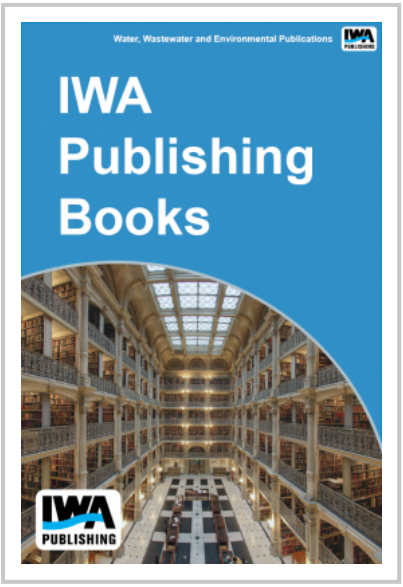
Advanced Water Treatment of Estuarine Water Supplies



Estuarine waters are an important source of drinking water for people living along the coasts. These waters tend to exhibit high concentrations of natural organic matter (NOM), bromide, salts, pathogens, and others, which create a challenge to drinking water suppliers that treat such waters. Thus, any utility using estuarine waters may need to consider advanced technologies and/or disinfectants (e.g., membrane filtration, MIEX® resin, chlorine dioxide, UV disinfection) to meet current or future drinking water regulations.

The objectives of the study were to (1) determine disinfectant combination(s) that optimize microorganism inactivation and limit disinfection by-products (DBP) formation; (2) investigate technologies (coagulation, granular activated carbon (GAC), MIEX® resin, and membranes) in conjunction with disinfectants with regard to their applicability to treat estuarine waters; (3) investigate the impact of multiple disinfectants on distribution system water quality; (4) evaluate the operational issues associated with ultraviolet (UV) disinfection, and (5) provide a comparative cost analysis for the proposed solutions.

The project included several desktop studies including a literature review, a review of the current and future regulations, and analyses of raw and treated water quality data available from the participating utilities. Pilot- and bench-scale testing were conducted to evaluate different disinfectant combinations (involving chlorine, monochloramine, chlorine dioxide, ozone, UV disinfection, and potassium permanganate) and treatment strategies on DBP formation and treated water quality. The study examined the effect of MIEX® resin, as well as MIEX® in combination with coagulation or membranes, on NOM and bromide removal. Demonstration-scale UV reactors (medium pressure [MP] and low pressure high output [LPHO]) were studied to provide data on implementation issues, particularly, power quality, UVT variability, sleeve fouling, and sensor reliability. Conceptual level cost estimates were also developed as part of all the tasks.

This book is out of print. If you need information about this, please contact publications@iwap.co.uk [1].

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