Groundwater investigation using time-domain electromagnetic (TDEM) method in Alkhoud area, Oman: Implications for seawater intrusion

Muhammad Younis Khan[1], Osman Abdallah[1], Bader Hilal Al-Shaqsi[1], and Said Mohsin Al Abri[1]

[1]*Deptt. of Earth Sci., College of Science, Sultan Qaboos University, Muscat, Oman*

[*]*Email: m.khan1@squ.edu.om*

Alluvial aquifer system along the coast of the Gulf of Oman fulfils one-third of the country's groundwater demand. However, such freshwater aquifers are threatened by the sea water intrusion. Surface geophysical method (Time Domain Electromagnetic (TDEM)) was used for the assessment of groundwater resources and sea water intrusion at Al Khoud area, Oman. The main objective of our work was to map the groundwater table of the alluvial aquifer, and resolve the interface between fresh and saline water. Geophysical soundings provided high resolution information on the spatial distribution of the salt water intrusion, aquifer zones, their thicknesses and lithological units. The coastal aquifer can be characterized by gravels, and clayey gravels. Thus, TDEM proved to be an effective geophysical technique with relatively large depth (>70m) detection capability as compared to other tools for assessment of freshwater resources and mapping sea water intrusion.