Basic Water Treatment

Basic Water Treatment

Sixth edition

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Foreword to the sixth edition

The sixth edition of *Basic Water Treatment* is a timely update to this trusted, internationally renowned, and well-used source of information for all professions involved in the design, construction, and operation of water treatment facilities.

The authors provide a comprehensive review of the principles of the approach to be drawn upon when developing and appraising effective and efficient design options for new or enhanced treatment processes, together with sound advice on current good treatment practices.

For this edition, the updates to the sections on activated carbon and membrane processes, in particular, will be welcomed by many readers. The authors also provide a useful reminder of the fundamental concepts of risk management as these apply to the supply of clean safe drinking water, by setting out how incorporating a water safety plan approach underpins the design and operation of water treatment facilities. This nudge for the reader to be aware of the wider context for the setting of expectations of the role of treatment in modern integrated source-to-tap management of water supplies nicely complements the reader's need to have access to detailed explanations of process options.

The proactive, preventative features of good water treatment practice also put emphasis on another aspect of risk management that is critical to maintaining the trust and confidence of consumers in their water supply, that is, resilience of the supply. For treatment facilities to be fit for purpose today, they need not only to produce water of the required standards consistently and sustainably, but to be designed and operated with the capacity to contain and recover interruptions to treatment, while minimising the consequences for consumers. Again, an understanding and awareness of how developing or using water treatment facilities relates to the wider service requirements of the water supplier and the community it serves is entirely pertinent to our professional roles today.

Basic Water Treatment provides essential knowledge that is of value to both students and practitioners, and I am pleased to commend this sixth edition as a reliable guide for all concerned with understanding the fundamentals of water treatment.

Milo Purcell
*Deputy Chief Inspector of Drinking Water for
England and Wales*

Preface

The sixth edition of this book, which has become one of the accepted primers on water treatment, is a significant update of the fifth edition, reflecting recent changes in water treatment and changing priorities. A new chapter has been added to expand coverage of GAC adsorption. The coverage of membrane processes has been expanded and a section added on advanced oxidation processes. However, this remains a relatively slim volume covering water treatment – a very broad subject – and thus a degree of subjectivity has had to be exercised over what should be covered.

Basic Water Treatment is aimed at university students, at practising water treatment engineers, for whom it will be a useful reference book, and at mechanical engineers and chemists who need to put their specialised knowledge into a broader context. It will also be of interest to those managers and non-technical staff who wish to understand some of the quality and technical issues relating to water treatment. It is not a prescriptive handbook on water treatment plant design; rather, it provides essential background and is a useful first-choice reference book for many aspects of water quality and treatment.

It is important that all involved in water quality and water treatment do not adopt too blinkered an approach. In Western Europe, we now have to focus very closely on compliance with prescriptive water quality standards, although the Water Framework Directive and public concerns over the environment require a wider consideration of water resources and water demands. Indeed, over much of the world, water engineers should consider, or at least be aware of, much wider issues, weighing the costs of high-quality water against the overriding need to supply safe water to as many as possible.

Basic Water Treatment primarily relates to water treatment in Western Europe and North America but it also takes account of treatment in other developed areas as well as in developing and less developed areas.

About the authors

Chris Binnie MA DIC HonDEng FREng FICE FCIWEM has worked and lectured extensively in many countries.

A past president of the Chartered Institution of Water and Environmental Management and a Fellow of the Royal Academy of Engineering and of the Institution of Civil Engineers, he is now a Visiting Professor at the University of Exeter's Centre for Water Systems.

Martin Kimber CEng MICE is a water treatment specialist with over 30 years' experience of working on all aspects of water quality and treatment, most recently with Atkins Water. Prior to joining Atkins, where he gained many years of experience both in the UK and overseas, he worked for companies in the USA and in Kenya. His experience encompasses the full range of water treatment plants from simple developing world slow sand processes to modern advanced water treatment.

Hugh Thomas CWEM CSci FCIWEM AMIChemE is a Chief Process Engineer with 20 years' experience in the water and wastewater treatment industry. He is currently Technical Authority for Process Engineering within Atkins Water, with national responsibility for leading technical excellence, innovation, and quality. During his career, he has held positions in client, consultant, and contractor organisations. He is on the committee of the IChemE Water Special Interest Group and the Industry Advisory Panel at Cranfield University.