

Water quality of membrane filtered rainwater

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ABSTRACT

Although most Australians receive their domestic supply from reticulated mains or town water, there are vast areas with very low population densities and few reticulated supplies. In many of these areas rainwater collected in tanks is the primary source of drinking water. Heavy metals are a concern as their concentration in rainwater tanks was found to exceed recommended levels suitable for human consumption. This paper reports on experimental investigations where rainwater collected from a typical domestic roof in Sydney, Australia was treated in two stages of filtration including granular activated carbon (GAC) as a pre-treatment adsorption filter media and a metallic membrane from Steri-flow Filtration Systems Pty. Ltd. The quality of the treated rainwater was compared against the drinking water standards to determine its suitability as a supplement for potable water supply. The pollutants analysed were heavy metals, total coliform and faecal coliforms, total organic carbon, total suspended solids and turbidity. The results indicate that before treatment, the rainwater already complied with many of the parameters specified in drinking water standards. The metallic membrane performed well in removing suspended particles and heavy metals from the rainwater. The performance of the metallic membrane is greatly improved by the use of pre-treatment such as GAC which was used in this experiment.

Keywords: Rainwater; Membrane filtration; Granular activated carbon; Adsorption; Heavy metal; Nutrient

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