CrossWave® and GuideWave® LWD Tools

Provide Sourceless Geosteering For Two Offshore 6-in. Lateral Wells, Maintain 100% Payzone Contact

Objectives

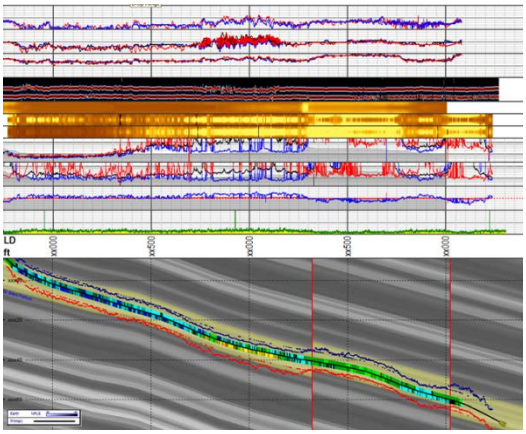
- Geosteer two 2,500-ft (762-m) lateral wells using real-time sonic and resistivity logging-while-drilling (LWD) data. The targeted payzone is a12-ft (3.4-m) thick, carbonate reservoir.
- Mitigate geologic uncertainty. Because neither offset well data nor formation dipping data is available, nuclear-sourced LWD tools are not permitted.

Our Approach

- Working closely with the client, Weatherford deployed a well-placement team for a thorough pre-job analysis. The team suggested use of a sourceless azimuthal sonic and resistivity bottomhole assembly (BHA) with the following configuration: 6-in. CrossWave sonic tool, GuideWave azimuthal resistivity tool, a high-temperature azimuthal gamma ray (HAGR™) sensor, an integrated directional sonde (IDS™) sensor, and a hostile-environment-logging (HEL) measurement-while-drilling system.
- The Weatherford team ran the toolstring downhole to a depth of 12,250 ft (13,733 m) and began drilling the 6-in. lateral sections. While drilling, azimuthal multi-frequency electromagnetic propagation and sonic measurements detected the target zone boundaries. This enabled accurate structural and stratigraphic interpretation and proactive geosteering within the thin zones of interest.
- The operation also provided real-time distance-to-boundary measurements, up/down-resistivity values, azimuthal resistivity imaging, raw-frequency phase shifts between 2 MHz and 400 KHz, acoustic waveforms, and computed compressional and shear velocities in 16 azimuthal bins. The team computed real-time quadrant compressional and shear slowness values by stacking all 16 bins of data, which provided a high signal-to-noise ratio and excellent data quality.
- The team geosteered both lateral sections a total of 2,500 ft (762 m) into the target zone with 100% payzone contact. The operation incurred no HSE events or nonproductive time.

Value to Client

- Through use of LWD services—including the ShockWave and GuideWave tools—the Weatherford team geosteered both 6-in. laterals to total depth despite geologic uncertainty.
- The operation provided a sourceless azimuthal sonic and resistivity BHA that delivered 100% target zone contact.



Using a sourceless azimuthal sonic and resistivity BHA, Weatherford successfully delivered two 6-in. lateral wells despite a high degree of geologic uncertainty.

LOCATION
Abu Dhabi, UAE

WELL TYPE
Offshore oil

FORMATION TYPE
Carbonate

HOLE SIZE AND ANGLE
6 in. at 90°

TEMPERATURE
195°F (90.5°C)

LATERAL DEPTH
14,800 ft (4,511 m)

LATERAL LENGTH
2,500 ft (762 m)

PRODUCTS/SERVICES

- LWD Services
- CrossWave sonic tool
- GuideWave azimuthal resistivity tool
- IDS sensor
- HEL sensor
- HAGR sensor
- Revoultion® RSS with near-bit gamma ray (NBGR)

Weatherford®