The evaluation of technologies for small, new design wastewater treatment systems

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ABSTRACT

Life cycle costing of small wastewater treatment systems can often be generic and lack a degree of detail that could affect the choice of system. Critical factors such as variations in loading, location and discharge limits are sometimes not given the required weight of importance, and as a result the most suitable, most economical system may not always be implemented. A decision support tool for small, new design wastewater treatment plants has been developed that accounts for variations in several parameters such as scale, discharge limits and sludge disposal. Capital and operational costs have been combined to produce life cycle models for six treatment systems. Each system was assessed in a number of scenarios with variations in scale, discharge limits and sludge disposal route. The results show that in most scenarios, constructed wetlands represent the most economical option where surface area is not restricted. For each system, the percentage contribution of labour to the total operational cost increases as agglomeration size is reduced.

Keywords: Wastewater treatment; Capital and operational expenditure; Life cycle costs; Scenario-specific conditions; Discharge limits