

Chapter 2

Outline of Geology

The district is situated in a complex zone of intrusions on the boundary between two contrasting structural domains. The rocks are composed dominantly of Mesozoic granites and volcanics (Table 2; Figure 5) which are intruded by a strongly ENE-WSW oriented porphyritic rhyolite dyke swarm.

Palaeozoic sedimentary rocks of the San Tin Group are the oldest rocks in the district and are only exposed on Tsz Kan Chau in the western extremity of the district. These rocks are thermally metamorphosed and belong to the Lok Ma Chau Formation of Carboniferous age. They are thought to occupy a northeasterly-curving but irregular belt up to 4 km wide extending from Chek Lap Kok in the southwest to East Brother in the northeast.

Coarse-ash crystal tuffs of the Yim Tin Tsai Formation (Tsuen Wan Volcanic Group) are stratigraphically the oldest volcanic rocks in the district although they have not been dated. These rocks are unconformably overlain by lapilli-bearing coarse- to fine-ash crystal tuff of the Shing Mun Formation. The internally massive and structureless character of the volcanic deposits suggest that they are the product of large, relatively homogenous, ash-flow eruptions.

Welded lapilli- to block-bearing crystal tuff, tuff breccia and tuffite of the Lantau Formation (Repulse Bay Volcanic Group) is exposed in the extreme southwestern part of the district. These rocks are thought to occupy an ancient caldera forming the central part of Lantau Island. They are assigned to the Repulse Bay Volcanic Group based on whole rock geochemistry and mineralogical characteristics.

The volcanic rocks of the district are intruded by granite, granodiorite, porphyritic rhyolite and mafic dykes. The granodiorite is the oldest of the major intrusions and subcrops in boreholes in the northeastern part of Ma Wan. Granite forms two major plutonic bodies in the southern and eastern parts of north Lantau Island. It is mostly medium-grained with a pronounced porphyritic texture apparent in granite outcrops in the south. Eastnortheast-trending porphyritic microgranite and feldsparphyric rhyolite dykes are the dominant minor intrusive rocks in the district. They are intruded by quartzphyric rhyolite and mafic dykes in the central and northern parts of the district. Mafic dykes up to 5 m wide are generally the youngest intrusive rocks intruding all lithologies except for some quartzphyric rhyolite dykes.

The geological structure of the district is complex owing to the close proximity of intersecting regional fault trends. The dominant fault trend is to the northwest although these faults have been offset by a younger set of north-trending faults in the central region. Quartz veins are commonly associated with these faults and may be up to 5 m thick. There is no evidence for recent movement along any of the faults within the district.

Superficial deposits within the district cover most of the low-lying ground and large tracts offshore (Figure 6). The onshore deposits comprise dominantly debris flow deposits on the higher ground and alluvial sediments on the valley floors. In the larger valleys, these have been disturbed by cultivation.

The offshore superficial deposits consist mostly of marine sand of the Chek Lap Kok Formation and marine mud of the Hang Hau Formation. A small area of Pre-Chek Lap Kok Formation deposits has been identified in the district.

Table 2 - Summary of the Onshore and Offshore Stratigraphy of the District

Stratigraphic Divisions		Lithostratigraphy and Genetic Classification		Principal Materials	Map Sym
Superficial Deposits					
QUATERNARY	Holocene	Fill		Natural earth and waste	Qh ^F
		Estuarine deposits Beach sand		Mud and sand Sand; some gravel and mud	Qh ^{ie} Qh ^{bs}
	Holocene and Pleistocene	Hang Hau Formation	Marine mud Marine sand	Silt, sand, gravel Sand, gravel, cobbles	Qh ^{mm} Qh ^{ms}
		Alluvium Debris flow deposits		Clay, silt, sand and gravel Sand, gravel, cobbles	Q ^a Q ^{df}
Pleistocene	Chek Lap Kok Formation	Alluvium, debris flow deposits, estuarine and marine sediments	Clay, silt, sand, and gravel Sand, gravel, cobbles	Qp ^a Qp ^{df} Qp ^{ie} Qp ^{ms}	
Volcanic and Sedimentary Rocks					
MESOZOIC	Jurassic-Cretaceous	Repulse Bay Volcanic Group	Lantau Formation	Rhyolite lava and tuff	JLT
		Tsuen Wan Volcanic Group	Shing Mun Formation	Lapilli coarse-ash crystal tuff	JSM
			Yim Tin Tsai Formation	Coarse-ash crystal tuff	JYT
PALAEOZOIC	Carboniferous	San Tin Group	Lok Ma Chau Formation Mai Po Member	Metasiltstone, metasandstone; graphite-bearing	Cmp
Major Intrusive Rocks					
MESOZOIC	Jurassic-Cretaceous	Granite Granodiorite			gf, gm gdf
Minor Intrusive Rocks					
TERTIARY		Basalt and lamprophyre			b
MESOZOIC	Jurassic-Cretaceous	Feldsparphyric and quartzphyric rhyolite Porphyritic microgranite and fine-grained granite			rf, rq μg

