CASE STUDY

PDC Drill Bits with RockStorm Technology
Increase ROP by 29% for Canbriam Energy, Canada

Wear-resistant high-impact cutter technology drilled three vertical hole sections at ROP of 45 m/h, 43 m/h, and 40 m/h in Montney shale play.

CHALLENGE
Improve drilling efficiency in an 8¾-in vertical wellbore when penetrating hard, abrasive, and interbedded formations in the Montney shale play.

SOLUTION
Smith Bits reconfigured the IDEAS* optimized PDC bit with RockStorm* wear-resistant high-impact PDC cutter technology on three identical 8¾-in MASi613 PDC bits.

RESULTS
Increased average ROP by 29% while drilling three vertical hole sections through the hard and abrasive formations.

Increase drilling efficiency in interbedded, hard, and abrasive formations
Canbriam Energy was attempting to develop natural gas reserves in the Montney shale play in British Columbia, Canada, with horizontal drilling techniques. To reach the reservoir, the operator had to drill through the Cadomin formation—composed of tight sand with abundant conglomerate and chert—and the Nikanassin formation, which is made up of extremely abrasive and interbedded sand, silt, coal, and shale. The formations also have a high unconfined compressive strength (UCS) ranging from 14,000 psi to 24,000 psi. The alternating lithologies and large UCS variation resulted in PDC cutter damage and accelerated wear, reducing ROP and driving up field development costs. To improve drilling efficiency and wellbore quality, the operator needed a PDC bit with durable cutters capable of retaining a sharp edge.

Optimize drill bit with wear-resistant high-impact PDC cutter technology
To mitigate impact damage and abrasive wear on the bit’s cutting structure, Smith Bits recommended RockStorm wear-resistant high-impact PDC cutter technology to be fitted on three identical 8¾-in MASi613 bits and run on the same rig as the baseline bits. In demanding drilling environments, abrasive formations require a specific type of cutter capable of retaining diamond material to keep a sharp edge and maintain ROP. Bits used in hard formations are fitted with a different type of cutter that is manufactured to withstand impact damage. The RockStorm technology possesses both properties, allowing for superior resistance to abrasive wear and impact damage.

When compared with conventional cutters (left), the strategically-positioned RockStorm cutters demonstrated increased durability to improve drilling efficiency.

Drill Bits
**CASE STUDY:** PDC drill bits with RockStorm technology increase ROP by 29%

**Improved average ROP by 29%**
The first drill bit equipped with RockStorm technology drilled 969 m at 45 m/h. The second drilled 930 m at 43 m/h. The third drilled 952 m at 40 m/h. When compared with the 33 m/h average ROP of standard cutters, the RockStorm technology delivered a 29% increase in average ROP. The dull condition was also improved with significantly less wear and damage to the critical shoulder area.

The 8¾-in MASi613 with RockStorm technology increased ROP by 29% and significantly improved dull bit condition.