



Infiltration tests at the Sant Vicenç dels Horts artificial recharge experimental site.

Marco Barahona-Palomo (1,2), Daniele Pedretti (1), and Xavier Sanchez-Vila (1)

(1) Department of Geotechnical Engineering and Geosciences, Technical University of Catalonia, Barcelona, Spain (marco.barahona@upc.edu, daniele.pedretti@upc.edu, xavier.sanchez-vila@upc.edu), (2) Department of Geosciences, Institute of Environmental Assessment and Water Research (IDAEA-CSIC), Barcelona, Spain

Infiltration capacity is the key parameter in an artificial recharge operation site. Infiltration capacity is spatially variable, and during operation it is also temporally variable due to surface clogging processes. Double-ring infiltrometer tests were performed at an experimental site close to Barcelona city (Spain). The site is located on alluvial deposits from the Llobregat River and comprises two half hectare ponds. River water collected upstream traveled through a two km pipe before entering the settling pond. Once the pond is filled water flows to the infiltration pond. Tests were performed only in the latter, prior to and after recharging the ponds. Prior to recharge, six points were selected to estimate infiltration capacity. Points were evenly distributed and chosen considering apparent soil texture at the site (coarse, medium and fine grains). All tests were performed allowing water to infiltrate for two hours and data was interpreted using the modified Kostiaikov equation.

Ponds were then flooded for about two months. The average infiltration rate values for the full infiltration pond before and after the flooding campaign were 5.8 m/day and 2.2 m/day, respectively. The double ring tests were then repeated at the same points, showing a reduction of the infiltration rate that varied between 7 and 90%. Control points with the initial highest infiltration rates presented the highest reduction in infiltration. Physical clogging due to particles settling appears to be the most likely cause of the diminished infiltration rates.

This result is confirmed by other independent measurements during the flooding test. There is a clear tendency towards a lower infiltration rates when observing the relation through time of flow entering per volume of water on the infiltration pond at a given time.