

LABORATORY INVESTIGATIONS OF PILOT UPFLOW  
FILTER

by

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S Y N O P S I S

Upflow filters were in use as early as seventeenth to nineteenth centuries in England, France and the United States of America and have over the succeeding years found a lot of scope in its application in water and wastewater engineering. However, their use, especially in developing African countries, where water needs call for less sophisticated treatment processes for provision of potable water supply has been minimum. In Kenya, for example, one field upflow filter is presently in operation.

Experiments carried out in the Environmental Health Engineering Laboratory of the Department of Civil Engineering, University of Nairobi, with a pilot upflow filter showed that optimum conditions could be obtained which would provide highest efficiency of filtration which could be applicable to field operation conditions.

Preliminary tests of raw water and sand were carried out, Red Coffee Soil was used in creating artificial raw water because of its better uniform turbidity over black cotton soil and Fuller's earth. A concentration of 5 gm/l was found to be effective for laboratory test runs for the upflow filter.

The sand tests showed that a well graded sand passing through sieve size 2.38 mm and retained on 0.595 mm gave a very good sand medium for the upflow filter.

Twenty two test runs were carried out with the upflow filter using variable filtration rates for different sand bed depths and parameters of turbidity, colour and micro-organisms removal were determined. During the tests, the filter did not run dry and did not generate negative head. Furthermore, no mudballs were formed and filter rate controllers were not

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required. The optimum sand bed depth of 150 cm and a flow rate of 5 m/hr provided maximum average removal of turbidity (67%), colour (85%) and microorganisms (80%). pH values measured varied between 6.5 and 7.5 for raw and treated water during the test runs.