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INFLUENCE OF TOTAL PRECIPITATION AND AIR TEMPERATURE ON THE COMPOSITION OF MUNICIPAL LANDFILL LEACHATE

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Abstract

Municipal waste landfill leachate results in different stages of waste stabilization and has a negative impact on the environment. When implementing a new policy on waste handling, monitoring landfill leachate should be carried out under conditions of a modern solid waste landfill. The paper discusses the quality of leachate observed in old and recently built landfills in Vilnius - the capital city of Lithuania. The landfills are situated at a distance of 20 kilometres from each other. Therefore, meteorological information has been taken from one station only. With reference to qualitative research into leachate considering seasonality, the conducted investigation mainly focuses on determining the dependence of landfills on air temperature and precipitation. The composition of leachate in landfills may differ depending on the degree of leachate stabilisation and a seasonal increase in quantity as well as on the influence of changing climatic conditions. The article presents 24 samples of most frequently analysed pollution parameters systematically identified on a seasonal basis. The analyzed parameters of Cl, SO₄, NH₄, Zn and Ni have showed significantly higher values when rainfall is lower, and vice versa. The carried out statistical analysis have included Pearson correlation coefficients varying from 0.588 till 0.997. Also, the impact of precipitation has been observed, however, it has been established that air temperature has no influence on leachate characteristics in the old landfill in Kariotiskes.

Key words: leachate, meteorological conditions, municipal landfill, waste.

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