

# **Leachate Characterization and Assessing its Impact on Soil and Groundwater Quality of the Municipal Solid Waste Dump Site in Bandarawela, Sri Lanka**

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This study was conducted at *Bandarawela* municipal solid waste dump site which 20 tons of waste are disposed daily. Up to the date no one has assessed the impact on soil and ground water quality of the site. This study aimed to characterize leachate and to analyze the quality of soil and water around the site. Physical-chemical parameters and heavy metals were measured using 12 leachate samples, 10 groundwater samples and eight soil samples. The samples were collected within consecutive three months. The resulting values for the Chemical Oxygen Demand, Phosphorus and Iron (Fe) of the leachate are above the tolerance limits for the discharge of industrial wastewater into inland surface waters. According to the results, ranges of the analyzed parameters of the leachate are pH: 5.95-8.36, Nitrate: 2-80 mg L<sup>-1</sup>, Electrical Conductivity: 284.5-32500 μS cm<sup>-1</sup>, Phosphate: 9.9-435 mg L<sup>-1</sup>, Total hardness: 200-1000 mg L<sup>-1</sup> as CaCO<sub>3</sub> and Total Alkalinity: 833-49333.33 mg L<sup>-1</sup> as CaCO<sub>3</sub>. Electrical conductivity, Total Dissolved Solids, Hardness, Alkalinity, Chloride and Chemical Oxygen Demand showed relatively lower values with high rainfall than lower rainfall. The result also showed most of the groundwater samples were within the accepted limits for Sri Lankan Standards for potable water (2013) except for tube wells. In tube wells, Nitrate, Total Alkalinity and Manganese concentrations are above the tolerance limit and pH value is below the limit. The results indicated that the pH value of the soil samples were in alkaline nature within the range of 7.89 to 8.86. The study concludes that the leachate produced from the dump site is not suitable to release to the land surface. It is recommended to have an appropriate system for the collection and treatment of leachate.

*Keywords:* Municipal solid waste, Leachate, Open dumping, Groundwater