

GEOHERMAL PROSPECTING IN THE SEMPORNA PENINSULA WITH EMPHASIS ON THE TAWAU AREA

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Thermal manifestations in the Semporna Peninsula include hot springs, seepages, mud pools and old steaming ground. Mapping of these thermal features showed that they are structurally controlled.

The chemistry of the thermal waters indicate the presence of two types of waters - near neutral sodium chloride and sulphate waters. Thermal waters from the Apas Kiri area are near-neutral sodium chloride waters and the Cl/B and Cl/F ratios suggest they have a common source of geothermal fluid. The thermal water from upper Tawau is acid sulphate type and its chemistry suggest it is steam-heated water or ground water mixed with gas (H₂S). The chemistry of thermal waters from Balung and Sungai Japun areas suggests they are acid sulphate waters which may have come from a far away source and come into contact with and neutralised by cold ground water. The upper Tawau and Balung springs may indicate the perimeter of a field centered on the Marta Volcanic Complex.

The Apas Kiri area is underlain mainly by Quaternary dacitic lava, tuff and agglomerate. The surface thermal manifestations cover an area of 3 km². The volcanic rocks are calcitised, chloritised, argillised and pyritised. Around the thermal features, the rocks are strongly argillised and calcitised.

Several characteristics of the Apas Kiri thermal waters e.g. chloride, Cl/B ratio and geothermometer suggest high subsurface temperature. The Cl/B ratio also suggests the reservoir rocks are andesitic. Total heat loss from the Apas Kiri 2 area has been tentatively estimated at 28.65 MW-Thermal.

The best geothermal prospect so far identified is the Apas Kiri area and it should be further prospected by geophysical methods, in particular geoelectric sounding with large electrode spacing. Measuring of flow rates, additional sampling and analysis of thermal discharges in the upper Tawau area should be carried out. Other known thermal manifestations in the upper Balung area should also be sampled and analysed.