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Characterisation of storm runoff contamination from a tropical urban residential area in Malaysia
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Abstract
It has been quite a long time since the Malaysian government endorsed the Urban Storm Water Management Manual (USWMM) in 2000. Until now, there is no proper and detailed database on the non-point source contamination characteristics from various land uses in tropical regions of Malaysia. As such this study was conducted to fill part of the information gap pertaining to the nature of runoff quality in the tropical regions. The combined sewer outfall of a 6.14 ha residential area in Malaysia was studied to characterise the urban runoff quality generated due to tropical rain. As the drainage outlet discharges sullage and storm runoff through the same drainage network, hourly flow pattern and contaminant concentrations were determined both for sullage and storm runoff. Basic statistical analysis was conducted to determine the mean, standard deviation and event mean concentration values for the study area, for which such data was not available. It was observed that the runoff generated from the area is polluted due to high total suspended solids (TSS), biochemical oxygen demand (BOD) and chemical oxygen demand (COD). The runoff contained more total organic carbon (TOC) than total inorganic carbon (TIC). The EMC values of BOD, COD, TSS, TOC, total Kjeldhal nitrogen, ammoniacal nitrogen and orthophosphate were 35, 168, 177, 11, 0.32, 0.54, 0.16 mg/L, respectively. The presence of heavy metals in the runoff was low. The EMC values of lead, zinc, nickel, cadmium, chromium and copper were 0.061, 0.358, 0.002, 0.002, 0.025 and 0.022 mg/L, respectively. Due to the high quantity of rainfall, a significant amount of annual contamination loading is generated from the nonpoint sources of the residential area.

Author Keywords
contamination loading; event mean concentration (EMC); non-point source contamination; residential area; tropical area; urban runoff quality

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