
**Stratigraphy, sedimentology,
and depositional setting of the
Lower Cretaceous Chaswood Formation
in the West Indian Road pit, Nova Scotia**

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On the Scotian Shelf, Lower Cretaceous deltaic sandstone reservoirs (Mississauga and Logan Canyon formations) are being exploited for gas and explored for oil. Studies of offshore wells are limited by the restricted availability of samples other than cuttings. Correlative strata on land, the accessible age-equivalent Chaswood Formation, more readily provide information about the source of the sands, the regional paleogeography, and structural history.

The Barremian to Aptian Chaswood Formation is characterized by the alternation of clay and sand units. The fining-upward sequences, the presence of armoured clay balls within the sands and the development of oxisols in the clays strongly suggest a fluvial environment. The occurrence of lignite in some clay units suggests lacustrine or fresh water marsh sedimentation. However, marine fossils (rhizopod assemblages) found in the lowermost clay units indicate the possibility of a marginal marine environment. Consequently, the Chaswood Formation may have been deposited during one or more phases of marine transgression followed by fluvial progradation.

The West Indian Road silica sand pit is the largest exposure of the Chaswood Formation. The deposit is enclosed in a fault-bounded basin within the Carboniferous Windsor Group sedimentary rocks. Two dominant oblique fault systems have N-S and NW-SE orientations. The basal unit, a thick dark lignitic grey clay, lies unconformably on the bedrock. It is overlain by more than 20 m of sand and gravel intercalated with two major clay markers. Faults show evidence of syn-sedimentary movement, with at least two internal angular unconformities within the pit. Both the stratigraphy and the sedimentology of the pit show evidence of a braided fluvial environment of deposition characterized by several fining-upward sequences from gravel lags to sandy beds to vertical accretion-related clay units and a predominance of trough cross-bedded sand and gravel.