



Two stage filtration for stormwater treatment: a pilot scale study

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ABSTRACT

This paper presents the results of the granular medium filter and membrane (Ultra Flo membrane) filter experiments conducted with raw stormwater collected from a stormwater canal at Carlton, in Sydney. The filter medium experimented were granular activated carbon (GAC), anthracite and sand. Each was used as a single medium in a 1 m filter column. The filter columns were operated at filtration velocity 10 m h⁻¹. The GAC filter column was capable of significantly reducing the influent dissolved organic carbon (DOC) concentrations. After GAC filtration of stormwater, the average concentration of DOC was 1.76 mg l⁻¹, measured using LC-OCD, which represents a 70% removal of all types of organic. Membrane filtration removed a small additional amount of organics. The GAC filter as a pre-treatment to membrane filtration performed effectively with significant removals in most heavy metals although their influent concentrations were low. The treatment train of GAC filter column followed by membrane filtration was able to reduce the turbidity by 99%. The GAC filter by itself was able to reduce turbidity to an average of 84%. The GAC filter by itself and with the membrane filter both achieved turbidity levels below the ADWG (2004) limits of 5 NTU.

Keywords: Filtration; Membranes; Stormwater; Water harvesting; Organics; Turbidity

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