



**European Committee  
of the Regions**

**Commission for  
the Environment,  
Climate Change and Energy**

**ENVE**

# **Water Reuse – Legislative Framework in EU Regions**



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# List of abbreviations

|              |                                       |
|--------------|---------------------------------------|
| <b>BOD</b>   | Biochemical Oxygen Demand             |
| <b>CDR</b>   | Common Data Repository (Eionet)       |
| <b>COD</b>   | Chemical Oxygen Demand                |
| <b>CoR</b>   | Committee of the Regions              |
| <b>EC</b>    | Electrical Conductivity               |
| <b>FAO</b>   | Food and Agriculture Organisation     |
| <b>RBMP</b>  | River Basin Management Plan           |
| <b>TSS</b>   | Total Suspended Solids                |
| <b>UWWTD</b> | Urban Waste Water Treatment Directive |
| <b>WEI</b>   | Water Exploitation Index              |
| <b>WFD</b>   | Water Framework Directive             |
| <b>WWTP</b>  | Waste Water Treatment Plant           |

## Country codes:

|           |                |           |                 |
|-----------|----------------|-----------|-----------------|
| <b>AT</b> | Austria        | <b>IE</b> | Ireland         |
| <b>BE</b> | Belgium        | <b>IT</b> | Italy           |
| <b>BG</b> | Bulgaria       | <b>LT</b> | Lithuania       |
| <b>CY</b> | Cyprus         | <b>LU</b> | Luxembourg      |
| <b>CZ</b> | Czech Republic | <b>LV</b> | Latvia          |
| <b>DE</b> | Germany        | <b>MT</b> | Malta           |
| <b>DK</b> | Denmark        | <b>NL</b> | The Netherlands |
| <b>EE</b> | Estonia        | <b>PL</b> | Poland          |
| <b>EL</b> | Greece         | <b>PT</b> | Portugal        |
| <b>ES</b> | Spain          | <b>RO</b> | Romania         |
| <b>FI</b> | Finland        | <b>SE</b> | Sweden          |
| <b>FR</b> | France         | <b>SI</b> | Slovenia        |
| <b>HR</b> | Croatia        | <b>SK</b> | Slovakia        |
| <b>HU</b> | Hungary        | <b>UK</b> | United Kingdom  |

# Executive Summary

The purpose of the report ‘*Water Reuse – Legislative Framework in EU Regions*’ is to support the European Committee of the Regions (CoR) in the preparation of its opinion on the European Commission proposal for a Regulation on water reuse (COM(2018) 337 final)<sup>1</sup>. More specifically, the report contributes to the preparation of CoR opinion ENVE-VI/034 scheduled for adoption in December 2018 by providing:

- An inventory of legislation on water reuse in the different Member States;
- A comparative analysis of the existing legal frameworks in selected Member States and the EU proposal;
- Conclusions on the expected impact of the Regulation and the efforts required by the Member States to implement it.

Water stress already affects one third of the EU territory all year round while the growing demand for water in agricultural, industrial and urban uses and the climate change impacts put continuous pressure on the EU’s freshwater resources. As a result, the European Commission has stressed the importance of water reuse as a sustainable and effective way to meet water demand. In particular, reusing water after treatment can be a useful tool for integrated water management and can meet the water needs for irrigation or industrial uses. So far, only two EU instruments contain provisions that encourage water reuse: the Water Framework Directive (WFD, 2000/60/EC) and the Urban Waste Water Treatment Directive (UWWTD, 91/271/EEC). Nevertheless, these directives do not outline specific conditions for the reuse of treated wastewater<sup>2</sup>.

Even though water reuse takes place in the EU, particularly for irrigation in agriculture and aquifer recharge, this practice remains limited with differing concepts, principles and procedures applied in the different Member States. These differences of water reuse laws across the EU may affect the free movement of agricultural products irrigated with treated waste water, create unequal conditions of competition and, ultimately, disturb the functioning of the Internal Market. Therefore, in order to increase the uptake of water reuse in the EU and ensure a level-playing field, the Commission has put forward a proposal for a Regulation on water reuse<sup>3</sup>. The proposal defines minimum requirements for water reuse in irrigation depending on the food crop and the irrigation

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<sup>1</sup> European Commission, 2018, Proposal for a *Regulation of the European Parliament and of the Council on minimum requirements for water reuse*, COM(2018) 337 Final, 28.5.2018.

<sup>2</sup> European Commission, 2018, Commission staff working document, Impact Assessment, Accompanying the document Proposal for a Regulation [...] on minimum requirements for water reuse, SWD/2018/249 final/2.

