Horizontal Well Placement Maximizes Oil Production

Case study: PeriScope mapping enables Andes to reduce drilling costs and risks by eliminating need for pilot holes in geologically uncertain area

Challenge
Place horizontal wells in sandstone reservoir with uncertain geology without drilling pilot holes.

Solution
Use PeriScope* bed boundary mapper to geosteer PowerDrive* rotary steerable system.

Results
Reduced drilling costs and risks by eliminating need for pilot holes. Achieved production rates significantly higher than in conventional offset wells. Ran production screens to TD without problems encountered in other wells in area.

Maximize drainage and ROI
Andes Petroleum Limited planned to drill two horizontal wells in Alice field, located in the Sub-Andean sedimentary basin area of Ecuador. The target—the M1 sandstone reservoir—was commonly considered risky for horizontal drilling without a pilot hole, due to uncertainty about the depth, thickness, and log response of the zone of interest. Andes wanted to place the wells where they would maximize drainage and ROI—without drilling pilot holes.

Optimize well placement
PeriScope bed boundary mapping while drilling enabled Andes to achieve that goal. Because this mapping showed the direction and distance to reservoir boundaries or fluid contacts in real time, it allowed the wellbore trajectory to be adjusted as necessary.

The mapping predicted the approach of the top of the high-resistivity sandstone interval, permitting the driller to optimize the landing of the 8½-in lateral sections. After landing, PeriScope real-time mapping was used to geosteer the PowerDrive rotary steerable system (RSS) within the high-resistivity zone. This allowed placement of the lateral sections as close as possible to the top of the zone to optimize production, and as far as possible from the oil/water contact to delay water influx.

PeriScope mapping was used to geosteer the PowerDrive RSS to place the wellbore as close as possible to the top of the high-resistivity zone.
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Using PeriScope real-time mapping to geosteer the PowerDrive RSS enabled Andes Petroleum to place the horizontal wells where they would maximize production and ROI—without drilling pilot holes.

Reduce drilling costs and risks

The PowerDrive RSS, geosteered using PeriScope mapping, drilled both horizontal wells successfully—without pilot holes—in less time than expected. Eliminating the need for pilot holes reduced drilling costs and risks, and the smooth wellbores left by the PowerDrive system allowed the production screens to be run to TD without problems—a first for the area.

The production rates of both horizontal wells surpassed the production rates of conventional deviated or vertical wells in the area. Both horizontal wells were successfully steered inside the zone of interest and provided stable production three to four times greater than the average production of conventional deviated wells—with lower water cut. Because of the success achieved with PeriScope mapping and the PowerDrive RSS, Andes Petroleum decided to change its drilling campaign, which was originally based on deviated wells, to drill more horizontal wells using Scope* services for greater efficiency, improved reliability, and better answers that enhance operational safety while drilling.

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