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Lundin Confirms Formation Tops While Drilling with At-Surface Formation Evaluation Offshore Norway

EcoFlex service improves detection of hydrocarbon-bearing sands, North Sea

CHALLENGE

Identify formation tops and confirm depths while drilling in formation with uncertain rock types.

SOLUTION

Accurately evaluate cuttings at surface with the EcoFlex* multifactor cuttings evaluation-while-drilling service from Geoservices, a Schlumberger company.

RESULTS

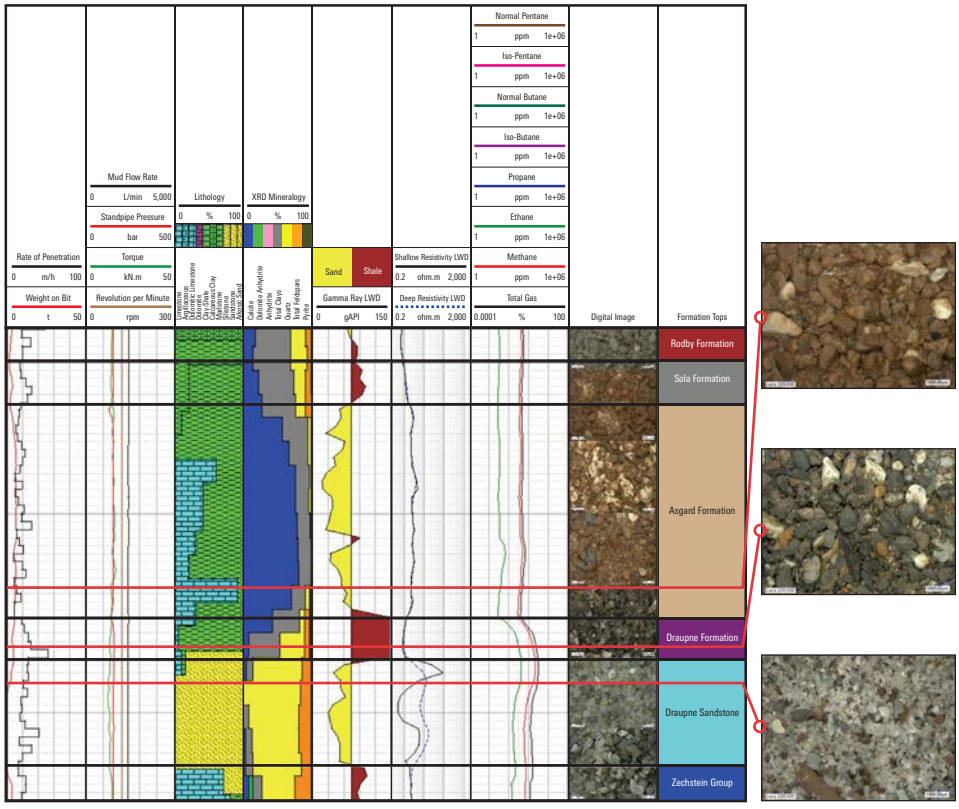
- Eliminated rock typing uncertainties by analysis of 200 samples.
- Identified formation tops and differentiated between alluvial and marine sands based on critical evaluation data.
- Improved knowledge of the field, enabling design and optimization future wells.

Improve geological description of variable formations

As part of a drilling campaign offshore Norway, Lundin Petroleum is drilling several wells on the Norwegian Shelf in the North Sea. A few wells are located in the Johan Sverdrup Field, one of the largest oil discoveries ever made on the Norwegian Shelf. While drilling in the field, Lundin had difficulty identifying rock types and the variable depositional environments for the sands of the Draupne Formation and the Rotliegendes Group, the primary and secondary targets of the well, respectively. Lundin needed an immediate solution for more accurately evaluating mineralogy to improve downhole petrophysical evaluation.

Analyze cuttings at surface with lab-quality precision

Lundin had used the EcoFlex service in six wells over the last two years and aims to achieve similar results in its current drilling campaign. As in previous wells, Schlumberger recommended using high-resolution digital microscopy (HRDM) and X-ray diffraction (XRD), which are offered through this modular, at-surface cuttings evaluation service.



