Chapter 10
Economic Geology

Economic deposits of the district include non-metalliferous minerals and construction aggregates. Metalliferous mineral deposits are also known mainly from the Sha Lo Wan area and have been extensively prospected. However, none of these metalliferous mineral deposits is of economic or potentially economic proportion.

Non-metalliferous Minerals

Fissure veins of quartz are common throughout the granitic rocks, particularly in those exposed between Sha Lo Wan and Tung Chung. Many of these veins are weakly mineralized (see earlier), although Ruxton (1958) has also noted that some very wide quartz veins, often with open textures and cavities between the crystals, are non-mineralized. The non-mineralized quartz veins are considered to belong to a separate, younger emplacement event.

Quartz was mined from the Sha Lo Wan area between 6.8.55 and 6.3.59, and from 8.1.60 to 7.7.61. However, no records exist on production volumes. Similarly, mining licences for quartz were granted for the Hau Hok Wan area between 15.1.71 and 14.1.76 and again from 26.5.76 to 25.3.85, but there are no records on production volumes. The quartz at Hau Hok Wan was mined from a large (up to 30 m wide), non-mineralized quartz vein on the western side of the bay (0857 1700). Prospecting licences for quartz were granted for the Sha Lo Wan area between 17.10.67 to 16.4.68 and from 25.7.69 to 24.7.74, but no mining licences were sought.

Feldspar was also prospected in the Sha Lo Wan area, mainly from sporadic pegmatites containing small quantities of pink orthoclase. A prospecting licence for feldspar was granted, along with quartz, for the Sha Lo Wan area between 17.10.67 to 16.4.68, and from 25.7.69 to 24.7.74. A mining licence was granted to extract feldspar from the Sha Lo Wan area between 8.1.60 and 7.7.61, but not records on production volumes exist.

A prospecting licence granted for the Sha Lo Wan area between 25.7.69 and 24.7.74, included provision for kaolin prospecting. However, apart from minor deposits associated with weathered granitic rocks, there are no known major sources of kaolin within the district.

Minor quantities of apatite, garnet, topaz, fluorite, diopside, muscovite, biotite and beryl have been reported by Ruxton (1958) and Peng (1978) from veins adjacent to granitic intrusions in the Sha Lo Wan area. These occur sporadically as rich, local concentrations of minerals, sometimes associated with skarn deposits. Ruxton (1958) has cautioned that such mineral occurrences should not be considered as representative of all quartz veins in the area.

Metalliferous Minerals

A variety of metalliferous minerals occurs within the district, mainly in the Sha Lo Wan area. The mineralization occurs as two main types: 1) High temperature (pneumatolityic) mineralization associated with interlacing quartz veins at the contacts between granite intrusions and host rocks, and 2) Moderate to low temperature mineralization associated with eastsoutheast–westnorthwest trending quartz veins. The metalliferous minerals include arsenopyrite, chalcopyrite, galena, magnetite, molybdenite, pyrite and wolframite. Minor quantities of pyrrhotite and scheelite have also been reported (Peng, 1978; On Yang, 1979). Ruxton (1958) described similar minerals from both the high temperature and low temperature quartz veins, with the exception of galena which was only described from the low temperature veins. However, according to a stream sediment geochemical survey in the Sha Lo Wan area by Nau and Yim (1977), the sources for arsenic, tungsten, and copper, were thought to be the contact between granite and country rocks, whereas that for iron, manganese and zinc was considered to be farther to the southwest. The presence of a skarn deposit at San Shek Wan (Peng, 1978) immediately to the west of the district suggests a possible explanation for the source of these metals as well as for the variety of non-metalliferous minerals present. Sewell (1999) has reported similar anomalous concentrations of arsenic (3 – 35 ppm) and tungsten (9 – 80 ppm), as well as moderate to high levels of antimony (3 – 4 ppm), bismuth (15 – 73 ppm), and tin (7 – 57 ppm). By contrast, concentrations of iron (Fe_2O_3<2 wt%), manganese (MnO<0.10 wt%) and zinc (<40 ppm) are relatively low.

Prospecting licences were granted for tungsten and iron in the Sha Lo Wan area (0901 1584, 0896 1564, 0885 1570) from 17.10.67 to 16.4.68 and from 25.7.69 to 24.7.74. Mining licences for the same area were granted for wolframite and associated minerals from 8.11.54 to 7.5.58, and from 19.3.55 to 18.9.57, but no records of production exist.

Magnetite has been reported by Peng (1978) 1 km west of Tung Chung in a quartz vein in granite (0930 1710). A similar occurrence of magnetite has also been reported by Peng (1978) from Ngau Au (1010 1530) near Tung Chung.

Construction Materials

Urban development at Tung Chung, combined with the creation of the international airport and Lantau Expressway, has involved large areas of new reclamation. Although the bulk of the material for reclamation has come from outside the district, small borrow areas have been developed. The history of reclamation for the international airport and the nature of the fill materials used, are described in detail in Pinches *et al.* (2000) and references therein.

A regional seismic survey for offshore sources of sand for use in reclamation fill (Seamat Study, Cheung & Shaw, 1993) did not reveal any economic reserves of sand in the district.