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**Stratigraphy and paleoecology of the Sydney Mines  
Formation at Morien Bay, Nova Scotia**

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Coastal exposures of the Sydney Mines Formation (Westphalian D) at Morien Bay consist of fluvial, restricted marine, and possibly lacustrine strata, with economic coals. Measured 75–150 m stratigraphic sections at Schooner Pond, Long Beach, and Port Morien include the Emery to Harbour seam interval and record stacked high-frequency sequences approximately 10–30 m thick. The dominant facies association comprises grey sandstone and shale and associated hydromorphic paleosols. The second major facies association includes calcareous paleosols as well as red shale and red and grey paleosols.

Repetition of wetland and dryland facies, representing regressive and transgressive cycles, is observed in all sections and allows for a sequence stratigraphic framework to be applied. Marine flooding surfaces are represented by thick coals and faunal concentrate limestone/shale. Sequence boundaries can be identified by the presence of calcretes and red mudstones. Grey, wetland facies are well represented within the Transgressive and Highstand Systems Tracts. Red and grey dryland facies are represented in the topmost Highstand to Lowstand Systems Tracts. The Falling Stage Systems Tract may also be represented here in some valley fills within highstand deposits.

Forested horizons of calamitacean and lepidodendrid trees standing in their growth position are observed at many levels, with large stigmarian rooting systems. Most horizons were found in grey siltstone and sandstone with small distributary-type channels, implying poorly drained or wetland associations. Abundant compression flora of *Neuropteris*, *Alethopteris*, *Pecopteris*, and *Cordaites* are recorded throughout all sections, mainly in wetland facies but also as rarer litter identified in red beds of the Highstand through Lowstand Systems Tracts. A well-preserved tetrapod trackway was discovered at Long Beach, just below the

Phalen Seam. Located within a shallow gully in a multi-story dryland channel body deposit, this ~3 m long trackway preserves 18 footprints generated in a soft, wet substrate. Rainprints, rill marks, and windblown sand suggest dryland conditions. A smaller set of tetrapod trackways was found higher in the section as well as two separate *Arthropleura* trackways.