent cement from leaking into completion systems. A Liner Top Packer without slips was chosen as an alternative tool for sealing the completion system in the intermediate casing, and a Drill Pipe Dart and Liner Wiper Plug assembly ensured the cement would be fully displaced into the annulus. In addition, the seal inside the Liner Top Packer remains engaged while the packer element is set. These features reduce the amount of debris in the liner during and after cementing the wellbore, and eliminate drill-out costs.

An operator working in the Bakken was confident in deploying this cementing solution because of the high success rate Packers Plus has achieved running the StackFRAC® (SF) Cementor™ stage collar for cemented-back monobore wells.
Results

The operator installed the Packers Plus solution for clean cementing operations in a single lateral horizontal well with a true vertical depth of 1,548 m (5,077 ft) and a measured depth of 3014 m (9,886 ft). The Liner Top Packer with a 10-ft TBR was run in on a 20-stage coil-activated frac sleeve system. Cementing operations were completed according to the cement program without any cement leaking into the intermediate casing. A tractor caliper was run to total depth to confirm there was no cement debris inside the casing or liner, which saved the operator the added time and cost of milling cement out of the system.

Packers Plus has successfully cemented other single lateral horizontal wells in the Bakken for the operator and has also successfully completed cementing operations for dual lateral horizontal wells. Packers Plus implemented its patented process for dual lateral configurations, using a RockSEAL® IIS packer with a Tri-Lug Polished Bore Receptacle at the heel of each lateral to seal and anchor the liners.

Operators working in unconventional oil plays continue to require innovative ways to maximize recovery. Packers Plus works closely with operators and adapts to changing industry demand for specific applications to provide efficient, cost-effective completion solutions.