

# Operator Uses Multipole Sonic-While-Drilling Service to Drill Complex, Over-Pressured Shale Diapir

First use of SonicScope 675 service in China optimizes drilling, well placement with real-time pore pressure monitoring

## CHALLENGE

Drill a shallow-water well through an abnormally over-pressured shale diapir, placing the well in the reservoir while avoiding drilling hazards.

## SOLUTION

- Use SonicScope\* 675 multipole sonic-while-drilling service to obtain accurate, real-time data for seismic tie-in, pore pressure monitoring, and seismic inversion.
- Run service in combination with EcoScope\* multifunction logging-while-drilling service and TeleScope\* high-speed telemetry-while-drilling service to obtain a full petrophysical evaluation.

## RESULTS

- Acquired high-quality monopole and quadrupole data in real-time and recorded mode in the 8.5-in hole with maximum 31.8° deviation.
- Used sonic-to-seismic correlation to generate high-quality synthetics based on real-time sonic and density logs.
- Effectively drilled the well using real-time pore pressure monitoring.



## Drill shale formation with limited offset well knowledge

While drilling a shallow-water well offshore China, an operator needed to better understand the complex, high-pressure formation to successfully drill the 8.5-in section with 31.8° deviation in a high stick/slip environment. Without extensive data from a predefined model or offset wells, real-time pore pressure monitoring and seismic tie-in would provide the necessary information to help the operator drill the well and mitigate risk. By using advanced multipole sonic-while-drilling technologies that obtain robust real-time and recorded measurements, the operator could more successfully drill while obtaining insight and information for future wells.

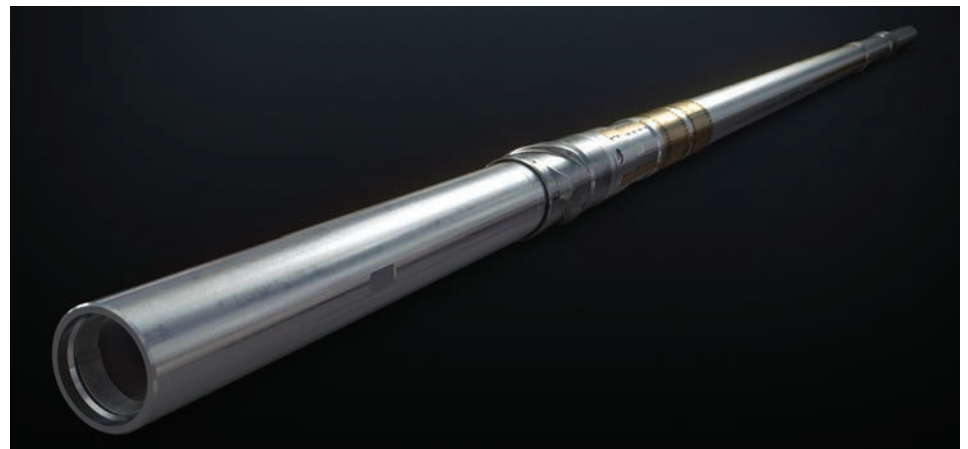
## Obtain multipole sonic data while drilling

Schlumberger recommended using the SonicScope multipole sonic-while-drilling service, which combines high-quality monopole and quadrupole measurements to deliver real-time compressional and shear information—along with Stoneley data—in any formation, regardless of mud slowness. These measurements enable more confident decisions while drilling, helping eliminate unnecessary casing strings, mitigate risk and improve safety, reduce nonproductive time, and save drilling days and costs.

