CASE STUDY

HALLIBURTON

Utica Shale

CHALLENGE

- Pump frac plug down 18,544-ft lateral
- Drill out 124 frac plugs
- Optimize well costs
- Identify reliable solution with history of field-proven success

SOLUTION

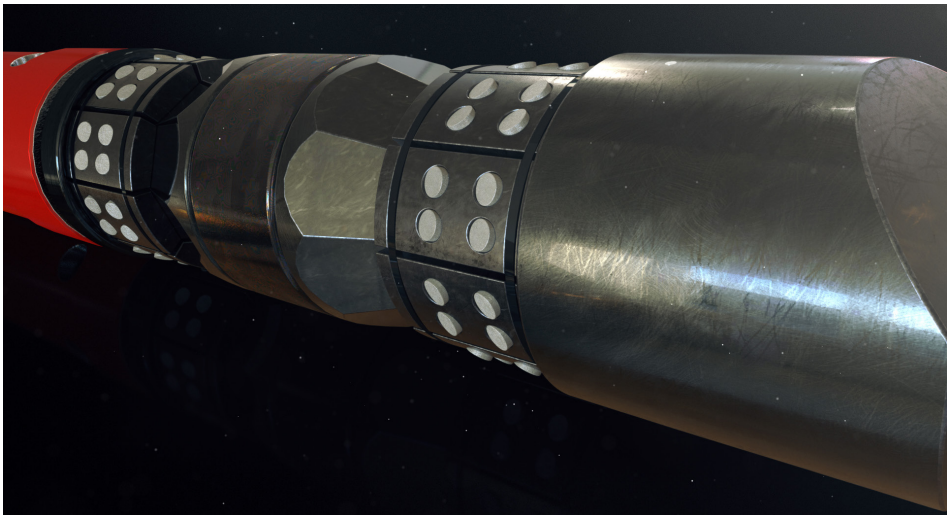
- Obsidian® frac plugs
- Composite plug that has no metal parts
- Reputation for drill-out time
- Designed to provide perfect size cutting when drilled with proper parameters
- Economical solution with proven reliability
- Halliburton wireline adaptor kits engineered with an OD to provide a good chance to avoid preset POOH

RESULT

- Successfully ran 124 Obsidian® frac plugs in 18,544-ft lateral with no presets at an average of 5.3 frac stages per day
- Drillout process averaged seven to 10 minutes per plug with two bits, one short trip
- Achieved a North America land record of 26,641 ft in plug setting depth

Record-setting lateral completion achieved with Obsidian® plugs

Halliburton and operator set 124 frac plugs at an average of 5.3 frac stages per day



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Overview

An operator in the Utica Shale chose to optimize well development cost with longer laterals or "superlaterals." For this project, the lateral was a record 18,544 ft in length and 27,034 ft in total measured depth. A total of 124 Obsidian® plugs were set in a 5 1/2-in., 23-lb/ft P-110 casing at an average of 5.3 frac stages per day. During the first 10 runs, a maximum pump-down rate of 18 bbl/min and a maximum line speed of 417 ft/min were achieved. All plugs were tagged on depth during the drillout process, which averaged seven to 10 minutes per plug.

Challenge

Setting and drilling out 100 + frac plugs in an extended-reach 18,544-ft lateral is no easy feat; so, develop of a reliable, field-proven completion solution was key. The operator considered running a sleeve system for the extended lateral; however, Obsidian plugs proved to be a more economical option, and previous experience gave the operator confidence in the success of this technology.

Solution

Obsidian® frac plugs are made from composite material without using any metal parts. They have a reputation for drilling out in a short time with the proper size cuttings. This provides quicker drillout times by not bridging off the backside of the tubing or clogging the flowback screens.

The Halliburton wireline adaptor kits used in setting plugs are engineered with an outside diameter that provides optimum dimensions to avoid presets.

All the plugs were tagged on depth during the drillout process, which used only two roller-cone bits with a 3 1/8-in. mud motor on a standalone unit. The first roller-cone bit drilled out 70 Obsidian frac plugs without a short trip, and the second roller-cone bit had only one short trip after 30 Obsidian plugs were drilled out. The 3 1/8-in. mud motor operated at 200 revolutions per minute with a pump rate through the tubing of 3 to 4.5 bbl/min, which resulted in 250- to 275 revolutions per minute at the bit.

Result

The well was completed in 23.5 days, and a plug-and-perf hydraulic fracturing stage was placed every 150 ft along the 3.5 mile-long lateral. Halliburton and the operator set 124 frac plugs averaat an average of 5.3 frac stages per day and achieved a North America land record of 26,641 ft in plug setting depth.

This achievement offers more evidence to support the reliable reputation of the Halliburton Obsidian frac plugs, even when tested in lateral lengths not reached before.

Roller cone Bit #1 - Drilled out 70 Obsidian® frac plugs with no short-trip

Roller cone Bit #2 - Drilled out 54 Obsidian® frac plugs in one short-trip after 30 Obsidian® plugs

For more information, contact your local Halliburton representative or visit us on the web at www.halliburton.com

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