PREFACE

In 1971, at the request of the United States Environmental Protection Agency, the National Academy of Sciences - National Academy of Engineering undertook the revision of WATER QUALITY CRITERIA, the 1968 Report of the National Technical Advisory Committee (NTAC) to the Secretary of the Interior. The Academies appointed a Committee on Water Quality Criteria and six Panels, and the responsibility for overseeing their activities was assigned to the Environmental Studies Board, a joint body of the Academies.

The guidelines for the Academies' Committee were similar to those followed by the NTAC. The Federal Water Pollution Control Act of 1948, as amended by the Water Quality Act of 1965, authorizes the States and the Federal Government to establish water quality standards for interstate and coastal waters. Paragraph 3, Section 10 of the 1965 Act reads as follows:

> Standards of quality established pursuant to this subsection shall be such as to protect the public health or welfare, enhance the quality of water and serve the purposes of this Act. In establishing such standards the Secretary, the Hearing Board, or the appropriate state authority shall take into consideration their use and value for public water supplies, propagation of fish and wildlife, recreational purposes, and agricultural, industrial, and other legitimate uses.

Because of the vast amount of material that falls into the rubric of fish and wildlife, the Academies established separate Panels for freshwater and marine aquatic life and wildlife. Thus the Committee's six Panels were: (1) Recreation and Aesthetics, (2) Public Water

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Supplies, (3) Freshwater Aquatic Life and Wildlife, (4) Marine Aquatic Life and Wildlife, (5) Agricultural Uses of Water, and (6) Industrial Water Supplies.

The members of the Committee and its Panels were scientists and engineers expert and experienced in the various disciplines associated with the subject of water quality. The Panels also drew upon special advisors for specific water quality concerns, and in addition were aided by Environmental Protection Agency experts as liaison at the Panel meetings. This arrangement with EPA facilitated the Panels' access to EPA data on water quality. Thirty-nine meetings were held by the Committee and its Panels resulting in an interim report to the Academies and the Environmental Studies Board on December 1, 1971. This was widely circulated, and comments on it were solicited from many quarters. The commentaries were then considered for inclusion by the Committee and the appropriate Panels. This volume, submitted for publication in August 1972, within eighteen months of the inception of the task, is the final version of the Committee's report.

The 1972 Report is vastly more than a revision of the NTAC Report. To begin with, it is nearly four times longer. Many new subjects are discussed in detail, among them: the recreational impact of boating, levels of use, disease vectors, nuisance organisms, and aquatic vascular plants; viruses in relation to public water supplies; effects of total dissolved gases on aquatic life; guide-

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lines for toxicological research on pesticides and uses of toxicants in fisheries management; disposal of solid wastes in the ocean; use of waste water for irrigation; and industrial water treatment processes and resultant wastes. Many toxic or potentially toxic substances not considered by the NTAC are discussed including polychlorinated biphenyls, phthalate esters, nitrilotriacetate (NTA), numerous metals, and chlorine. The additional length also reflects the greater current awareness of how various characteristics of water affect its quality and use; and the expansion of the information base of the NTAC Report through new data from recent research activities and the greater capabilities of information processing, storage, and retrieval -- especially evident in the three appendixes -- have made their impact on the increase in size. In spite of these additions, however, the 1972 Report differs from the NTAC Report in that its six Sections do not provide summaries. The Committee agreed that an understanding of how the recommendations should be interpreted and used can be gained only by a thorough reading of the rationale and the evaluation of criteria preceding the recommendations.

Although each Section was prepared by its appropriate Panel, some discussions reflect the joint effort of two or more Panels. These combined discussions attempt to focus alternative perspective where desirable on such subjects as temperature, nutrient enrichment, and growths of nuisance organisms. However, the majority of topics were most effectively treated by individual Panel discussions, and the

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reader is encouraged to make use of the Table of Contents and the index in assessing the full range of the Report's coverage of the many complex aspects of water quality.

Water quality science and its application have expanded rapidly, but much work remains to be done. In the course of this revision, the Committee and its Panels have identified many areas where further knowledge is needed, and these findings, now in preparation, will be published separately by the National Academy of Sciences - National Academy of Engineering as a report on research needs.

Social perspectives and policies for managing, enhancing, and preserving water resources are undergoing rapid and pervasive change. Because of the stipulations of the 1965 Water Quality Act, interstate water resources are currently categorized by use designation, and standards to protect those uses are developed from criteria. It is in this context that the Report of the NAS-NAE Committee, like that of the NTAC, was prepared. Concepts of managing water resources are subject to social, economic, and political decisions and will continue to evolve; but the Committee believes that the criteria and recommendations in this Report will be of value in the context of future as well as current approaches that might be taken to preserve and enhance the quality of the nation's water resources.

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