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THE APPLICATION OF SEQUENCE STRATIGRAPHY TO THE SAJAU (PLIOCENE) COAL DISTRIBUTION IN BERAU BASIN, NORTHEAST KALIMANTAN, INDONESIA

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ABSTRACT

The deposits in the Sajau coal measures of Berau Basin, northeastern Kalimantan were within a range of facies associations, which ranged a wide spectrum of settings from fluvial to marine. Siliciclastics were found to be more prominent in the transitional to terrestrial coal measures. However, these coal measures contained in addition three laterally extensive marine bands (mudstone). The function of these bands was to play the role of marker horizons, assisting in the correlation between fully marine and terrestrial facies. On investigating this range of facies and their sedimentology, a high-resolution sequence stratigraphic framework could be developed. The third-order Sajau transgression has been already established, and in its light, nine fourth-order sequences are recognized. The study reported peat accumulation principally correlating in transitional areas with early transgressive sequence sets (TSS) and high stand sequence set (HSS) in the composite sequences. In addition, in more landward areas, it correlated with the middle TSS to late high stand sequence sets (HSS). Peat accumulation regimes showed wide differences inside the sequence stratigraphic framework. These differences were considered to be because of deviations in subsidence and background siliciclastic input rates in depositional setting variants. A combination of differences and variations resulted in discrepancies in the rate of accommodation change. Nevertheless, the preservation of coal resources in the middle-to-late HSS in this area was probably due to the rise of the regional base level throughout Sajau.

KEYWORDS: High Resolution, Sequence Stratigraphy, Coal, Pliocene, Berau Basin

INTRODUCTION

The sedimentological characteristics of the flu-vio-deltaic coal measures from the Sajau (Pliocene) sedimentary succession in Berau Basin, northeastern Kalimantan are presented in this study. Furthermore, it recognizes a high-resolution sequence stratigraphic framework of the Sajau. The data obtained in the study helped to establish a proposal for a coal accumulation model. The results would most probably enable coal prediction. In addition, this economically important coal province of Kalimantan Island could be reviewed. Furthermore, a sedimentological and palaeoenvironmental framework was established for future investigations into the evolution of terrestrial to marine communities from this interval.

Sequence stratigraphy is the study of genetically related facies within a framework of chronostratigraphic significant surfaces [1]. The structure of these facies is a relatively conformable strata, which is layered at its top and base by sequence boundaries, unconformities or their correlative conformities [2, 3]. In accordance to this concept, the stratigraphic succession may be divided into genetically related facies of (depositional) sequences layered by sequence boundaries (SB) at their top and base contacts. The sequence may be further partitioned into systems tracts [4] in a complete unit. This study mainly considers the sequence stratigraphic interpretation on the basis of facies associations and