

PDC Bit Designed with Stega™ Feature Improves ROP and Drilling Results in Horizontal Well

WOLFCAMP FORMATION, WEST TEXAS

CHALLENGE

Reduce number of BHA runs required to drill 8-1/2-inch curve and lateral section of a horizontal well by extending footage drilled per bit

SOLUTION

Design a Halliburton PDC bit with the Stega™ efficient layout feature to optimize backup cutter engagement, deliver greater footage, and increase ROP

RESULTS

- » Newly designed GTD64DC bit with the Stega feature drilled the curve and lateral section in a single run with a single BHA
- » Achieved 41 percent more footage, with a single run of 8,483 feet (2,586 meters) as compared to best offset
- » Increased average ROP by 19 percent over best offset, reducing total hours to drill the interval

CHALLENGE

In the Wolfcamp formation of West Texas, where horizontal drilling benchmarks are well established, one operator wanted to improve efficiency by drilling the 8-1/2-inch curve and lateral section in a single run, when two bottomhole assembly (BHA) runs typically were required. Offset bit performance had improved to 6,033 feet (1,839 meters), drilled at 80 feet/hour (24 meters/hour), but still required two runs to complete the interval.

SOLUTION

Halliburton recommended applying the new Stega™ efficient layout technique to optimize cutter layout on its existing GTD64C bit design. Delivered through the Design at the Customer Interface (DatCI™) process, the Stega feature determines the specific location of polycrystalline diamond compact (PDC) cutters in an optimum bit design in order to maximize efficiency when backup cutters contact the formation being drilled.

RESULTS

The new 8-1/2-inch GTD64DC bit with the Stega efficient layout feature was run in at 8,761 feet (2,670 meters) measured depth (MD), drilling the entire curve and lateral to 17,244 feet (5,256 meters) MD in a single run and in 89.25 hours. Achieving single-run footage of 8,483 feet (2,586 meters), and an average rate of penetration (ROP) of 95 feet/hour (29 meters/hour), the GTD64DC bit with the Stega design nearly doubled the ROP and run lengths compared to the average of all offset competitor bits, and drilled approximately 2,400 feet (732 meters) farther at an ROP that was 15 feet/hour (5 meters/hour) faster than the next-best offset (a Halliburton design without a Stega feature).

TECHNOLOGY ADVANTAGES

The Stega efficient layout technique improves the bit's drilling efficiency by strategically changing cutter positions and optimally offsetting the backup cutters. This optimized cutter placement is made possible through Halliburton advanced bit/rock interaction modeling. Our latest proprietary and patented model is proven through rigorous lab and field trials. Using the DatCI process, which brings custom solutions to specific applications, the Stega feature can be applied during bit design to optimize cutter engagement and improve drilling performance for the specific application at hand.

ACHIEVED
41 PERCENT
MORE FOOTAGE
WITH A SINGLE RUN

The Stega™ efficient layout feature strategically positions backup cutters along the profile to remove load stress from the primary cutting structure and ensure highly efficient backup cutter engagement for greater footage and faster ROP.

Whether trying to drill faster with no loss of durability, or farther while retaining high ROP, the Stega efficient layout feature is proving to be an effective design solution in a range of applications around the world.

CONCLUSION

Halliburton PDC bits designed with the innovative Stega feature are optimized for maximum cutter efficiency when backup cutters come into contact with the formation. By strategically changing backup cutter location to take advantage of the bottomhole pattern created by the primary cutting structure, the customized layout optimizes backup cutter engagement without compromising cutting structure durability or toughness. As a result, even in applications like the Wolfcamp formation, where performance benchmarks have been established, PDC bits designed with the Stega feature continue to deliver drilling performance improvements with longer runs and faster penetration rates.



HAL123469

The Stega™ efficient layout technique improves bit drilling efficiency.

www.halliburton.com

Sales of Halliburton products and services will be in accord solely with the terms and conditions contained in the contract between Halliburton and the customer that is applicable to the sale.

H012908 04/18 © 2018 Halliburton. All Rights Reserved.

HALLIBURTON