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Electromagnetic (EM) and Electrical Resistivity Tomography (ERT) Geophysical Studies of Environmental Impact of Awotan Dumpsite in Ibadan, Southwestern Nigeria

This study established the level of contamination caused by the decomposition of wastes by defining the lateral distribution and the vertical limit of leachate induced zone of anomalous conductivity distribution within the subsurface through the analyses of Electromagnetic (EM) and Electrical Resistivity Tomography (ERT) data, generated from the integrated geophysical survey over Awotan landfill dumpsite, in Ibadan, southwest Nigeria. Nine (9) EM and ERT profiles each were established within and around the Awotan landfill site. EM data were acquire at 5 m station interval using 10 m, 20 m and 40 m inter-coil spacings, while ERT stations were occupied at 2 m electrode spacing using dipole-dipole electrode configuration. The near perfect agreement between the two sets of data generated from the EM and ERT surveys over the Awotan landfill site as well as the subsurface imaging ability of these geophysical methods to delineate the region of elevated contamination presented in the form of anomalously high apparent ground conductivity and low subsurface resistivity distribution, suggest the importance of integrating electromagnetic and electrical resistivity investigation techniques for environmental studies and more importantly for selecting appropriate landfill dump site location such with ability to retain the generated contaminants and thus prevent environmental pollution.

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