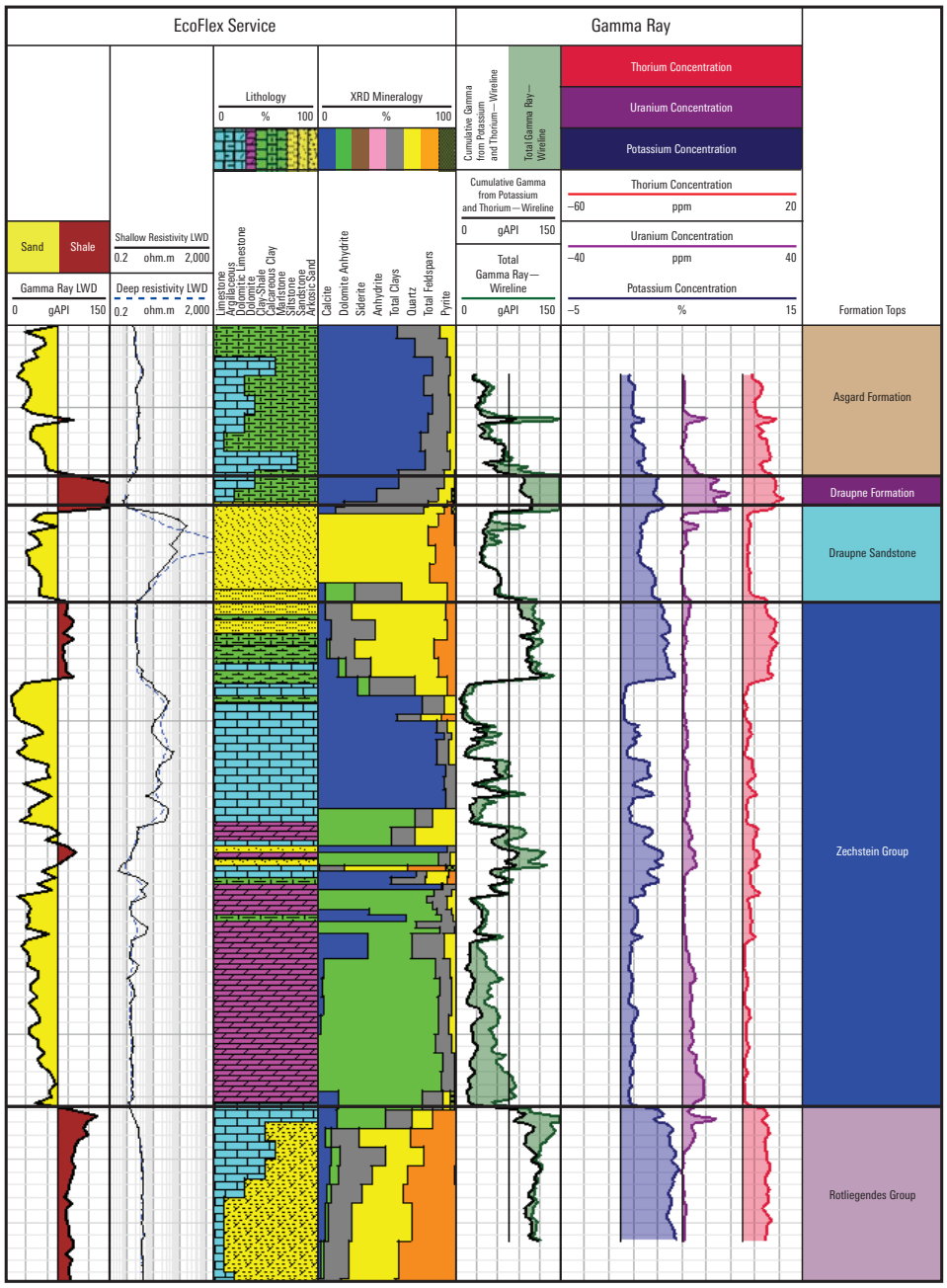
The EcoFlex service clearly imaged and defined rock color, texture, and grain shape and made this information available in near-real time for onsite and offsite interpretation.

Eliminated rock type uncertainty

The EcoFlex service was used to test cuttings samples every 10 m in nonreservoir intervals and every 3 m in reservoir intervals. HRDM magnified cuttings up to 200 times, and XRD quantified the mineralogical content of the formation.

Lundin considered this data crucial for accurately identifying formation and mineralogical changes and reviewed it in near-real time for confirmation and guidance. Samples at particular depths were also prioritized to help Lundin identify changes in lithology and to conduct quick analysis of core chips that surfaced immediately following a core run. This information complemented downhole petrophysical measurements and improved Lundin's ability to identify hydrocarbon-bearing sands.

Using the data acquired by the EcoFlex service in this and the previous six wells, Lundin is building a database of mineralogy and rock type to improve well correlation, understanding of the depositional environment, and completion design for the entire field.



This composite log from EcoFlex service improved identification of formation tops.

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