Silkeborg Municipality

October 1, 2009

Task G, 4th delivery: Publication submitted to the 5th International Conference on Sewer Processes and Networks

Contract text to which the deliverable refers:

Technical publications: Publications are submitted for presentation at the 5th International Conference on Sewer Processes and Networks in Delft in 2007 and the 11th International Conference on Urban Storm Drainage in Edinburgh in 2008. 2 technical publications are submitted to peer-reviewed, international journals (e.g. Urban Water, Water Science & Technology, Journal of Environmental Engineering). 3 publications are submitted to national technical journals (e.g. Stads- og Havneingenioeren, danskVAND, Spildevandsteknisk Tidsskrift).

An abstract was submitted but not accepted. Instead an abstract was submitted and accepted for the international conference 9th Highway and Urban Environment Symposium, Madrid, Spain, June 9 – 11, 2008

Reduction of toxic compounds by wet detention ponds

Tove Wium-Andersen, Asbjørn H. Nielsen, Thorkild Hvitved-Jacobsen and Jes Vollertsen

Aalborg University, Section of Environmental Engineering, Sohngaardsholmsvej 57, 9000 Aalborg, Denmark

Runoff from roads, highways and urban surfaces contains numerous organic and inorganic pollutants which can harm the aquatic environment. Some pollutants are toxic and some of the toxic pollutants accumulate in the aquatic fauna. It is therefore a primary objective of stormwater best management practices (BMPs) to reduce those compounds. A BMP that has become widely applied is the wet detention pond. Correctly designed, it removes a significant part of the particle-bound stormwater pollutants. However, when it comes to soluble pollutants and pollutants bound to colloids, wet detention ponds are less effective. As dissolved and colloidal pollutants are more mobile in the aquatic ecosystem, the effect of wet detention ponds on stormwater toxicity is consequently limited (Marsalek et al., 1999).

It is the objective of this study to investigate the reduction of problematic compounds and the associated toxicity by wet detention ponds. The experimental basis of the study is 3 wet detention ponds which are constructed in the frame of an EU LIFE Environment project named 'Treasure' (Vollertsen et al., 2007). The water quality with respect to organic and inorganic pollutants into and out of the ponds is monitored as is the corresponding change in stormwater toxicity. The relation between pollutant removal in the ponds and the reduction in toxicity is analyzed. It is furthermore by laboratory experiments tested whether the measured pollutants can account for the observed toxicity.

Marsalek J; Rochfort Q; Mayer T; Servos M; Dutka B; Brownlee B (1999). Toxicity testing for controlling urban wet-weather pollution: advantages and limitations. Urban Water, 1(1), 91-103

Vollertsen J; Åstebøl S O; Coward J E; Fageraas T; Madsen H I; Nielsen A H; Hvitved-Jacobsen T (2007). Monitoring and modeling the performance of a wet pond for treatment of highway runoff in cold climates. In: Highway and Urban Environment. Alliance for Global Sustainability Bookseries Science and Technology: Tools for Sustainable Development. G. M. Morrision and S Rauch (Editors). ISBN 978-1-4020-6009-0. Springer, The Netherlands, pp 499-509