Air Quality

This text is recommended as a general introduction to a wide range of air quality issues for undergraduate courses such as environmental studies or meteorology. The author succeeds in presenting descriptive information on air pollutant chemistry, meteorology, health effects, vegetation effects, noise pollution, indoor air pollution, regulatory issues, and other areas in an interesting manner with tables and figures. However, the text includes virtually none of the mathematical equations necessary for an understanding of the physical basis for many air quality phenomena, limiting its use for more advanced students. The quality of the information varies considerably with different topics, e.g. the references for indoor air pollution are relatively recent while those for welfare effects are somewhat outdated. There are relatively minor technical mistakes as expected in such a broad ranging text, such as the indications that the $O_2 + NO \rightarrow NO_2 + O_2$ reaction in the atmosphere is reversible. Similarly, several figures inadvertently switch indicators of adiabatic and environmental lapse rates, some air quality instrumentation described is outdated, and the criteria listed for different stages of pollutant episodes are no longer accurate. In summary, this book is recommended for its presentation of sometimes difficult subjects in a descriptive manner, and should be supplemented by more recent reference material for an understanding of current complex issues in air quality.—DAVID M. OLSZYK, Statewide Air Pollution Research Center, University of California, Riverside, CA 92521.

Irrigation with Reclaimed Municipal Wastewater—A Guidance Manual
Edited by G. Stuart Pettygrove and Takashi Asano, Lewis Publishers, Inc., 1215 S. Main Street, P.O. Drawer 519, Chelsea, MI 48118.

This book is a collection of chapters by 27 authors on the planning, design, and operation of irrigation systems utilizing municipal wastewater. The emphasis of this book is on optimum utilization of municipal wastewater as a resource rather than on disposal of wastewater. The discussions deal strictly with irrigation systems for crop production and do not touch on other land treatment methods such as overland flow and groundwater recharge.

The topics covered include an overview of municipal wastewater characteristics and suitability for irrigation, health and environmental aspects, site evaluations and selection, crop selection and management, irrigation system design and management, economics of wastewater irrigation, and legal aspects and potential effects on groundwater quality. Although some of the chapters are written specifically for California conditions, most of the information is applicable to other arid and semiarid states. All of the topics are treated comprehensively and references are given where more engineering details would be required for implementing irrigation systems.

This book will be of interest to anyone in the waste disposal field but will be particularly useful to those planning or managing irrigation systems for utilization of municipal wastewater.—CLARENCE LANCE, Water Quality and Watershed Research Laboratory, P.O. Box 1430, Durant, OK 74702.

Ground Water Quality

This book is based on the scientific issues raised at the First International Conference on Ground Water Quality Research held at Rice University in Houston, TX, 7 to 10 Oct. 1981. This conference sponsored by the National Center for Ground Water Research stressed the chemical and biological aspects of ground water resources, and was intended to mainly focus attention on the scientific and technological challenges and accomplishments in ground water quality research.

The Conference was organized into four symposia dealing with: (i) Sources, types, and quantities of contaminants in ground water; (ii) Methods for ground water quality research; (iii) Subsurface characterization in relation to ground water pollution; and (iv) transport and fate of subsurface contaminants. The same structure is reflected in this book.

The volume contains a collection of 28 papers written by 60 internationally recognized experts (48 USA, 4 The Netherlands, 2 U.K., 2 New Zealand, 2 Federal Republic of Germany, 2 Switzerland). But these statistics also somewhat reflect the restricted international representation of this First International Conference. It is also a pity that the publication of this book has been delayed so long. The 4 years between the conference and the publication renders the edition somewhat out of date due to the rapid development of the topic.

However, each paper in the collection is authoritative, thorough in its treatment and sufficiently broad in its appeal to be a valuable resource to scientists, hydrologists, hydrogeologists, and engineers working in such applied fields as drinking water supply and ground water pollution control.

Traditional ground water quality research has been primarily directed toward the transport and transformation of inorganic solutes (metals, nitrogen, and phosphorus). The broader scope of this book includes research that especially addresses chemical and biological processes affecting ground water quality, such as:

- the role of subsurface microbes in the degradation of surface organic contaminants;
- the basis for interactions between organic materials and minerals in the subsurface;
- the movement and presence of viruses in ground water; and
- the use of modeling methods to predict the movement of ground water contaminants.

The wide-ranging content of this book in its subject matter and in the geographical areas covered, offers a worthwhile overview on the state of ground water quality issues at the beginning of the 1980's. As indicated also by the editors, this book will prove equally valuable whether it be for research purposes or pollution control. It is, however, apparent that the wide-ranging list of topics also causes a lack of depth and shows some redundancy. The book can not substitute for a well-structured teaching text on ground water quality.

Nevertheless, each of the chapters shows the limited nature of our present-day knowledge on the biochemical processes in the subsurface environment, particularly in terms of mathematical descriptions that only provide the basis for forecast and control. Along these lines, a major research effort has yet to be accomplished.—L. LUCKNER, Professor of Soil and Ground Water Science, Dresden University of Technology, at time, Department of Land, Air and Water Resources, University of California, Davis, CA.