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Constructed wetlands with horizontal subsurface flow in the Czech Republic: Two long-term case studies

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ABSTRACT

Constructed wetlands have been used for treatment of municipal and domestic sewage in the Czech Republic since 1989. At present, nearly 250 constructed wetlands (CWs) are in operation and all CWs have been designed with horizontal sub-surface flow. The present study describes long-term treatment performance of two systems. Constructed wetland at Žitenice treats domestic sewage from 6 PE and was put in operation in 1993. Single bed with the surface area of 18 m^2 is filled with gravel (4–32 mm) and in the beginning it was planted with Common reed (*Phragmites australis*). Constructed wetland at Čistá was built in 1994 for 800 PE and combined sewer system. Four beds with a total surface of 3,040 m^2 are filled with crushed rock (4–12 mm) and planted with Common reed and Reed canarygrass (*Phalaris arundinacea*). The evaluation of the treatment performance presented in this paper is based on the periods 1994–2004 and 1995–2007 for Žitenice and Čistá, respectively. The results represent a "typical" treatment efficiency achieved in horizontal flow CWs — high removal of organics (BOD_5, COD) and suspended solids and low removal of ammonia and phosphorus. However, in both constructed wetlands BOD_5 and TSS are the primary target and therefore the design was set to meet these requirements. The system at Čistá is a good example of the ability of HF constructed wetlands treat wastewaters with low organic load. The results presented in this paper indicate that horizontal flow constructed wetlands are a suitable alternative for treatment of wastewater from small sources of pollution when organics and suspended solids are the primary target.

Keywords: Common reed; Constructed wetlands; Czech Republic; Sewage

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