

# **Integrated Reservoir Quality Assessment of Late Cretaceous- Tertiary Petroleum Reservoirs in Onshore Central Sarawak, Malaysia: Implications from Surface and Sub-Surface Datasets**

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## **ABSTRACT**

The onshore Balingian Province of the Sarawak Basin in Malaysia is an underexplored petroleum province. Recent studies confirmed the presence of possible hydrocarbon source rocks in the province, but very little is known about the reservoir quality of the area. Hence, the aim of this research is to understand the geology and reservoir behaviors of the sandstones in the Balingian and Nyalau Formations, which are speculated as probable reservoirs. Outcrops of these sandstones will be studied to glean sedimentological information and collect samples for laboratory studies. Subsurface equivalents of these formations will be identified from wireline logs, and cores from same interval will be studied for textural parameters, sedimentary structures and trace fossils. Quantitative reservoir parameters will be determined from the outcrop samples, wireline logs and core plugs. Thin section petrography, provenance analysis, bulk clay analysis, inductively coupled plasma mass spectrometry and Scanning electron microscopy will be carried out on subsurface reservoir analogues and core plugs to determine the mineral composition, sediment maturity, clay mineralogy, and their interstitial behaviors in the sandstones. Distributions and thicknesses of these sandstones will be determined from constructed isopach and isolith maps, as well as wireline logs. Datasets obtained from these analyses will be carefully integrated to predict depositional environments, as well as qualitative, quantitative and pore scale reservoir qualities of the Nyalau and Balingian sandstones. The output of this study will bring about prediction of how tested parameters influences reservoir petrophysical parameters, and ultimately enhance ongoing exploration activities in the onshore Balingian Province.