



Assessing clogging development in infiltration-percolation systems for wastewater treatment by electrical resistivity and induced polarisation methods

Josefina C. Tapias (1), Mahjoub Himi (2), Raúl Lovera (2), Angelica de la Rocha (1), Montserrat Foch (1), Humbert Salvadó (3), and Albert Casas (2)

(1) Soil Science Laboratory, Water Institute, Faculty of Farmacy, University of Barcelona, Barcelona, Spain (jtapias@ub.edu),
(2) Geochemistry, Petrology and Geological Prospecting Dept., Water Institute, Faculty of Geology, University of Barcelona, Barcelona, Spain (albert.casas@ub.edu), (3) Animal Biology Dept., Water Institute, Faculty of Biology, University of Barcelona, Barcelona, Spain (hsalvado@ub.edu)

Infiltration-percolation is a low technology process used to treat primary and secondary effluents. It consists in the intermittent application of sewage on buried sand filters where the infiltrated water percolates through unsaturated porous medium. The advantages over conventional mechanical sanitation systems are: low energy requirements, operation and maintenance that may be conducted by unskilled staff, and low sludge production because their simplicity and low operation costs.

Nevertheless, clogging is a major operational and maintenance issue associated with the use of infiltration-percolation systems for wastewater treatment, and can ultimately limit the lifetime of the system. The clogging development causes decrease of hydraulic conductivity, reduced oxygen supply and further leads to a rapid decrease of the treatment performance. For this reason it is essential to assess in advance the evolution of clogging process and detect potential failures in the system.

The preliminary results of this research conducted at the Hostalets de Pierola wastewater treatment plant (near Barcelona, Spain) show that electrical resistivity and induced polarisation geophysical methods can be very useful for delineating the clogging expansion. Then, this non-destructive methodology can help take the preventive measures for enlarge the lifetime of the treatment system.