Cimarex Saves 26 Hours in Permian Basin with Slimhole PowerDrive Archer RSS

Slim high-build-rate RSS with SHARC drill bit achieves 10°/100-ft curve, drilling lateral to TD in one run and eliminating additional trips

### Challenge
Drill out the 7-in casing to build a curve at planned 10°/100 ft and continue to drill lateral section.

### Solution
Use the 4¾-in PowerDrive Archer* high build rate rotary steerable system (RSS) paired with a custom-designed SHARC* MDSi711 high-abrasion-resistance PDC drill bit from Smith Bits, a Schlumberger company.

### Results
- Drilled 10°/100-ft build to land the curve on plan and continued on to geosteer 4,300-ft lateral to TD—in one run.
- Eliminated trip at end of curve for lateral assembly, saving Cimarex 26 hours of rig time.
- Drilled a total of 4,787 ft within only 110.3 hours.

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**Increase efficiency drilling horizontal well**

Cimarex Energy was drilling a well named Black Powder in the Third Bone Spring play of the Permian basin. The team set a 7-in casing at 45° and wanted a durable BHA to execute a high dogleg severity (DLS) curve and geosteer the horizontal section within a 7-ft thick TVD zone—in one run. Using conventional methods in this formation, operators must trip the BHA after landing the curve to switch to a BHA for geosteering. This tripping for projects with two assemblies adds approximately 48 hours to the drilling process.

**Select slimhole BHA for high dogleg severity and geosteering**

Schlumberger built a slimhole BHA using the PowerDrive Archer 475 RSS coupled with a SHARC MDSi711 PDC drill bit designed specifically for this application. The combination was assembled for its ability to drill the planned 10°/100-ft curve with ease. The PowerDrive Archer 475 RSS is rated to execute up to 18°/100 ft DLS, in addition to its fully rotating design that enables the system to drill high-quality horizontal sections.

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The PowerDrive Archer BHA drilled through the 7-in casing point to achieve a 10°/100-ft DLS, landing the curve on plan at 11,200-ft MD and continuing on to drill that lateral to TD at 15,518-ft MD.
CASE STUDY: Cimarex saves 26 hours in Permian basin with PowerDrive Archer slimhole RSS

While drilling the 6¼-in section, an abrupt formation change caused the BHA to exit the target zone. The SlimPulse® retrievable measurements-while-drilling (MWD) service delivered real-time gamma ray data that enabled the well placement team to quickly reenter the zone. A conventional drive system might have deflected on reentry, but the PowerDrive Archer system with full directional control corrected to the well plan without issue.

Landed curve, drilled lateral to TD in one run
Using the PowerDrive Archer RSS, the Schlumberger team drilled the build section at 10°/100 ft to land in the Third Bone Spring formation according to plan. After landing the curve, the BHA continued on to drill the 4,300-ft lateral to TD. The two sections were successfully drilled in one run despite the abrupt formation change that caused a zone exit. The PowerDrive Archer BHA drilled 4,787 ft total in only 110.3 hours, saving Cimarex an estimated 26 hours by eliminating the need for multiple trips.

The 4¾-in PowerDrive Archer RSS is rated to drill curves up to 18°/100 ft.