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The sedimentary trough which developed between the Mt. Read Volcanic Belt and the Rocky Cape Geanticline to the west is referred to as the Dundas Trough (Campana and King, 1963; Bradley, 1956). South of Macquarie Harbour the trough is filled by two main sequences, the earlier Mainwaring Group and a younger Dundas Group.

The best development of the Mainwaring Group is in the Cypress Creek area and rocks of this group extend from the Urquhart River to just south of Sassafras Creek, where the basal slate of the Mainwaring Group makes contact with the Lewis River Volcanics. Consisting dominantly of intermediate volcanics the Mainwaring Group rocks include andesite, basalt, volcanic breccia, agglomerate, tuff and gabbro. The volcanic suite is generally chloritized, epidotized and sheared. Shales, slates and phyllites comprise a minor constituent of the Group.

The Dundas group is considered a typical turbidite sequence and contains interbedded siltstone, argillite and greywacke. Graded bedding is common and has shown that the outcrops along the west coast from north of Wanderer River southwards to Abo Creek become younger towards the west.

In the Mt. Osmund - Wart Hill area the Lewis River Volcanics are unconformably overlain by the Ordovician conglomerate of the Mt. Osmund syncline which is believed to be a correlative of the Owen Conglomerate of the Mt. Lyell area on lithological grounds. It is reported by Cuffley, 1971 that a thin bed of black carbonaceous siltstone occurs at this unconformity.

The northern boundary of the Lewis River Volcanics is marked by the Moores Fault a major south-east trending feature which brings the volcanics and the overlying Ordovician conglomerate into contact with the Tertiary sediments of the Macquarie Harbour Graben.