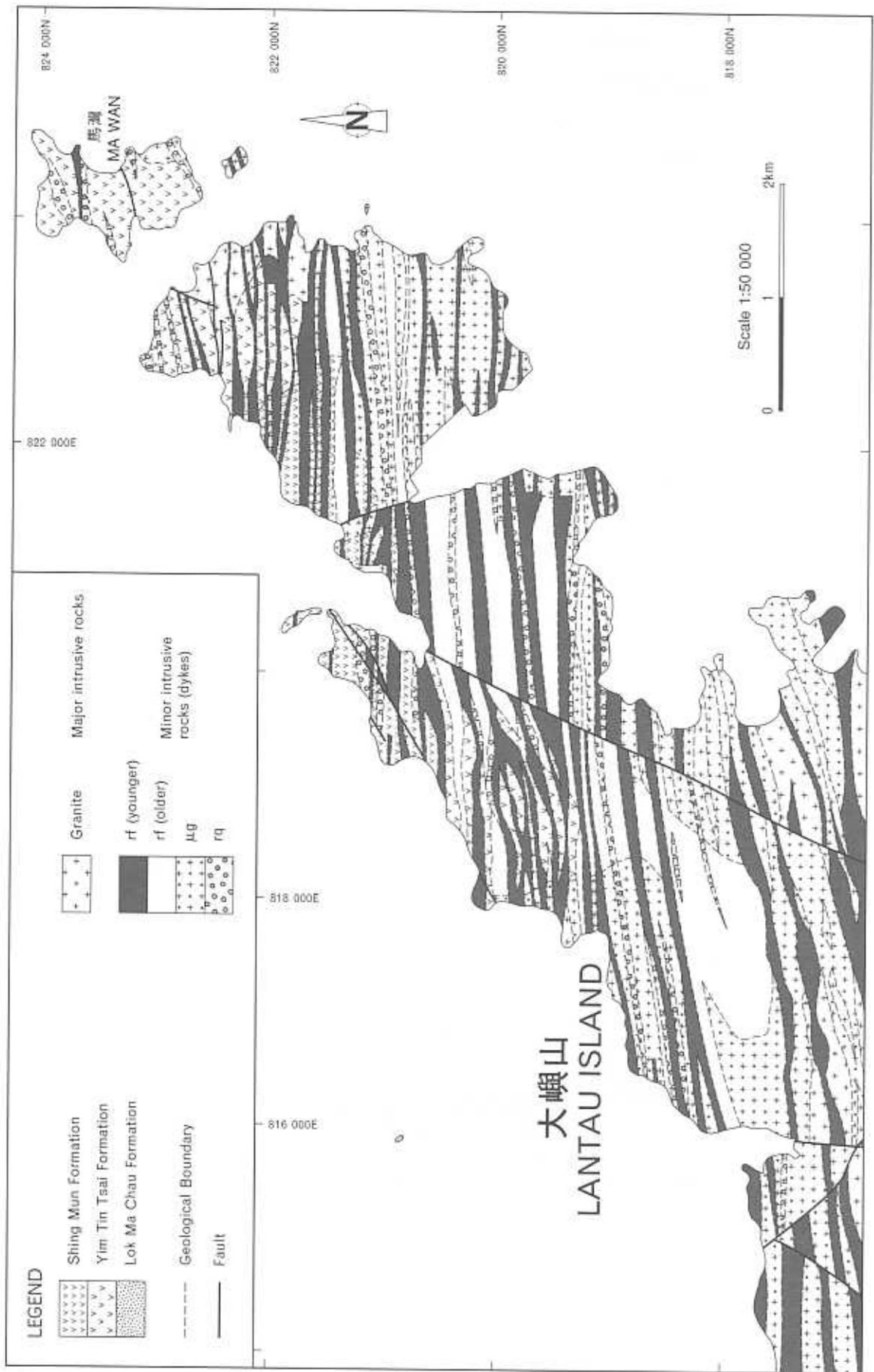


Figure 5 - Simplified Onshore Geology of the District

