

## **Reservoir and Fluid Contact Delineation from Seismic Data in the Niger Delta**

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Reservoir quality and hydrocarbon lateral extent are of key importance in the determination of economic viability of fields and exploration opportunities. With limited well data control, the lateral uncertainty in reservoir properties such as N/G, porosity and reservoir continuity, can be further reduced with the use of 3D seismic data. This requires the integration of geophysical, geological, production and petrophysical data.

This paper discusses the reliability of seismic attributes for hydrocarbon contact prediction. In addition, it discusses the use of seismic inversion results to distinguish different lithologies (hydrocarbon sands vs. brine sands/shales), and assists in the stratigraphic interpretation of a reservoir field in the Niger Delta.

BN1 is a gas field located in the South West Niger Delta and penetrated only by two wells. Seismic amplitude and other volume derivatives (acoustic impedance, spectral decomposition, etc) have been used for hydrocarbon contact prediction and reservoir delineation. The integration of the 3D seismic is not without its own limitations. The key factors to be considered are data quality and other influences of the seismic amplitude response with respect to hydrocarbon content, such as tuning effect, porosity variation, and saturation changes.

The result of this study has led to a more cost effective method of defining the Field Development Plan (FDP), through the use of a seismically constrained reservoir model that provides better well placement to achieve improved production.