Data underlying the publication: "The contribution of deeper layers in slow sand filters to pathogens removal"

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General introduction

Column experiments were performed at the Water Lab in Faculty of Civil Engineering and Geosciences to determine the pathogen removal capacity of different depths of full-scale slow sand filters. The full-scale filter from Dunea drinking water treatment plant in the Netherlands was core sampled to obtain filter material from depths 0-5cm, 5-20 cm and 20-35 cm. The core sampled material from three depths was filled in three laboratory columns. Spiking experiments with enteric bacteria and virus surrogates- *E.coli* WR1 and PhiX 174 were performed in all three columns to obtain breakthrough curves which provided the input for the first-order retention and reentrainment model and to determine maximum log removal achieved for different depths. The experiment was performed under three conditions. Condition 1 was termed as bioactive condition where spiking was performed with an intact filter material as obtained from the full-scale filters. Condition 2 termed as bioinactive condition, the microorganisms in the filter material from condition 1 was suppressed by dosing sodium azide, leaving an inactive biofilm on the filter material. In the Condition 3, i.e., biofilm ignited condition, the biofilm on the filter material was removed from ignition, leaving behind a mixture of sand and ash. The sand mixture from 3 depths was washed through a 53-µm sieve and filled into their respective columns.

A detailed description of the data and experimental design has been provided in the data repository under the folder title “Data underlying the publication: The contribution of deeper layers in slow sand filters to pathogens removal”.

Data description

The excel file includes description of the design and dimensions of the column setup used in the experiments and the data provides concentrations of *E.coli* WR1 and PhiX 174 as a function of time during the spiking experiments from all three conditions.

Data file format

Database

The database file provided a tabulated overview of the test data. The database file consists of four tabs. The data content of each tab is described below.

Column description: This tab provides a details on the column design, dimensions, filter depths and characteristics of filter material used.

***E.coli* WR1- 3 conditions:** This tab provides data from the spiking experiments of *E.coli* WR1 in bioactive, bioinactive and biofilm ignited conditions.

PhiX 174-3 conditions: This tab provides data from the spiking experiments of PhiX 174 in bioactive, bioinactive and biofilm ignited conditions.

Deuterium: This tab provides a conservative tracer test data performed with Deuterium.

Overview of data columns

Column name	Unit	Explanation
Time	minutes	Time from start of experiment
Avg C_t	Colony forming units (CFU)/ml	Concentration of E.coli WR1 in the effluent of columns at time=t
Avg C_t	Plaques forming units (PFU)/ml	Concentration of PhiX 174 in the effluent of columns at time=t
Avg C_0	Colony forming units (CFU)/ml	Concentration of E.coli WR1 in the influent
Avg C_0	Plaques forming units (PFU)/ml	Concentration of PhiX 174 in the influent
Log removal	-	Measure of E.coli WR1 and PhiX 174 removed in the columns
C_t/C_0	-	Relative breakthrough concentration