International Standard

ISO 24521

Drinking water, wastewater and stormwater systems and services — Management of on-site domestic wastewater services

Systèmes et services relatifs à l'eau potable, à l'assainissement et à la gestion des eaux pluviales — Gestion sur site des services d'eaux usées domestiques

Second edition
2025-05

Reference number
ISO 24521:2025(en)

ISO copyright office
CP 401 • Ch. de Blandonnet 8
CH-1214 Vernier, Geneva
Phone: +41 22 749 01 11
Email: copyright@iso.org
Website: www.iso.org

Published in Switzerland

Contents

Page

Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO document should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

ISO draws attention to the possibility that the implementation of this document may involve the use of (a) patent(s). ISO takes no position concerning the evidence, validity or applicability of any claimed patent rights in respect thereof. As of the date of publication of this document, ISO had not received notice of (a) patent(s) which may be required to implement this document. However, implementers are cautioned that this may not represent the latest information, which may be obtained from the patent database available at www.iso.org/patents. ISO shall not be held responsible for identifying any or all such patent rights.

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT), see www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 224, *Drinking water, wastewater and stormwater systems and services*.

This second edition cancels and replaces the first edition (ISO 24521:2016), which has been technically revised.

The main changes are as follows:

— the title has been changed to be in line with the title of ISO/TC 224 and with the title of ISO 24525:2022;

— the term "basic" has been deleted from the title and from the normative text because this document also contains guidance and requirements for systems that are not basic;

— the names and content of the clauses have been harmonized with those in ISO 24525:2022;

— Annex A in ISO 24521:2016 has been deleted;

— Annex B from the previous edition has been replaced by the new Annex A which contains examples for both basic and more advanced systems.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

Introduction

0.1 Water issues: global context and policies framework

Water constitutes a worldwide challenge for the 21st century, both in terms of the management of available water resources and the provision of access to drinking water and sanitation for the world's population. In 2000, the United Nations recognized that access to water is an essential human right and, in conjunction with national governments, it set ambitious goals (the "Millennium Development Goals" MDGs) to increase access to drinking water and wastewater services, including safe disposal or reuse of treated residues (jointly referred to as "water services" in this document), particularly in developing countries.

The COVID-19 pandemic has demonstrated the critical importance of sanitation, hygiene and adequate access to clean water for preventing and containing diseases. According to the World Health Organization, handwashing is one of the most effective actions to reduce the spread of pathogens and prevent infections. Yet billions of people still lack access to safe water and sanitation, and funding is inadequate.

Reflecting an increasing international recognition of the importance of water services, in 2010 the United Nations General Assembly declared safe and clean water and sanitation as well to be a single human right. In 2015, following extensive technical discussions, new international goals (the "Sustainable Development Goals", SDGs) were set by the United Nations Assembly. The sixth SDG aims to "ensure availability and sustainable management of water and sanitation for all".

In particular, its target 6.2 intends to "achieve by 2030 access to adequate and equitable sanitation and hygiene for all" and to "end open defecation, paying special attention to the needs of women and girls and those in vulnerable situations". The WHO/UNICEF Joint Monitoring Programme for Water, Supply, Sanitation and Hygiene (JMP), responsible for monitoring SDG target 6.2, concluded in its most recent progress report (Reference [6]) that, at current rates of progress, the world will only reach 65 % coverage by 2030, leaving 3 billion people without safely managed sanitation services. As such, achieving universal coverage of sanitation services by 2030 will require a fivefold increase of current rates of progress.

Another relevant remark related to SDGs is that target 6.2, contrary to precedent MDGs, goes beyond the types of sanitation facilities people use and introduces additional criteria related to the level of service provided.

UN agencies (including WHO, UNICEF and UNESCO) and sectoral institutions have been developing recommendations and programmes to establish a framework in which to advance in alignment with international targets.

For instance, the United Nations Commission on Sustainable Development has emphasised that governments have a primary role in promoting improved access to safe drinking water and basic sanitation through improved governance at all levels and appropriate enabling environments and regulatory frameworks, with the active involvement of all stakeholders. If public and private solutions are incorporated into this process, the water sector becomes more productive, and the management of water resources becomes more sustainable.

NOTE Governments are referred to as "relevant authorities" in ISO 24510, ISO 24511 and ISO 24512.

Examples of key issues for efficient drinking water and sanitation services policy frameworks are:

— clearly defining the roles of the different stakeholders;

— establishing how sanitary rules and organization are defined and assessed;

— establishing processes to ensure consistency between the policies regarding urban development and water utility infrastructure;

— regulating water withdrawal and treated wastewater and sludge discharge and reuse;

— providing information to users and communities;

— regularly reviewing relevant standards concerning emerging issues.

0.2 Water utilities: general objectives

In addition to public health protection, sound management of the drinking water and wastewater utilities (jointly referred to as "water utilities" in this document) is an essential element of integrated water resources management. When applied to these utilities, sound management practices will contribute, both quantitatively and qualitatively, to sustainable development. Sound utility management also contributes to social cohesion and economic development of the communities served, because the quality and efficiency of water services have implications for virtually all activities of society.

As water is considered to be a social good and activities related to water services support the three aspects (economic, social, and environmental) of sustainable development, it is logical that the management of water utilities be transparent to, and inclusive of, all stakeholders identified in accordance with the local context.

There is a broad array of stakeholders that can play a role in activities related to water services. Examples of such stakeholders include:

— governments or public agencies (international, national, regional, or local);

— associations of the utilities themselves (e.g. international, regional/multinational, and national drinking water or wastewater associations);

— autonomous bodies seeking to play an overview role (e.g. organizations concerned, such as non-governmental organizations);

— users and associations of water users.

The relationships between stakeholders and water utilities vary around the world. In many countries, there are bodies that have responsibility (in whole or in part) for overseeing the activities related to water services, whether the utilities are publicly or privately owned or operated, and whether they are regulated by relevant authorities or acting in a system of technical self-regulation. Standardization and technical self-regulation are possible ways of ensuring involvement of all stakeholders and meeting the subsidiarity principle.

The aim of water utilities is to offer services to everybody in the area of responsibility of the utility, to provide users with a continuous supply of drinking water and to collect and treat wastewater under economic and social conditions that are acceptable to the users and to the utility. Water utilities are expected to meet the requirements of relevant authorities and the expectations specified by the responsible bodies in conjunction with the other stakeholders, while ensuring the long-term sustainability of the service. In a context of scarcity of resources, including financial resources, it is advisable that the investments made in installations be appropriate and that necessary attention be paid to proper maintenance and effective use of the installations. It is advisable that water tariffs generally aim at meeting cost-recovery principles and at promoting efficiency in the use of the resources, while striving to maintain affordable basic access to water services.

It is advisable that the stakeholders be involved in both setting service objectives and assessing the adequacy and efficiency of service.

0.3 Objectives, content and implementation of ISO standards addressing water services

The ISO standards addressing water services are ISO 24510 (service-oriented), ISO 24511 and ISO 24512 (both management-oriented). The objective of these ISO standards is to provide the relevant stakeholders with guidelines for assessing and improving the service to users and guidance for managing water utilities, consistent with the overarching goals set by the relevant authorities.

ISO 24525 supplements and is intended to be used in conjunction with this document and with ISO 24511. While ISO 24525 brings guidance and specifications for the operation and maintenance (O&M) of on-site domestic wastewater systems and services, using appropriate technologies at any level of development, this document provides guidance for the management of on-site domestic wastewater systems and services, using appropriate technologies in their entirety at any level of development.

0.4 Deficits in sanitation services