

## **Geophysical Investigations Using VES and TEM to Delineate Freshwater/Saline Water Interface at the Keta Strip, Central Region, Ghana**

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The Keta Strip is a narrow strip of land of about 20 km long and approximately 2.5 km width located in between the Gulf of Guinea and the Keta Lagoon. The salinity of oceanic is 35 ‰, whereas the Keta Lagoon is characterized by brackish water with salinities in the range of 15-22 ‰. The topography of the strip ranges between 0 and 7 m, but is generally less than 2 meter and below sea level. The groundwater reservoir is a thin, perched freshwater lens that is vulnerable to seawater intrusion and brackish water from the lagoon. Intensive vegetable farming, irrigated from hand-dug well is the main occupation of the people. However, the establishment of shallow mechanized boreholes and the steady increase in population have resulted in increasing demand on the groundwater resources. As a result of this, detailed geophysical survey was carried out in order to monitor the freshwater/saline water interface in a cross section of the study area east of Anloga at the western part of the strip. The survey included vertical electrical soundings (VES) and transient electromagnetic soundings (TEM). The geophysical survey indicates that the geometry of the freshwater/saline water interface is irregularly shaped and is located 35 m below sea level at the central portion of the strip and is relatively steep towards the sea whereas the slope of the interface is very gentle towards the lagoon. This was confirmed from lithological and gamma logs conducted in the boreholes. Electrical conductivities (EC) measurements during the year showed clear variability in values of between 200 and 33,000  $\mu\text{S}/\text{cm}$  and indicate partial intrusion of brackish water in the topmost part of the freshwater aquifer.

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