

T&O control by rapid sand filtration – a pilot-study

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Abstract:

One pilot-plant connected to a full-scale drinking water treatment plant in south east Queensland was utilized to determine the impact of nutrient-enhancement on the removal of the taste and odour (T&O) compounds 2-MIB and geosmin on a young and mature bio-film. Therefore, two different filter media were sampled from full-scale drinking water treatment plants. Sand filter media was taken from a plant performing pre-chlorination of the filters where a biofilm had to be established and filter-media which possessed a well-established biofilm (>10years). The pilot-filters were run for 5 months for acclimation at an EBCT of 6.5 minutes receiving the same filter feed.

Due to low levels of phosphate the filter feed water presented nutrient-deficient conditions for the biofilm. To probe for the impact of nutrient-enhanced conditions on T&O removal ortho-phosphate was dosed to the filter feed. The nutrient-enhanced conditions could especially augment T&O removal for the young biofilter. Furthermore the impact of PAC dosing in the raw water was investigated. While the young biofilm was sensitive to PAC dosing in terms of lower bioavailable carbon, the mature biofilm showed consistent high (<90%) 2-MIB and geosmin removal rates. The mature biofilter presented itself robust against filter shut downs for up to 4 days. A seeding trial was initiated by seeding pre-oxidised filter media with sand of a mature bio-filter probing for enhanced biofilter establishment.