

Physico-chemical characteristics of sediment accumulated in settling basin of a filtration best management practice

Soyoung Lee, M.C. Maniquiz, Byungsik Lee, Leehyung Kim*

*Department of Civil & Environmental Engineering, Kongju National University,
275 Budaedong, Seobukgu, Cheonan, Chungnamdo, 331-717, Korea
email: leehyung@kongju.ac.kr*

Received 25 September 2009; Accepted 25 January 2010

ABSTRACT

Transport of constituents by stormwater runoff from paved surfaces in urban areas can directly affect the water quality of receiving waters and soils. Metal elements are the most evident constituents associated with particles found in stormwater runoff and the mitigation of its impact considers best management practices (BMPs). Physical treatment facilities such as filtration and sedimentation systems are typically applied to remove the particles and associated pollutants carried by the runoff. Hydrological characteristics of runoff as well as the physical and chemical characteristic of the particles influence the performance of BMPs. In this study, the size distribution of accumulated sediment and associated heavy metals in different particle size fractions generated specifically from the settling basin of a filtration BMP located at the Vehicle Registration Office parking lot in Samgadong, Yongin City, Kyunggi Province, Korea were determined. The highest fraction of particles collected from the basin was in the 425–2,000 μm size range. The greatest metal concentrations are higher with decreasing particle size fraction. X-ray diffraction analysis revealed that most of the particulates were originated from the pavement materials due to surface abrasion and transported by the stormwater runoff.

Keywords: Best management practices; Metals; Particle size; Sediment; X-ray diffraction (XRD)

* Corresponding author.