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**COMPARATIVE ANALYSIS OF FACIES AND RESERVOIR
CHARACTERISTICS OF MIRI FORMATION (MIRI) AND NYALAU
FORMATION (BINTULU), SARAWAK**

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ABSTRACT

This study on the sedimentological and reservoir petrophysical properties (porosity, permeability, density, sonic velocity) of sandstones were conducted on the sedimentary rocks belonging to the Miri Formation (Middle Miocene) from Miri and Nyalau Formation (Middle Miocene) from Bintulu in Sarawak. The objectives are i) to investigate and determine the facies characteristics, and reservoir properties of the different types of sandstones, and ii) to establish the relationships between the facies characteristics and petrophysical properties. Three lithofacies have been sampled from the outcrops of Nyalau Formation and four lithofacies from the outcrops of Miri Formation, based on lithology, sedimentary structures, fossil traces and bed geometry. These are grouped to four major lithofacies: (i) Hummocky cross-stratified sandstones (HCS); (ii) Trough cross-bedding sandstones (TCB); (iii) Bioturbated sandstones; and (iv) Swaley cross-stratified sandstones (SCS). Hummocky and swaley cross-stratified sandstones, trough cross-bedded sandstones and some bioturbated sandstones of Miri formation recorded the highest poro-perm values, with relatively lower density values (as compared Bintulu samples). The HCS, SCS and TCB sandstones are well sorted

sandstones, with minimal mud content. This has contributed to the high poro-perm values. The bioturbated sandstone (MF1) shows high permeabilities in some samples, and suppressed, low permeabilities in others. This reflects the heterogeneity in facies characteristic and poro-perm distributions of bioturbated samples. Bioturbated HCS, the HCS and TCB sandstones of Bintulu show moderate poro-perm values. The Nyalau Formation rocks are older, and thus are expected to have undergone more compaction than the younger Miri Formation. This is also reflected in the higher density values recorded for all the Bintulu samples.