
**Guidelines for treated wastewater use
for irrigation projects —**

**Part 3:
Components of a reuse project for
irrigation**

*Lignes directrices pour l'utilisation des eaux usées traitées en
irrigation —*

Partie 3: Éléments d'un projet de réutilisation en irrigation

Document Preview

ISO 16075-3:2021

<https://standards.iteh.ai/catalog/standards/iso/375f003d-217c-4364-8e93-9b211fd41996/iso-16075-3-2021>



iTeh Standards
(<https://standards.iteh.ai>)
Document Preview

[ISO 16075-3:2021](https://standards.iteh.ai/catalog/standards/iso/375f003d-217c-4364-8e93-9b211fd41996/iso-16075-3-2021)

<https://standards.iteh.ai/catalog/standards/iso/375f003d-217c-4364-8e93-9b211fd41996/iso-16075-3-2021>



COPYRIGHT PROTECTED DOCUMENT

© ISO 2021

All rights reserved. Unless otherwise specified, or required in the context of its implementation, no part of this publication may be reproduced or utilized otherwise in any form or by any means, electronic or mechanical, including photocopying, or posting on the internet or an intranet, without prior written permission. Permission can be requested from either ISO at the address below or ISO's member body in the country of the requester.

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	v
Introduction	vi
1 Scope	1
2 Normative references	1
3 Terms, definitions and abbreviated terms	1
3.1 Terms and definitions.....	1
3.2 Abbreviated terms.....	2
4 Storage reservoir	2
4.1 General.....	2
4.2 Reservoir types.....	2
4.3 Storage time.....	3
4.4 Problems and strategies.....	3
5 Additional treatment facilities	5
5.1 General.....	5
5.2 Filtration.....	5
5.3 Additional disinfection.....	6
6 Distribution systems	6
6.1 Pumping stations.....	6
6.2 Pipelines.....	6
6.3 Accessories.....	7
6.3.1 General.....	7
6.3.2 Valves.....	7
6.3.3 Blowoffs.....	8
6.3.4 Flowmeters.....	8
6.3.5 Hydrants.....	8
6.4 Resistance of irrigation devices to pH and fertilizers.....	8
6.5 Maintenance of distribution networks to prevent bacterial regrowth.....	9
6.6 Design and operation of distribution network to protect drinking water sources.....	9
6.6.1 General.....	9
6.6.2 Stipulating a protective radius.....	10
6.6.3 Principles of TWW irrigation above (underground or surface) drinking water pipelines.....	10
6.6.4 Principles of cross-connection.....	10
6.6.5 Principles of painting and marking TWW irrigation pipelines and systems.....	11
7 Irrigation systems	12
7.1 Classification.....	12
7.2 Pressurized irrigation systems.....	13
7.2.1 Sprinkler systems.....	13
7.2.2 Micro-irrigation systems.....	14
7.2.3 Filtration.....	15
7.2.4 Automation of the irrigation.....	15
7.3 Preventive treatments, regular maintenance, and handling pressurized irrigation system failures subject to TWW quality.....	15
7.3.1 General.....	15
7.3.2 Water quality parameters required for the treatment and maintenance of irrigation systems, for micro-sprinklers and drip irrigation systems.....	15
7.3.3 Equipment and treatments for micro-sprinklers and drip irrigation systems.....	16
7.3.4 Restoring working order of an irrigation system after failure.....	19
Annex A (informative) Guidelines for injecting chlorine into drip irrigation systems	20
Annex B (informative) Guidelines for acid use in drip irrigation systems	22

Annex C (informative) Guidelines for injecting hydrogen peroxide into drip irrigation systems	25
Annex D (informative) Guidelines for sampling drip irrigation pipes	30
Annex E (informative) Appropriated chemicals	32
Annex F (informative) Flushing the drip irrigation pipes	34
Bibliography	37

iTeh Standards
(<https://standards.itih.ai>)
Document Preview

[ISO 16075-3:2021](https://standards.itih.ai/catalog/standards/iso/375f003d-217c-4364-8e93-9b211fd41996/iso-16075-3-2021)

<https://standards.itih.ai/catalog/standards/iso/375f003d-217c-4364-8e93-9b211fd41996/iso-16075-3-2021>

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 documents 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).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

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 282, *Water reuse*, Subcommittee SC 1, *Treated wastewater reuse for irrigation*.

