The Geological Model of Kening Trough, East Java, Indonesia: A Reconstruction of Miocene Ngrayong Sand

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Kening Trough is an opening occurred during Miocene time, extended northeast-southwest in East Java. Exploration that held in this area in early 1800 by the Dutch's company, had found that the Miocene Ngrayong sand is the prolific hydrocarbon producer. Several fields have been produced in this area since 1819 from that particular sandstone, and still producing to date, such as Ledok, Nglobo, and Semanggi. However reservoir continuity is the big challenge to deal with.

Integrated geology, geophysics, and reservoir approach has been used to characterize the Miocene Ngrayong sand. Typical log character from each field, especially in the southern tip of Kening Trough show that there are cycles of coarsening upward sequences in the lower portion, and cycles of fining upward sequences in the upper part of Ngrayong sandstone. A regional well to well correlation display that those events appear broadly, but disappear at Banyubang field in the north. Well to seismic tie confirmed the sequence as small mounded-downlap characters that develop in some areas in Kening Trough, related to the field. Distribution and geometry of that character were analyzed and convinced by seismic attribute analysis and seismic modeling. Moreover, the dynamic data, such as reservoir pressure, production performance, and fluid characteristics, were evaluated to recognize the character differences of dynamic data for each field.

The analyses lead that the Miocene Ngrayong sand is not necessary correlated throughout the area, where every mound represents as a small fan lobe. This will change the exploration and development concept in the area.