

***Meandering river deposition in the Morien Group at Alder Point,  
Sydney Basin***

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The Morien Group at Alder Point (West-phalian D to Stephanian) comprises nearly 60% sandstone and siltstone, 38% mudstone and 2% coal. The strata are interpreted as meandering river deposits, and show three distinct associations which represent geomorphic regions of the alluvial plain:

1. (25% of strata): **Trough cross-bedded sandstone**, medium grained, in units 3-5 m thick and up to 18 m thick where multistoreyed. The units are laterally continuous, fine up locally to rippled fine-grained sandstone, and show large-scale epsilon cross-stratification. The association is interpreted as channel and point bar deposits.

2. (25% of strata): **Coarsening-up sandstone**, mainly fine-grained, in units averaging 2.7 m. Features include ripple cross-lamination, lenticular bedding and small-scale channels, and *in situ* tree trunks and roots. Some units show carbonate lenses, bivalves and abundant leaves in the lower parts. The association is interpreted as levee complexes and fluvio-lacustrine sequences.

3. (50% of strata): **Green and red mudstone**,

with interbedded fine-grained sandstone, coal and limestone. Sandstones are rippled and lineated, and desiccation cracks, roots and a few tree trunks are present. The association is interpreted as floodbasin deposits.

Paleocurrent data indicate northeastward transport for the channel sandstones, with high variability reflecting the high sinuosity system. Paleoflow for the levee sandstones was at right angles to this trend, suggesting that floodwater funnelled through small channels into the floodbasin. Floodbasin sandstones show northwestward paleoflow, suggesting that flow in the floodbasin was down the paleoslope.

Several lines of evidence, including the distribution of coals, limestones and carbonate nodules in the red and green mudstones, indicate that the colour of the mudstones was a primary or early diagenetic feature. Peat swamps grew on floodbasin, and terminated by flooding, the advance of levees, or the avulsion of major channels across the swamps.