DEEP WATER

CASE STUDY

# New LWD Density Service Saves Operator USD 1 Million

## UNIQUE 9.5-INCH LWD ALD™ SENSOR PROVIDES ACCURATE DATA IN LARGER BOREHOLE SIZES

GULF OF MEXICO

### CHALLENGES

- Difficulties in obtaining bulk density and image measurements in a large-diameter borehole
- Structural dip information was needed below the salt to reduce geological uncertainty

### SOLUTION

- 9½-inch LWD azimuthal lithodensity (ALD™) sensor with 14¼-inch blade

### RESULTS

- Saved USD $1 million from wireline deployment
- Good-quality, real-time borehole images made it possible to obtain accurate dip information and formation density

### OVERVIEW

During a subsalt deepwater project (water depth of over 5,200 ft (1,585 m)) in the Gulf of Mexico, an operator faced significant uncertainties in the geological model below a salt section. In this area, it is often difficult to acquire good-quality seismic images due to attenuation of seismic signals by the overlying salt formations. When a new well is drilled in a large-hole section, which is normally drilled by a 9½-inch bottomhole assembly (BHA), accurate structural dip information is critical in order to validate the geological model. Typically, the only way to obtain density measurements in large borehole diameters has been to run an expensive and time-consuming wireline operation. To increase efficiency and reduce geological uncertainty, the operator needed a new logging-while-drilling (LWD) solution that could provide real-time dip information – an LWD solution that was previously not available for large hole sizes. Sperry Drilling recommended its new 9½-inch LWD azimuthal lithodensity (ALD™) sensor in order to provide the operator with accurate formation density and dip information in the 16½-inch borehole.

### OBTAINING REAL-TIME DIP INFORMATION AND MEASURING BULK DENSITY IN LARGE BOREHOLE SIZES WERE NOT AVAILABLE

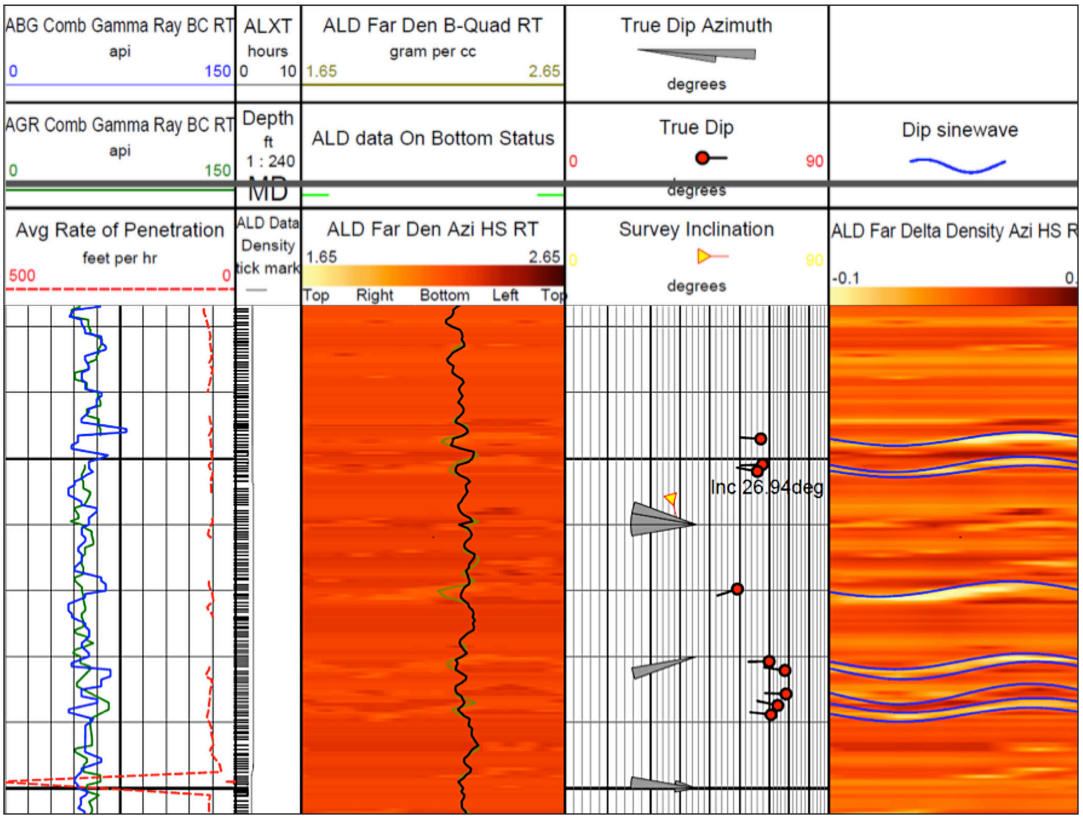
With poor seismic imaging below the salt, the operator found it challenging to validate the geological model. Based on the well design, the salt exit was in the large 16½-inch borehole, and the operator required real-time images to determine the structural dip so that quick well placement decisions could be made. Previously, the operator had to run wireline services to obtain equivalent structural information, adding significant time and cost. The operator turned to Sperry Drilling for a better real-time formation evaluation solution.

### NEW LWD DENSITY SERVICE PROVIDES ACCURATE DATA FOR LARGE-DIAMETER BOREHOLES

Sperry Drilling deployed its new ALD sensor, which features a unique 14¼-inch blade and is currently the only 9½-inch LWD density tool in the industry. This sensor is capable of acquiring formation density measurements and azimuthal borehole images for structural dip interpretations in borehole diameters of 14½ inches to 17½ inches – a capability that is the only one of its kind in the industry. The ALD sensor's real-time images acquired in the 16½-inch borehole enabled the operator to obtain accurate dip information and avoid running costly wireline.

## HIGH-QUALITY REAL-TIME IMAGES FROM ALD™ SENSOR SAVES OPERATOR USD 1 MILLION

Using the new 9½-inch ALD sensor, the operator obtained real-time data from this unique large-size LWD density service to determine accurate dip information, which correlated with the geological model at the salt exit point. Dip interpretation was performed four times a day while drilling the 16½-inch section below the salt formation, using newly developed innovative processing techniques to improve the quality of the images and the dip data. The high quality of the images allowed the operator to cancel a run with a triaxial wireline resistivity tool, thus saving the operator approximately USD 1 million in avoided wireline service costs and rig time.




*The industry's only large-size LWD density service provided excellent structural dip interpretation, thus replacing an equivalent wireline service and saving the operator an estimated USD 1 million.*

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