

Assessing the environmental performance of urban wastewater systems using the INSA model:
Application to the Algés-Alcântara wastewater system, in Portugal.

Ferreira, F., Matos, J., Galvão, A., Cardoso, M.A.

Abstract

Although the application of complex integrated models to wastewater systems is useful, it is often difficult to implement and not always suitable for the design of new systems or for their rehabilitation. Integrated simple approaches that allow assessing the environmental performance of urban wastewater systems may be advantageous, especially during the initial phases of the system planning process.

This paper presents an original, straightforward approach that can be used for planning, design and operation of urban wastewater systems. The INtegrated SIMplified Approach (INSA) combines the concepts of performance indicators with mass balances and can be applied to wastewater systems as a management support tool, particularly in situations where there is lack of data, economic limitations or time constraints.

The INSA was applied to the Algés-Alcântara wastewater system to evaluate its environmental performance and to simulate the individual or combined impact of the rehabilitation measures proposed, thus defining their priority. The results clearly indicate that, despite the investment already made upgrading the wastewater treatment plant (WWTP), the proposed interventions must be implemented to ensure an acceptable environmental performance of the system. In addition, the results demonstrate the significant pollution loads present in stormwater, frequently higher than the pollution loads discharged into receiving waters during dry weather.