GENERAL GEOLOGY AND ELECTRICAL IMAGING STUDY AND GROUNDWATER QUALITY IN THE VICINITY KG. TANJUNG LABIAN, LAHAD DATU

NAME : AHMAD ZARIF BIN KALDAN
SUPERVISOR : MOHAMED ALI YUSOF BIN MOHD HUSIN
PROGRAMME : GEOLOGY
YEAR : 2016

Electrical resistivity imaging studies and analysis of groundwater quality were conducted around the Cape of Labian which includes two geo electrical survey lines and determination of the quality of the groundwater. The study area consists of Quartenary alluvial sediments, Togopi Formation and Ganduman Formation. The Ganduman Formation typically consists of alternating layer of sandstone rich with carbonaceous material and calcareous claystone while Togopi Formation composed of limestone with marls and clay containing large foraminifera and coral deposits. Petrographic studies shows limestone of the Togopi Formation is classified as Biosparite while concretion from the Ganduman Formation classified as Quartz-Micrite. Analysis of geological structures show that the main deformation of study area is in the northwest-southeast direction. The geophysical survey involved survey line 1; Borehole-3 (GPS: N 5°10'2" E 119°14'5") and survey line 2; Borehole-1 (GPS: N 5°10.036' E 119°13.946). The geo-electrical study was conducted using Schlumberger configuration and Induced Polarization (IP) by ABEM Terrameter LS with the aid of RES2DInv data processing software. The result showed there was occurrence of salt water intrusion at survey line 1. Survey line 1 consisting of alluvium and the Togopi Formation detected intruding salt water at a distance of 160 meters from the coast. The range of salt water resistivity obtained is between 0.55-4.2125 ohm meter and chargeability range between 11.11-19.9563 meter second. The water quality analysis found that water sample BH-1 did not meet the water quality standard of the Ministry of Health Malaysia with excess concentration of Al, As, Fe, Na, Se and Ca while water sample BH-2 is the most contaminated with high content of Al, As, Cr, Fe, Mn, Na, Ni, Se, Ca and Cl. The last sample which is water sample BH-3 was also contaminated with the contents of Al, As, Mn, Na, Se, Ca and Cl that do not meet the conditions set by the Ministry Of Health. Thus the study found that the occurrence of salt water intrusion in the area around the Cape of Labian, can promote the mixing of fresh water and salt water forming brackish water and at the same time lead to groundwater contamination that eventually limits ground water resources for the study area.