

Geology of Quaternary Ilmenite-bearing Coastal Deposits at Westport, South Island, New Zealand

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ABSTRACT

The purpose of the study has been to investigate the geology and mineral content of late Quaternary deposits in the Westport area on the west coast of the South Island, New Zealand, areas covered by parts of the NZMS 1 sheets S23 & 24, S30, and S31.

A succession of interglacial marine, lagoonal, fluvial, and eolian deposits representing the last three interglacial episodes are now stranded on a succession of marine terraces, situated inland of the Holocene deposits of the current coastline. The deposits have been divided into five formations, which rest on platforms cut into Tertiary sediment, the highest (Caledonian Formation), at 300 feet above sea level. The new formations are:

Caledonian Formation – Waiwheran Stage

- 2 Caroline Member (fluvial)
- 1 Kynnersleys Member (marine)

Addison Formation – Terangian Stage

- 2 Shamrock Member (fluvial)
- 1 Skibbereen Member (marine)

Virgin Flat Formation – Oturian Stage

- 3 O'Malley Member (eolian)
- 2 Gillows Member (fluvial)
- 1 Gallaghers Member (marine and lagoonal)

Waites Formation – Oturian Stage

- 3 Pipeline Member (eolian)
- 2 Bradshaws Member (fluvial and estuarine)
- 1 Wilsons Member (marine and lagoonal)

Nine Mile Formation – Aranuiian Stage

- 4 Ferry Member (younger eolian)
- 3 Okari Member (older eolian)
- 2 Westport Member (fluvial)
- 1 Shetland Member (marine)

The history of alluvial goldmining in the area and the previous investigations into the mineral content of the deposits is described. In the current investigation, random sampling of the deposits was undertaken to attempt to determine the ilmenite and zircon content of the formations. Laboratory procedure and results are discussed, and conclusions presented, as well as evidence for mineral provenance.

A classification of the reserves of ilmenite and zircon is given, together with calculations of grading and distribution of these reserves, and a discussion of exploitation problems with brief recommendations.