



“Gheorghe Asachi” Technical University of Iasi, Romania



CHARACTERIZATION OF FIRST FLUSH IN URBAN HIGHWAY RUNOFFS

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Abstract

Samples were collected for six months (nine storm events) to observe the contaminant loads from three highway segments at Rawalpindi, Pakistan. The contaminants analyzed include total suspended solids (TSS), total dissolved solids (TDS), total nitrogen (TN), chemical oxygen demand (COD), total organic carbon (TOC), total phosphorous (TP), sulphate (SO₄), chloride (Cl⁻), iron (Fe), copper (Cu), zinc (Zn), lead (Pb), and chromium (Cr). Mass vs. volume [M (V)] curves were drawn to investigate and calculate the extent of first flush at the sites selected. The results showed that the contaminant loads at 25% (FF₂₅) and 30% (FF₃₀) of initial runoff volume to be 40 and 44% of the contaminants on average, respectively. Hence, proving the existence of first flush, but questioning the previous definitions. TSS and COD were found to be the dominating parameters in the first flush quality, whereas among the heavy metals Fe and Cr were observed higher. The study not only endorse the existence of first flush but also revealed first flush, to be an unavoidable component of stormwater management, as it had the elevated values of contaminant load.

Key words: event mean concentrations (EMCs), first flush, first flush coefficient, highway runoff quality

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