P4B-2

USE OF SEISMIC FACIES CHARACTERIZATION FOR IDENTIFYING PLIOCENE-HOLOCENE CONTINENTAL SHELF/SLOPE FACIES, CENTRAL LUCONIA PROVINCE, OFFSHORE SARAWAK

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ABSTRACT

The Central Luconia Province, offshore Sarawak, is one of the geological provinces in Malaysia which is being explored extensively. The main target of hydrocarbon exploration in this area, so far, is Miocene carbonate sequences. The Central Luconia Province comprises also Pliocene-Holocene clastic sequences, which is not well-studied yet. Hence, this study is focused on the characterization of these clastic sequences based on seismic and supported by well data. In this research, seismic facies characterization is carried out on regional two-dimensional (2-D) seismic sections to understand the seismic facies characteristics, depositional environments, and the facies interpretation. This study is carried out by, first, establishing seismic stratigraphic framework to identify seismic sequences, and second, characterizing individual and group of reflections within each sequence. Several seismic facies units were defined based on parameters as follows: reflection amplitudes, frequencies, continuities, geometries, and configurations. The Pliocene-Holocene clastic supersequence is divisible into six, three-order sequences that separated by six sequence boundaries, which reflect fluctuations of sea level during Pliocene to Holocene. Six seismic facies units were also identified within these clastic sequences. There are middle-lower bathyal deposits, shelf/neritic shale deposits, prograding shelf deposits, onlap-fill deposits, slump/debris flow deposits, and basinal hemipelagic shale deposits. Some facies units are estimated potential for hydrocarbon accumulation. In general, seismic facies characterization can be used as a tool in determining the facies in the study area. More data and further detailed analyses, like core description, log correlations, are required to determine the presence of source, reservoir and seal rocks in order to find hydrocarbon accumulation.