

## **Lithofacies sorting of organic matter and its implications for source rock potential**

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The Nyalau Formation (Oligocene-Miocene) was deposited in a coastal deltaic environment. In the north of Bintulu, it has been recognised that the ideal sequence of the Nyalau Formation is a progradational tide dominated sequence, which coarsens upwards from offshore muds to sandstones. The sorting of the coal in the Nyalau Formation into different lithotypes is observed to be related to the associated lithology and is interpreted as the consequence of the processes in the depositional environment. The lithologic diversity is expressed by the maceral composition; coal seams associated with shales are liptinite-rich and those interlayered in the sandstones are vitrinite-rich. However, coal seams interstratified in the thinly bedded sandstones-muds facies show similar maceral composition as the coal associated with shales and sandstones. These variations are seen at different (microscopic and macroscopic) scales, suggesting that conditions of deposition controlled the coal lithotype sorting. This is attributed to the energy of the operating processes within the peat-forming environment. If the deposition occurred during high-energy events such as floods, tides, and wave action the liptinites are flushed and redeposited in the surrounding environments. Subsequently, if the energy of deposition is low, the flushing is inhibited allowing the deposition of a liptinite-rich *in situ* coal seam. The flushing of the organic deposits by the hydrodynamic agents such as floods and tides in lower coastal plain may strongly govern the coal liptinitic contents and consequently its source rock potential.