



Reviewing factors affecting the effectiveness of decentralised domestic wastewater treatment systems for phosphorus and pathogen removal

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ABSTRACT

Environmental pollution and risks to human health can result from diffuse sources of pollution originating from decentralised wastewater treatment systems (DWTS). In particular, phosphorus pollution can lead to eutrophication and the downgrading of the quality of water bodies, for example, under the Water Framework Directive in the EU, and pathogen pollution can result in increased risks of human exposure to pathogens and impacts on industries such as shellfish growing and tourism. The study reported in this paper reviews the effectiveness of various DWTS in removing phosphorus and pathogens from on-site systems. It was found that DWTS are typically not designed to specifically treat these pollutants, and the most common type of DWTS, septic tanks, provides only basic treatment. Additional treatment such as filtration-based or wetland systems must be used to achieve desired levels of treatments. The performance of these systems is affected by site-specific conditions, such as input load and sources, and climatic conditions, and as such operational characteristics and treatment measures must be designed to take account of these factors.

Keywords: Domestic wastewater; Pathogen removal; Phosphorus removal; Septic tanks; Wastewater treatment; Wetlands; Filtration-based treatment systems

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