

Revisit Play Concept for Eocene-Oligocene Stratigraphic Play in Jatibarang Formation, Onshore North West Java Basin, Indonesia.

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ABSTRACT

Jatibarang Formation was initially found in the late 60-s during exploration project in area what is known as Jatibarang Field. Series of volcanic rocks were found within the structure; consist of andesite lava, tuff and conglomerate. For many years, Jatibarang Field pointed out as the only lithotype reference for most of Jatibarang Formation throughout the Onshore North West Java Basin. The recent exploration program confirmed interesting evidence regarding the non-volcanic layers with terrestrial to transitional depositional environment which initiate the search of revisit play in Jatibarang Formation.

The aim of this study is to identify Eocene-Oligocene stratigraphic play in Jatibarang Formation and how regional tectonic evolution influenced the depositional process within the basin. This play mainly developed during the syn-rift period and located in the depocenter of each sub-basin in Onshore North West Java Basin. Recent 3D Seismic data give a convenient access to evaluate the syn-rift episode using seismic attributes to establish the related depositional environment features.

Prominent half-graben geometry can be recognized in Onshore North West Java Basin with thick syn-rift sediments deposited against the main border fault. Distinct stratigraphic play has been found in this deepest and unexplored portion of Jatibarang Formation with prograding seismic features inside the depocenters which can be classified as part of syn-rift deposits created during the extensional episode in western Indonesia in middle Eocene to late Oligocene. The extensional period let basin filling process from the adjacent horst or local highs to every sub-basin with siliciclastic sediments from terrestrial related environment. Disruption from volcanic activities may related with resettlement of volcanic arc due to reactivation of subduction zone during middle Eocene to Late Oligocene in the southern part of Java which introduced the volcanic materials to the basin. The unexplored play may have related with typical fluvio-deltaic or fluvial fan system in early or mid syn-rift stage. This hypothesis needs to be validated, as per today there are no exploration well penetrated any of these objectives and explained the origins of the sediments within.

Some work has been done to explore stratigraphic play in the shallowest portion of Jatibarang Formation which is possible to be used as analogies for the deep unexplored target. Combination between seismic attributes (RMS amplitude, maximum to minimum amplitude and spectral decomposition) with other well information (mudlog, biostratigraphy, petrography, etc.) concludes typical siliciclastic sediments with tide dominated delta and/or estuarine depositional system in Pondok Makmur Complex. Where in Cemara Area series of conglomerate and sandstone trapped inside thick tuff layers, emerge as meandering rivers inside fluvial fan system in Jatibarang Formation. Both were included as part of transitional and terrestrial depositional environment during late syn-rift setting in Late Oligocene period with influence of volcanic

materials within the sediment (epiclastic). Volcanic activities can also be traced in other part of Onshore North West Java Basin outside Jatibarang Structure and possible to be account as future potential of stratigraphic play by applying volcanostratigraphy concept, but more data is needed to complete it.

In conclusion, stratigraphic play in Jatibarang Formation can be included as part of the future exploration opportunity in Onshore North West Java Basin. Majority of this play type is located in the depocenter of the basin which conceptually kept cycles of siliciclastic sequence during the early and mid-rifting phase which similar or even better than the proven late syn-rift sequence of Jatibarang Formation.