**Operator Maps Complex Gas Sands, Avoids Risky Sidetrack Offshore Australia**

Reservoir mapping-while-drilling service improves seismic interpretation, removes uncertainty of reservoir depth

**CHALLENGE**
Map complex reservoir with discontinuous sands and anticline to position drain trajectory, steer aggressively to connect discontinuous sand bodies, and minimize the risk of drilling a sidetrack.

**SOLUTION**
Combine deep, directional electromagnetic measurements from GeoSphere* reservoir mapping-while-drilling service with seismic data to improve reservoir interpretations, land wells, and make real-time steering decisions.

**RESULTS**
- Mapped reservoir layers accurately to resolve seismic uncertainty.
- Landed wells in gas sands without drilling sidetrack.
- Steered aggressively in discontinuous sands environment, keeping wellbore within reservoir.

**Land in gas sands, avoid sidetrack despite seismic uncertainty**

An operator drilling tight-gas production wells in the Otway basin offshore western Victoria in southeast Australia faced several challenges. This field has a complex stratigraphy, is situated on an anticline and comprises discontinuous sand bodies with siltstones between the sand bodies. To develop this asset, the operator had to drill long horizontal wells to expose the wellbore to as many of the sand bodies as possible, which creates a tortuous, complex wellbore. The operator also faced seismic uncertainty of ±33 ft [±10 m].

Together, these challenges preclude the use of conventional methods to achieve the operator’s goals of mapping the reservoir, positioning the drain trajectory optimally, and making real-time steering decisions to connect the sand bodies. Additionally, the operator wanted to avoid, if possible, drilling a sidetrack, which is costly and mechanically risky.

The GeoSphere service enabled real-time updates of the seismic interpretation model to increase understanding of the geological structure.
CASE STUDY: Reservoir mapping-while-drilling service maximizes reservoir exposure in complex gas sands

Map multiple layers in discontinuous sand bodies
The operator chose the GeoSphere reservoir mapping-while-drilling service for its real-time capabilities and 100-ft depth of investigation to map, land, and steer. Using deep, directional electromagnetic measurements, the service maps reservoir layers in excess of 100 ft [30 m] from the wellbore to resolve seismic uncertainty.

The service would be crucial to achieving the operator’s plans of connecting discontinuous sand bodies while drilling based on real-time resistivity measurements from this service.

Maximized reservoir exposure to increase production
The GeoSphere service mapped remote sand bodies at distances exceeding 115-ft [35-m] TVD, bridging the gap between wellbore measurements and surface seismic data. The distance-to-boundary information enabled real-time updates of the seismic interpretation model, increasing the understanding of the geological picture. As a result, the wellbore was able to be aggressively steered to connect the discontinuous sand bodies, maximizing reservoir exposure. The well trajectory built from 84° to 107° before turning and dropping at the crest of the structure to maintain maximum reservoir exposure. The wellbore was kept completely within the reservoir with no sidetrack drilled. According to the operator, without the use of this service, a costly and mechanically risky sidetrack likely would have been necessary.