

# SEALING CAPACITY OF MASS TRANSPORT DEPOSITS: DEPOSITIONAL MODEL FOR A DEEPWATER RESERVOIR IN THE JUBILEE GAS FIELD, EASTERN GULF OF MEXICO

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## Abstract

Mass transport deposits (MTDs) are important stratigraphic elements in deepwater basins because of their complex petrophysical properties. MTDs have traditionally been identified as seals but can also act as migration pathways. Studying the character of deposits within a MTD from proximal to distal, in a framework of seismically identifiable morpho-domains might provide a template for using seismic nature to predict MTD petrophysical properties. During mass gravity flows, a MTD is exposed to high shear deformation that can enhance the clay alignment of the MTD material thus creating potential seal quality facies. Deformation in the various MTD morpho-domains can be quantified by measuring the degree of clay-fabric alignment—a methodology never previously attempted to evaluate seal potential. In this study we investigate a MTD acting as seal in the Jubilee gas field, Gulf of Mexico, by integrating three-dimensional—seismic, core, and well-log data to characterize the degree of clay fabrics within the sealing MTD. The x-ray—texture goniometry analysis was performed using core material from the MTD to determine the degree of clay alignment. Preliminary results indicate that samples have an anomalously high clay-fabric orientation not correlated with burial depth or diagenesis. We conclude that these zones with high clay-fabric alignment in the MTD are the result of shear deformation as the gravity flow moves downslope. We are applying similar techniques to determine fabric alignment in MTDs outcropping in New Zealand. This technique could lead to the ability to identify sealing MTD facies in core samples.