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Stormwater filtration: factors affecting design and predicting performance

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Summary

Filtration often is used to reduce the pollutant load in stormwater runoff prior to its discharge to surface waters or to groundwater. Many filter media have been investigated for their potential to remove targeted pollutants from runoff water and retain them on the media. However, limited work, in general, has been performed on the mechanistic issues related to stormwater filtration. Stormwater filtration poses unique challenges to the filtration process, making it unlike the filtration of industrial or municipal wastewater. Stormwater runoff treatment is an intermittent process with unpredictable flows and loading rates, as well as potentially variable pollutant loadings. In addition, stormwater runoff contains multiple pollutants, all of which may require reduction/removal in order to meet government permit limits. This presentation will focus on the work of Dr. Clark's research group in improving our understanding of the various factors that influence the effectiveness of stormwater filters in the urban environment, including the impacts of the size of particulate-bound pollutants, the valence charge of the pollutants and their complexes, the potential for anaerobic sites to develop in the media, and the impact of road salts on the transport of metals in stormwater filters.