

INTERNATIONAL STANDARDS FOR DRINKING-WATER

Second Edition



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P R E F A C E

The International Standards for Drinking Water published by WHO in 1958 received immediate and wide recognition as essential aids to the improvement of water quality and treatment. These Standards are cited in the International Sanitary Regulations as applicable in deciding what constitutes a pure and acceptable water-supply at airports and other ports.

The replies to a recent questionnaire sent to the Member States indicate that the 1958 Standards have been widely used as a reference in the development of local standards and as a basis for improved water treatment practices. Five nations have adopted the International Standards as official and legal standards of water quality. Several others have developed national standards based in part or in whole on the International Standards.

The replies also suggested that the 1958 Standards might well be reviewed and revised to bring them into line with present needs and with current water treatment practices. WHO therefore convened an Expert Committee composed of technical experts from all six WHO regions to review the 1958 Standards and to recommend pertinent changes and additions. This Committee met in Geneva in August 1962 and the present revised edition of International Standards for Drinking Water is the outcome of its recommendations. Essential changes have been made in the 1958 Standards and a new section has been added on standards of quality for water sources to be used for water-supplies.

As in the previous edition, a major part of the present work consists of annexes devoted to approved methods for the examination of water. Each of these has been revised to ensure that widely studied and published procedures are recommended for the evaluation of water quality.

The Expert Committee emphasized that neither the standards themselves nor the laboratory methods should be considered as static or final; they should be under continual study and should be modified whenever necessary to conform to the most recent advances in water technology. The Committee indicated various areas in which needed research might be undertaken without delay, and urged that the data obtained be made the basis of essential technical developments in water treatment and water analysis.

In the preparation of the material for this publication, use was made of many sources, chiefly The bacteriological examination of water-supplies

of the Ministry of Health and the Ministry of Housing and Local Government for England and Wales, the 11th edition of Standard methods for the examination of water and wastewater of the American Public Health Association, the 3rd edition of Approved methods for the physical and chemical examination of water of the Institution of Water Engineers, and European standards for drinking water, published by WHO.

The approved methods for the examination of water given in Annexes 3, 4, 5 and 6 of this volume were originally drawn up by various national bodies and have been published in standard works of reference or in scientific journals. In approving these methods for inclusion in International Standards for Drinking-Water, the WHO Expert Committee on International Standards for Drinking-Water found it necessary to make a small number of minor amendments, and it therefore accepts full responsibility for the amended texts.

In publishing this revised edition of International Standards for Drinking-Water, WHO hopes to stimulate further investigations of the problem of providing safe and potable water to all people and immediate consideration of the function of criteria of water quality in the control and improvement of water treatment. WHO would welcome constructive criticism based on experience in the application of these recommendations. This will enable their value to be assessed and necessary improvements made in any future edition.

The membership of the Expert Committee that developed the standards given on the following pages is listed in Annex 8.

1. GENERAL REQUIREMENTS

That water intended for human consumption must be free from chemical substances and micro-organisms in amounts which would provide a hazard to health is universally accepted. Supplies of drinking-water should not only be safe and free from dangers to health, but should also be as aesthetically attractive as possible. Absence of turbidity, colour and disagreeable or detectable tastes and odours is important in water-supplies intended for domestic use. The location, construction, operation and supervision of a water-supply—its sources, reservoirs, treatment and distribution—must exclude all potential sources of pollution and contamination.

Some countries in the world have established standards of quality which are applicable to their respective areas and have developed a certain degree of uniformity in methods of analysis and in the expression of the results of such analyses. Other countries, however, lack official or recognized standards of water quality and have no accredited procedures for the examination of water to assess its quality and safety. During regional and international conferences sponsored by the World Health Organization, the problems of standards of quality for a safe and acceptable water-supply, and of accredited or approved methods for the examination of water, have been fully discussed by groups of expert hygienists and engineers concerned with matters of water sanitation. Great improvement in water quality can be achieved throughout the world if various treatment processes are made easily comparable by the adoption of uniform methods for the examination of water and for the expression of results of such examinations. Further, outbreaks of water-borne disease could be avoided through stricter control by the responsible water-supply and health authorities of the quality of water distributed for drinking purposes. The World Health Organization has therefore conducted a study of these problems, in collaboration with Member States and with the assistance of a number of experts, in an effort to offer technical guidance to health and sanitation administrations wishing to revise their regulations on water-quality control.

1.1 Purpose

This publication will be of assistance to operators of water-supplies and others concerned with the treatment and distribution of water. It is intended to apply to water as it is supplied to the public and to the selection and treatment of water for use as public supplies. It is hoped that

it will be of particular value to health authorities in ensuring that the supplies of water which reach the public are safe and potable.

1.2 Scope

This publication is concerned with the minimum standards of chemical and bacteriological quality of public supplies of water for domestic use. Although it is desirable that the quality of water for individual and small supplies should not be inferior to that supplied to the public in large communities, it is not considered that all small supplies could reasonably be expected to conform to the standards suggested for larger communities. However, the standards recommended here are applicable to all communal supplies serving a group of the population and for which control of treatment and distribution is essential for safe and sanitary quality. The basic importance of the quality of water to be selected as a source of drinking-water supply is recognized, and a special discussion of this problem is included as a part of this volume.

Conditions differ widely throughout the world. Some countries are fortunate in having an abundant supply of water from deep wells and underground springs, while others must make extensive use of rivers, lakes and other sources of surface water. It is felt, however, that the recommendations which follow should be applicable whatever the original source of the water or its treatment may be.

It is not envisaged that the standards of physical, chemical and bacteriological quality or the various laboratory methods recommended here will be the final word on the subject. New methods are constantly being proposed and developed, and it is anticipated that the methods suggested and the standards of quality will be revised from time to time. There are certain matters, such as the problems of pollution from radioactive material and from chemical products used in industry and agriculture (hydrocarbons, detergents, pesticides) and the possibility of the presence of pathogenic viruses in water, on the importance of which there is as yet insufficient knowledge. It is possible also that, in the control of

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