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Leaching of Particulate and Dissolved Organic Carbon from Compost Applied to Bioretention Systems

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Compost is used in bioretention systems to improve soil quality, to promote plant growth, and to remove metal contaminants from stormwater. However, compost itself, particularly when applied freshly, can be a source of contamination of the stormwater. To test the potential contamination caused by compost when applied to bioretention systems, we continuously leached a compost column with water under unsaturated conditions and characterized dissolved and particulate organic matter in the leachate. Freshly applied, mature compost leached up to 400 mg/L of dissolved organic carbon and 2,000 mg/L of suspended particulate organic carbon. It required a cumulative water flux of 4,000 mm until concentrations of dissolved and particulate organic carbon declined to levels typical for surface waters. Although, dissolved and particulate organic carbon are not contaminants per se, they can facilitate the movement of metals, thereby enhancing the mobility of toxic metals present in stormwater. Therefore, we recommended that compost is washed before it is applied to bioretention systems.

Keywords
compost; leachate; alkali extract; dissolved organic carbon; flux