

Evaluation of Possible Cause of Low Resistivity Values in Karadiyana - Borupone Dump Site

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ABSTRACT

DC resistivity studies that were conducted at Karadiyana-Borupone dump site gave extraordinary low resistivity values that are lower than that of water-logged clay formations. Resistivity data that were collected in 1-D, 2-D and 3-D modes gave similar results that are mutually consistent with each other. The outcome of very low resistivity values at near surface depths of the dump site demands evaluation of possible cause of the low resistivity values at the site.

Keeping in-line with this set objective, 22 leachate samples were randomly collected from different locations at the dump site to determine the physico-chemical parameters pH, Electrical Conductivity (EC), Total Dissolved Solids (TDS), chloride, sulfate, nitrate, fluoride, magnesium, calcium, sodium, potassium and heavy metal contents (Cu, Zn, Ni, Pb, Cr, Fe and Mn), in order to identify the possible cause of low resistivity values. In addition, optical microscopic studies were carried-out to identify suspended matter of the leachate.

The correlation between low resistivity values and leachate was confirmed by physico-chemical analysis of leachate samples collected from the site and optical microscopic analysis confirmed the availability of clay mixed with partially decomposed waste material.

It is concluded that the presence of high concentration of different inorganic ions in leachate mixed with partially decomposed waste and clay materials are the agents for low resistivity values at the dump site. Particularly, high concentration of sodium and potassium contained in leachate could decrease the ER (Electrical resistivity) value at the dump site due to dispersion of clay particles.
