

# Dynamic integrated water quality modelling: A case study of the Lambro River, northern Italy

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## **Abstract**

In this paper an integrated modelling approach is presented and applied to a 26km stretch of the Lambro River downstream of the Merone Wastewater Treatment Plant in northern Italy. The sub-models used (ASM1 for the treatment plant and RWQM1 for the river) have been implemented in the WEST® simulator. Hydraulics and quality processes of the Lambro River have been modelled with a ‘tanks in series’ approach. The purpose of this study is to model the effect on river water quality of an insufficient treatment capacity of the WWTP. The plant was constantly operating at its maximum hydraulic capacity, leading to a daily bypass of dry weather wastewater, which imposed a marked diurnal cycle on pollutant concentrations in the river. The assessment of the actual WWTP upgrade has confirmed its beneficial effect on the river water quality.

**Keywords:** ASM1, integrated modelling, LAS, model interfaces, RWQM1