OVERVIEW OF TASMANIAN TERTIARY BASALTS

John Everard[1], Ming Zhang[2], Ching-Hua Lo[3], Sue O'Reilly[2], Stephen Forsyth[1]
1 *Mineral Resources Tasmania, Australia*
2 *GEMOC Key Centre, Macquarie University, Australia*
3 *National Taiwan University, Republic of China*

Tertiary volcanics, dominantly basaltic lavas, crop out widely throughout Tasmania, apart from the SW, and extend offshore to Bass Basin, the South Tasman Rise and East Tasman Plateau. Centres range from small plugs and dykes to large necks and probable crater fills (The Nut, Table Cape), some forming prominent landforms (e.g., Black Pyramid, Mt Cameron West, Old Mans Head), and have given rise to flows rarely up to 50 km long (Ringarooma and Derwent Valleys). East of Waratah, a lava pile, locally more than 360 m thick has largely buried the pre-volcanic topography. Pyroclastic deposits, although usually poorly preserved, are associated with some shield volcanos (e.g., Weldborough Pass) and diatremes (e.g., Brittons Swamp, Apsley, Upper Esk). Aquagene volcaniclastics are well-developed in the far northwest (a region of relative sea-level regression) and inland in some highland lakes (e.g., Great Lake) or where flows have dammed major streams (e.g., Mersey-Forth region). Twenty-five new Ar-Ar dates supplement previously published K/Ar (8.5-58.5 Ma) and palynological data. The oldest age is now 64 Ma (total fusion) from a tholeiite at Marion Bay. Other notably old Ar/Ar (plateau) ages are from basanites at Glenfern (45.5 ± 1.0 Ma) and Blessington (36.8 ± 0.2 Ma), olivine nephelinite at Beauty Flat (41.1 ± 0.2 Ma) and alkali olivine basalt at Lillicos Beach (37.2 ± 0.2 Ma). Most (13) of the new dates are between 21.4 and 30.3 Ma and include tholeiites at Brighton (25.1 ± 0.3 Ma) and Claremont (26.7 ± 0.3 Ma). The youngest four new ages (16.3-17.5 Ma) are outliers of the Ringarooma alkalic activity in the northeast. The age distribution cannot be clearly linked to any plume beneath the northward-moving Australian plate. The main stem of basalt compositions, from olivine melilitites to quartz tholeiites (SiO_2 37-54%), is attributed to progressively larger degrees of partial melting. Tholeiites show little compositional dispersion and lack primary compositions (Mg# < 65). Undersaturated types are more variable in Na_2O, K_2O, P_2O_5 and incompatible trace elements, perhaps reflecting mantle heterogeneities, and some have fractionated at mantle depths producing lineages to evolved hawaiite, nepheline hawaiite and nepheline mugearite. This poster illustrates physiographic, field, geophysical and petrographic aspects of the basalts, collates previous and new geochronological data, and presents highlights of a new comprehensive major, trace element and isotopic (Sr-Nd-Pb) database which is further discussed by Zhang et al. (2004 this volume).