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**GROUNDWATER INVESTIGATION IN KUALA SELANGOR USING VERTICAL
ELECTRICAL SOUNDING (VES) SURVEYS**

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ABSTRACT: Integrated geoelectrical and geochemical surveys were used to investigate and delineate different types of groundwater in Kuala Selangor alluvial aquifer. Previous hydrogeological borehole investigation shows that this aquifer contains several types of groundwater in relation to its salinity. The high salinity of the groundwater in some areas is believed to be due to either saltwater intrusion from the nearby sea or river infiltration during high tide season. Vertical electrical sounding (VES) method was employed to study and map the subsurface variation of resistivity in the area. For each sounding measurement, a total spread length of 300 m was obtained with vertical depth penetration of about 100 m. Chemical analysis of the groundwater samples taken from both shallow and deep boreholes was carried out for the water quality determination. A total of 45 VES stations were successfully established along three parallel roads with direction almost perpendicular to the coastal line. The distance between stations varies from 1 to 2 km with a maximum length of about 60 km surveyed line. Results of the vertical electrical soundings as well as the chemistry of the groundwater samples show that groundwater in the

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study area can be grouped into fresh groundwater (resistivity $>48 \Omega\text{m}$) and brackish groundwater ($<48 \Omega\text{m}$). The subsurface resistivity sections derived from the VES study suggest that the area is dominated by brackish groundwater zones especially in the area towards the coastal line. This result appears to agree well with the groundwater pumped from boreholes scattered in the area. Water drawn from boreholes near the coast shown higher salinity compared to the water pumped from inland boreholes. Chloride values greater than 250 mg/L are considered to represent the brackish water zone whilst values less than 250 mg/L represents zones of fresh groundwater.