Advances in Taste and Odor Treatment and Control [Project #629]

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BACKGROUND
Consumers today want drinking water that looks good and tastes good. These perceptions of water quality are translated to mean the overall healthfulness of the water. This is a significant correlation for water utilities to appreciate. Taste-and-odor episodes are fairly widespread among a range of water providers. Strategies for control of taste-and-odor events have advanced in the last decade due to the efforts of the authors of this report. Key to the advancement of the science of taste-and-odor control in drinking water is the ability to identify and analyze the chemical compounds responsible for the off flavors in water. The science will continue to advance as more effort is made to characterize the taste-and-odor types and to develop analytical procedures to identify the compounds.

APPROACH
The Awwa Research Foundation and Lyonnaise des Eaux, two leading water research groups in the world, have collaborated with a network of volunteer authors to bring the drinking water community Advances in Taste-and-Odor Treatment and Control. The effort builds on the earlier cooperative report, Identification and Treatment of Tastes and Odors in Drinking Water, which has been a consistent bestseller. This book focuses on a variety of unit processes used by water utilities both in North America and Europe and looks at their impact on tastes and odors. The collaboration of authors from both sides of the Atlantic provides the reader with an international perspective of the range of treatment alternatives.

CONTENTS
This book includes the updated taste-and-odor wheel, which consistently defines for the first time eight odor types, four tastes, and feeling factors. The development of the taste-and-odor wheel should help water utilities define their particular chronic and episodic taste-and-odor problems. The wheel will also help the water industry communicate internally and with consumers about their taste-and-odor problems. A clear evaluation of the types of taste-and-odor problems at a utility is the first step to treatment and control. (Note: A bilingual poster of the taste and odor wheel is included.)

The unit processes included in the book start with resource control, that is, the necessary monitoring and treatments that could be used in lakes, reservoirs, rivers, and groundwater to alleviate the problem at the source. Once the water enters the treatment plant, there are a range of unit processes used that can impact sensory components of the water. The oxidation processes of chlorination, chloramination, chlorine dioxide, ozone, and potassium permanganate are discussed from the perspective of the various types of taste-and-odor problems reported and documented with the use of each. There is a chapter of the book on activated carbons, which are often used by utilities for taste-and-odor control. Biological treatment is a unit process used primarily in Europe with increasing interest in North America, and the authors of this chapter present some of the basics of biological treatment and the biodegradability of taste-and-odor compounds.

Taste as a sensory perception is also considered and possible control measures are discussed. The impact of distribution system materials and operations on tastes and odors, along with suggested solutions, is another
chapter topic. The monitoring and analysis chapter discusses the advances in both qualitative and quantitative chemical and sensory analysis that are used to assess the taste and odor of both raw and treated drinking water. The final chapter deals with the sequences of treatment processes that are used to combat chronic taste-and-odor problems. The chapter synthesizes some of the information from previous chapters related to individual processes to provide a "big-picture" perspective.