

Stratigraphy and Reef Development in the Woodbend-Winterburn Groups, Northwest Territories, Canada.

By

Alex J. MacNeil

University of Alberta, Dept. of Earth and Atmospheric Sciences, Edmonton,
Alberta, Canada (ajm2@telusplanet.net)

Strata of the Late Devonian Woodbend and Winterburn groups are exposed in river gorges and scattered outcrops in the southern Northwest Territories. They are composed of basin-filling shales, reefal (Alexandra Reef Complex) and fossiliferous limestones, deposited on an open marine platform, and mixed siliciclastic-carbonate deposits. They differ significantly from age-equivalent counterparts in Alberta, deposited on the southern and central sides of the then structurally high Peace River Arch.

The relationship between the basin-filling deposits and the reef and carbonate shelf deposits is stratigraphically complex. The diagenetic history is also complex, and includes several types of cementation and at least three types of dolomite.

Objectives of the project include (1) assessment of facies relationships, geometries of organic buildups, and identification of systems tracts, (2) a detailed understanding of reefal development including zonation and paleoecology of the frame builders, (3) assessment of diagenetic fabrics, (4) investigation of the nature and extent of dolomitization, and (5) a detailed sequence stratigraphic model for the Woodbend – Winterburn groups on the northern side of the Peace River Arch.

The project will make significant contributions to our understanding of basin and platform development on the northern side of the Peace River Arch in the Late Devonian. The sequence stratigraphic model, and better understanding of the reef development, will help explain local dolomitization, the distribution of potential source rocks, fluid migration pathways, and potential trapping mechanisms. This will be most important as there is currently no such model for this part of the Western Canada Sedimentary Basin.