## Achieved drilling objectives with high-quality measurements

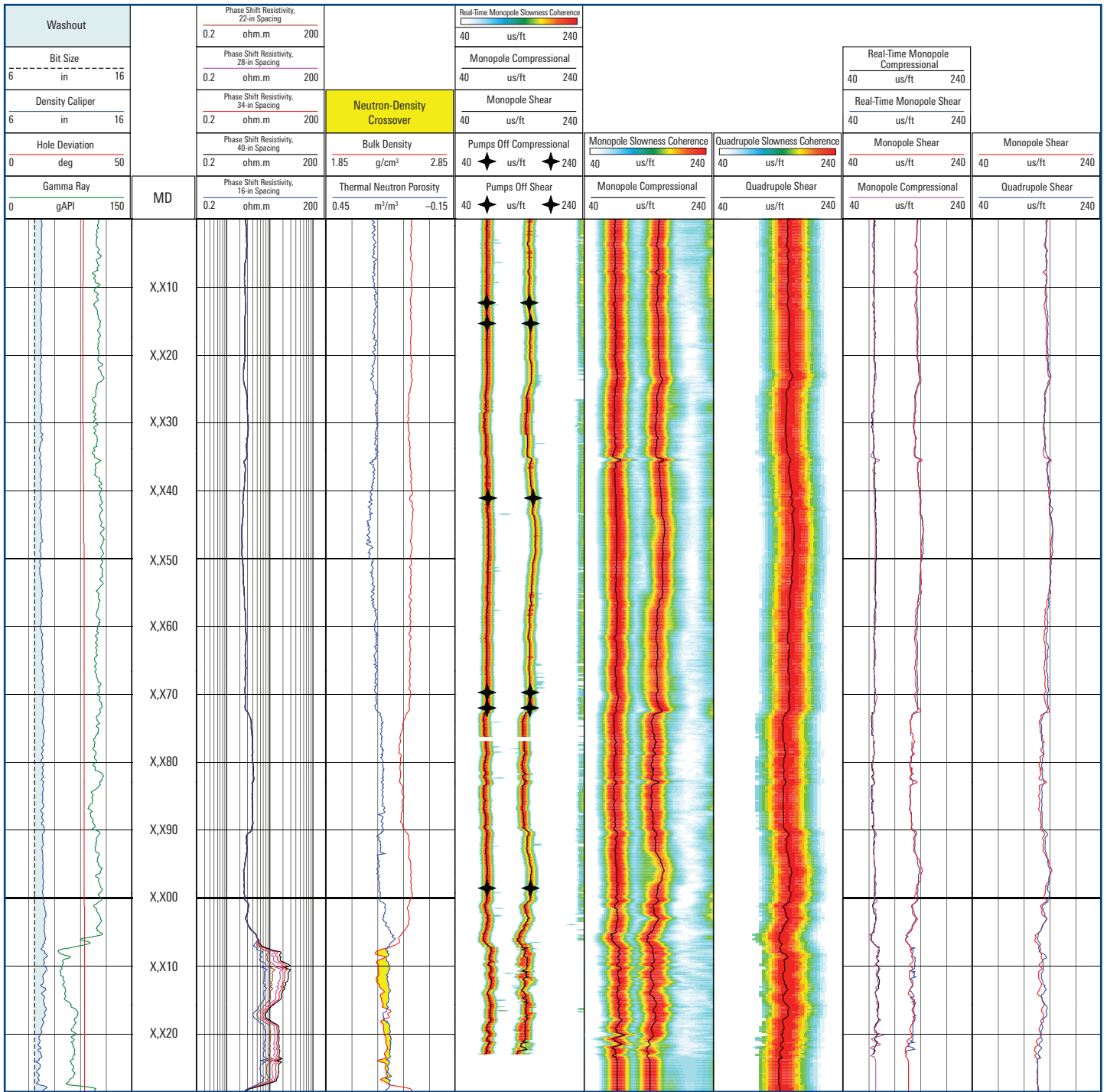
This operation marked the first time that the SonicScope service was run in China. Using the service, the operator achieved drilling objectives, monitoring pore pressure in real time despite the high stick/slip risk in the shale formation. Using real-time sonic and density logs, high-quality synthetics were generated for accurate surface-to-seismic correlation in the time-depth domain. For a full petrophysical evaluation, the service was run in combination with EcoScope\* multifunction logging-while-drilling service and TeleScope\* high-speed telemetry-while-drilling service.

The data obtained by the SonicScope service enabled the operator to optimize well placement and mitigate risk when drilling the complex, high-pressure reservoir. After POOH, data recorded by the SonicScope service was delivered to the operator's technical experts for future prestack AVO surface seismic inversions.



*SonicScope 675 multipole sonic-while-drilling service.*

# CASE STUDY: Operator uses multipole sonic-while-drilling service to drill complex, over-pressured shale diapir, China



The operator concluded during the QC process that there was excellent data consistency between the real-time and recorded memory as well as the monopole and quadrupole measurements.

slb.com/SonicScope

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