



“Gheorghe Asachi” Technical University of Iasi, Romania



LONG-TERM TREATMENT EFFICIENCY OF A HORIZONTAL SUBSURFACE FLOW CONSTRUCTED WETLAND AT JIMLÍKOV, CZECH REPUBLIC

Jan Vymazal

*Czech University of Life Sciences in Prague, Faculty of Environmental Sciences, Department of Applied Ecology,
Kamýčká 129, 165 21 Praha 6, Czech Republic
E-mail: vymazal@yahoo.com; Phone: +420 22438 3825*

Abstract

The present study is aimed at a long-term treatment performance of a constructed wetland with horizontal subsurface flow at Jimlíkov, Czech Republic. The system was put in operation in 1993 and the treatment performance is evaluated for the period 1998-2009 due to non-existence of results from the beginning of operation. The parameters of concern were BOD₅ (biochemical oxygen demand), COD (chemical oxygen demand), TSS (total suspended solids), NH₄-N (ammonia-N) and TP (total phosphorus). A total of 69 sampling campaigns have been taken into consideration with 35 samples taken during the winter period (November-April) and 34 samples taken during the summer period (May-October). The average outflow concentrations of BOD₅, COD, TSS, NH₄-N and TP were 3.3 mg/L, 27.4 mg/L, 7.1 mg/L, 3.3 mg/L and 1.0 mg/L, respectively and the respective removal efficiencies amounted to 96%, 87%, 93%, 88% and 75%. The outflow concentrations of parameters which are regulated by discharge standards were easily met for BOD₅, COD and TSS throughout the evaluated period. There was no significant difference between the outflow concentrations of monitored parameters during summer (May-October) and winter (November-April) periods. The results revealed that treatment performance of CW Jimlíkov was very high and steady during the 12-year monitoring period and that all discharge limits set by water authorities were met despite the fact that CW Jimlíkov was built among the first constructed wetlands in the Czech Republic with limited knowledge on the design.

Key words: constructed wetlands, Czech Republic, horizontal flow, organics, nutrients

Received: January, 2011; Revised final: April, 2012; Accepted: April, 2012
