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Please fill in your manuscript title.	Redefining Southeast Asia Syn-rift Source Rock Model for North Malay Basin

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Abstract

Despite the widely acknowledged global importance of lacustrine and fluvio-lacustrine source rock systems, our understanding of the variation in extent, nature and generative potential of these source rocks remains limited. Variable character of these important organic facies is treated too simplistically and variation in generative potential poorly understood. This ultimately results in an over-estimation in the volume and nature of hydrocarbon charge and will impact exploration success. Here we re-evaluate fluvio-lacustrine source systems through detailed organic facies analysis coupled with paleoenvironmental proxies using data from Bongkot field.

We characterise various depositional environments within a study area. Their variabilities are based on palynofacies, sedimentary features and wireline log character. Typing organic facies using detailed geochemistry such as biomarkers, stable isotope and organic petrography. We cross correlate organic facies with palynology and/or other paleoenvironmental proxies to confine depositional environment of source rock. Finally, an up-to-date refined lacustrine and fluvio-lacustrine source rock model was established. This leads to a better understanding of the true nature of depositional systems and how source rocks develop within them.

Based on the result of this study we observed that fluctuation of depositional environment strongly influences the presence, extent, thickness and proclivity of fluvio-lacustrine source rocks. Distribution of true lacustrine source rock is rather limited, in the basin deep area. The key source for hydrocarbon in a study area is a fluvio-lacustrine source rock which are temporally and spatially more widely distributed. Based on our findings we can update source rock models for true lacustrine (deep lake) versus fluvio-lacustrine (shallow lake) in the study area. We have tested and calibrated these source rock models with hydrocarbon discovered in the study area and found them to be reasonable. Future petroleum system modeling should consider using parameter inputs related to fluvio-lacustrine source rock for the most part of AOI, rather than true lacustrine. This will help preventing over-estimation in the volume and nature of hydrocarbon charge.

Here we propose an updated and refined depositional history model and source rock distribution for the Bongkot area. The findings of this study can provide a well proven analogue in support of exploration across Sunda basins allowing a greater in-depth knowledge of the ubiquitous fluvio-lacustrine hydrocarbon charging system. This in turn will allow more precise and defendable hydrocarbon charge analysis when exploring in similar geological setting across the S.E Asian basin Sunda tract.