

# FOOD CHAIN BIOACCUMULATION MODELLING FOR OCEAN OUTFALLS USING AQUAWEB

*Status: Completed*

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### BACKGROUND AND RELEVANCE

The possible occurrence and effects of bioaccumulation of trace organic compounds (TOCs) in food webs in the vicinity of ocean outfalls has long been associated with a high degree of uncertainty. In this study a food web model was developed to predict the extent of bioaccumulation of non-ionic hydrophobic organic chemicals through the aquatic food webs present at ocean outfalls. The version of AQUAWEB is based on a published model and provides estimates of chemical concentrations and associated bio-concentration factors (BCF), bioaccumulation factors (BAF) and biota-sediment accumulation factors (BSAF) of non-ionic hydrophobic organic chemicals that may be present in trace quantities in treated wastewater discharged at marine ocean outfalls.

The model allows the user to identify and prioritise chemicals for testing in wastewater (or recycled water) discharges. Biota (invertebrates, fish, seabirds, etc.) can also be prioritised for testing.

Working the models backwards from guidelines for parameters such as BAF, tolerance thresholds can be set for trace organic compounds in recycled water and when linked to CHEM-R, tolerance thresholds for raw sewage and trade waste discharges can also be set.

Separate versions of AQUAWEB were developed for the outfalls of Melbourne Water's Eastern and Western Treatment Plants. Similar models can be developed for discharges to lakes and rivers.

### RESEARCH APPROACH

Like CHEM-R, AQUAWEB is based on fugacity equations (see project 3032). Microsoft Excel® was used as the modelling platform for AQUAWEB for the same reasons as described for CHEM-R (project 3032).

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### AFFILIATIONS

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