

Lithostratigraphic revision of the Upper Carboniferous to Lower Permian strata of the Cumberland and Pictou groups in the Cumberland Basin, Nova Scotia, and the regional implications for the Maritimes Basin

R.J. Ryan, R.C. Bochner and J.H. Calder

Nova Scotia Department of Mines and Energy, P.O. Box 1087, Halifax, Nova Scotia B3J 2X1, Canada

The late Paleozoic strata exposed in the Cumberland Basin part of the larger regional Maritimes Basin of Atlantic Canada have been considered as classic Carboniferous sections since their original description in the mid-1800's (Joggins Section). Stratigraphic nomenclature applied to the Upper Carboniferous strata, which locally exceed a thickness of 7 km, is problematic due to numerous poorly defined or informal units and a confusing mixture of litho-, bio-, and chrono-stratigraphic terminology. The Cumberland Basin is a key area in the regional nomenclature because it contains the type sections of the Cumberland and Pictou groups, and well-exposed sections of strata traditionally assigned to the Riversdale Group (abandoned and constituents incorporated into the Cumberland Group) and Canso Group (abandoned and replaced by the Mabou Group, after Belt, 1964 and 1965).

The constituent formations of the Cumberland and Pictou groups include in ascending order: Cumberland Group - (1) Claremont and (2) Boss Point (both formerly assigned to the abandoned Riversdale Group), (3) Polly Brook (new), (4) Joggins (redefined), (5) Springhill Mines (new), (6) Ragged Reef (new), (7) Malagash (new); and Pictou Group - (8) Balfron (new), (9) Tatamagouche (new), and (10) Cape John (redefined). The resulting revision of the groups is based upon formal formation subdivisions and utilizes lithostratigraphic criteria such as:

composition, occurrence of coal and related strata, predominant colour and grain size, vertical and lateral variation, and stratigraphic relationships. Within the context of the Cumberland Basin the revisions are modest relocations of group boundaries in the type sections: (1) Pictou Group base shifted upsection to exclude the strata of the Malagash Formation, and (2) the repatriation of the Boss Point and Claremont formations to the base of the Cumberland Group. The revised Cumberland Group conformably and unconformably overlies strata of the Mabou Group (Belt, 1964, 1965) and includes all of the grey (dominated), coal-bearing strata in the basin. It also includes greybeds that were previously assigned to the base of the Pictou Group in the type section. Strata previously assigned to all or portions of the Morien Group, Stellarton Group (Formation) and Petitcodiac Group could be reassigned to the Cumberland Group and would avoid the current synonymy at the group level. The revised Pictou Group comprises all of the redbed-dominated, non coal-bearing strata above the Cumberland Group and regionally could include the Pictou Group redbeds in the Gulf of St. Lawrence as well as most of the newly introduced formations of the Prince Edward Island Group. The proposed lithostratigraphic subdivisions (new and revised) and group assignment criteria will facilitate regional correlation and basin analysis within the Maritimes Basin.