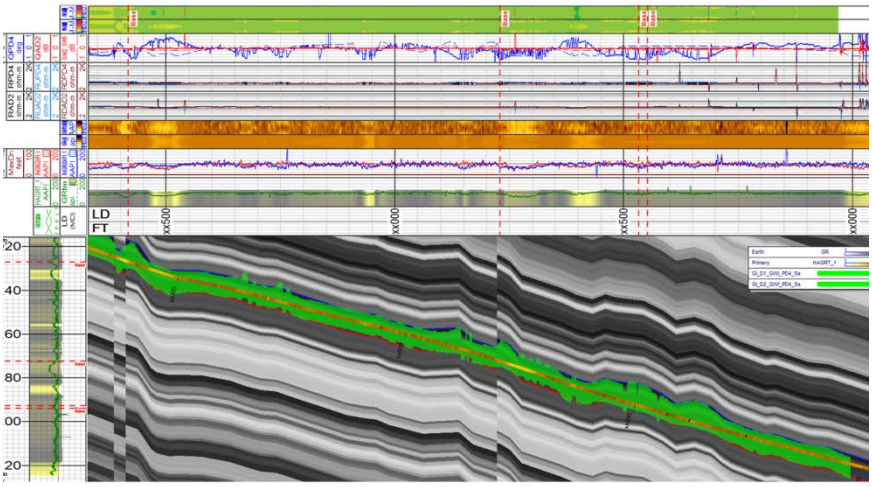
GuideWave® Tool Helps to Land Multiple Wells, Successfully Drilling Laterals in Narrow Pay Zones



Real-time measurements from the GuideWave tool enabled the geosteering services team to land a horizontal well within a narrow reservoir and maximize exposure to the pay zone.

Objectives

- Geosteer four horizontal wells through a complex, narrow sandstone reservoir of a lacustrine depositional environment.
- Land in a 13-ft-thick oil-bearing sandstone near the center of the reservoir, maintaining optimum position to TD.

Our Approach

- The Weatherford GuideWave azimuthal resistivity tool is designed to accurately land and then navigate a horizontal well within a narrow geologic target.
- Using measurements from the GuideWave tool and the telemetry capability of the HEL MWD system, the geosteering team made real-time adjustments (with the help of up/down resistivities and conductive bed responses) to maintain wellbore trajectory in the low-resistivity target zone.
- Once the landing was achieved, the focus for each well was to bring the trajectory into the center of the “sweet spot” and drill ahead with the aid of the structural dip derived from the bed boundary mapping.
- Data from the GuideWave tool, the high-temperature azimuthal gamma ray (HAGR™) sensor, and mud-logging cuttings analysis contributed to the success of this well.

LOCATION
US, land

WELL TYPE
Horizontal development

FORMATION
Oil sand

TOOL SIZE
6 1/8 in.

LATERAL LENGTH
7,168 ft (2,184.8 m)

IN-ZONE AVERAGE
91% in zone: 6,512 ft (1985.4 m)

INCLINATION
Averaging 3° down dip

PRODUCTS/SERVICES
GuideWave azimuthal resistivity tool
HEL MWD system
HAGR high-temperature azimuthal gamma ray sensor
BAP bore and annular pressure sensor
Revolution® rotary-steerable system

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Value to Client

- The GuideWave tool provided input parameters for real-time distance-to-bed inversion used in distance-to-bed-boundary calculations and dip interpretation. This enabled the geosteering team to quickly adjust the drilling trajectory to remain within the target zone.
- The geosteering team identified a high-resistivity carbonate streak, which proved helpful in leveling the trajectory and maintaining the wellbore at the center of the reservoir.
- Input from the LWD measurements and mud logging analysis provided guidance for the geosteering team, resulting in an in-zone average of 91% for the four wells drilled at that field.

* GuideWave is a registered trademark of Weatherford in the US. Revolution is a registered trademark of Weatherford in the US and Canada.

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