This second edition cancels and replaces the first edition (ISO 16075-3:2015), which has been technically revised.

The main changes compared to the previous edition are as follows:

- editorial changes;
- addition of [Annex F](#).

A list of all parts in the ISO 16075 series can be found on the ISO website.

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

The increasing water scarcity and water pollution control efforts in many countries have made treated municipal and industrial wastewater a suitable economic means of augmenting the existing water supply, especially when compared to expensive alternatives such as desalination or the development of new water sources involving dams and reservoirs. Water reuse makes it possible to close the water cycle at a point closer to cities by producing “new water” from municipal wastewater and reducing wastewater discharge to the environment.

An important new concept in water reuse is the “fit-to-purpose” approach, which entails the production of reclaimed water quality that meets the needs of the intended end-users. In the situation of reclaimed water for irrigation, the reclaimed water quality can induce an adaptation of the type of plant grown. Thus, the intended water reuse applications are to govern the degree of wastewater treatment required and inversely, the reliability of wastewater reclamation processes and operation.

Treated wastewater can be used for various non-potable purposes. The dominant applications for the use of treated wastewater (also referred to as reclaimed water or recycled water) include agricultural irrigation, landscape irrigation, industrial reuse, and groundwater recharge. More recent and rapidly growing applications are for various urban, recreational, and environmental uses, and indirect and direct potable reuse.

Agricultural irrigation was, is, and will likely remain the largest reuse water consumer with recognized benefits and contribution to food security. Urban water recycling, landscape irrigation in particular, is characterized by fast development and will play a crucial role for the sustainability of cities in the future, including energy footprint reduction, human well-being, and environmental restoration.

The suitability of treated wastewater for a given type of reuse depends on the compatibility between the wastewater availability (volume) and water irrigation demand throughout the year, as well as on the water quality and the specific use requirements. Water reuse for irrigation can convey some risks for health and environment depending on the water quality, the irrigation water application method, the soil characteristics, the climate conditions, and the agronomic practices. Consequently, the public health and potential agronomic and environmental adverse impacts need to be considered as priority elements in the successful development of water reuse projects for irrigation. To prevent such potential adverse impacts, the development and application of international guidelines for the reuse of treated wastewater is essential.

The main water quality factors that determine the suitability of treated wastewater for irrigation are pathogen content, salinity, sodicity, specific ion toxicity, other chemical elements, and nutrients. Local health authorities are responsible for establishing water quality threshold values depending on authorized uses and they are also responsible for defining practices to ensure health and environmental protection taking in account local specificities.

From an agronomic point of view, the main limitation in using treated wastewater for irrigation arises from its quality. Treated wastewater, unlike water supplied for domestic and industrial purposes, contains higher concentrations of inorganic suspended and dissolved materials (total soluble salts, sodium, chloride, boron, and heavy metals), which can damage the soil and irrigated crops. Dissolved salts are not removed by conventional wastewater treatment technologies and appropriate good management, agronomic, and irrigation practices are intended to be used to avoid or minimize potential negative impacts.

The presence of nutrients (nitrogen, phosphorus, and potassium) can become an advantage due to possible saving in fertilizers. However, the amount of nutrients provided by treated wastewater along the irrigation period is not necessarily synchronized with crop requirements and the availability of nutrients depends on the chemical forms.

This document provides guidance for healthy, hydrological, environmental and good operation, monitoring, and maintenance of water reuse projects for unrestricted and restricted irrigation of agricultural crops, gardens, and landscape areas using treated wastewater. The quality of supplied treated wastewater should reflect the possible uses according to crop sensitivity (health-wise and