<sup>3</sup> Ibid.

technique and prescribes measures for risk management to protect public health and the environment.

In order to understand the potential impact of the Regulation and the necessary efforts of Member States for its implementation, this report examines the level of water reuse and the existing legislation concerning water reuse, in general, and for agriculture, in particular, across the EU. As a first step, an inventory of all existing legislation on water reuse (including guidelines or any specific incentives) was compiled together with information about the amounts of water reused in the different Member States. The inventory suggests that, to date, the amount of water reuse remains limited, with evidence of some water reuse found only in five Member States. Moreover, comparable data on the topic for the different countries is not readily available due to different approaches in defining and measuring water reuse. Nevertheless, six Member States have standards on water reuse: Cyprus, Greece, France, Italy, Portugal and Spain. These standards are compulsory in all countries except for Portugal.

As a second step, and building upon the findings of the inventory, the provisions of the Commission proposal were compared to those of the standards and/or guidelines on water reuse in Cyprus, Greece, France, Italy, Portugal, and Spain.<sup>4</sup> The comparison of the Commission proposal's provisions and those of the legislation in the other six countries shows that the Member State legislation tends to cover broader uses for the reclaimed water than only agricultural irrigation. While all countries except Italy differentiate between different classes for reclaimed water for agricultural irrigation, they sometimes cover parameters and monitoring requirements different to those in the proposal. Moreover, the legislation in none of the six Member States has relevant provisions or provisions concerning validation monitoring, preparation of risk management plans and provision of information to the public as specific as the EU proposal.

The detailed results of the research carried out are presented in the rest of the report as follows: Part 1 gives an overview of the existing legislation on water reuse in the Member States, with further details on the inventory of legislation available in Annex 2; Part 2 provides a comparative analysis of the Commission proposal and the existing provisions on water reuse in selected Member States, with further details available in Annex 3; Part 3 provides conclusions. This report is based on a review of publicly available literature and information about Member State legislation (for a full list of the sources see Annex 1).

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<sup>4</sup> Even though the desk research suggested that some draft guidelines are being prepared in Malta, the consequent targeted research did not find any further information or drafts of these guidelines.



# Part 1: Inventory of legislation

Before examining the potential impact of the proposed Commission Regulation on water reuse, it is important to map the relevant legislation that already exists in the Member States as well as the current water reuse in the EU. For the purposes of this report ‘water reuse’ or ‘use of reclaimed water’ refer to water generated after treatment in wastewater treatment plants (WWTPs) to ensure it has the quality required for its intended uses, particularly irrigation in the agriculture sector. For each Member State, information was collected concerning the current and expected level of water reuse (in general) as well as any existing legislation that regulates water reuse for irrigation in agriculture. The information was gathered through desk research of publicly available literature, statistics and national information sources in order to allow cross-referencing and ensure the inventory provided in this report is comprehensive. Firstly, literature and statistics were reviewed to provide a list of existing legislation and water reuse in each Member State and to make a pre-selection of countries for further review. Secondly, targeted research was carried out for some of the pre-selected countries in order to clarify if relevant legislation and standards for water reuse existed and to finalise the selection of countries for further review in Part 2. The inventory of existing legislation on water reuse together with information about the water reuse in the different Member States is summarised in the following section. Annex 2 provides a detailed inventory.

## 1.1 Water reuse and relevant legislation across the EU

Water reuse can be promoted through different policy instruments. One type are standards that define minimum requirements for the reclaimed water before it can be reused for e.g. irrigation in agriculture, urban or recreational uses<sup>5</sup>. At the moment, only six Member States have such standards. In five of these countries (Cyprus, Greece, France, Italy and Spain) the standards are compulsory and included in the relevant water reuse legislation. In Portugal, the standards are not included in water reuse legislation but are enforced through the permitting requirements rules. In some Member States, guidelines for the reuse of water exist or are being prepared even though there is no binding legislation or quality standards for the moment (e.g. Belgium, Denmark, Malta). Although the majority of Member States do not have legislation or guidelines on water reuse yet, water reuse might be governed by other legislation e.g. permitting

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<sup>5</sup> The recreational and urban uses can include e.g. irrigation of parks, public green spaces and golf courses, road washing, car washing, fire-fighting.

procedures on wastewater discharge or drinking water requirements<sup>6</sup>. Annex 2 provides a complete inventory of the existing and, in a few cases planned, legislation and guidelines that directly address water reuse.

In addition, following the provisions of the WFD, Member States can decide to include water reuse measures as supplementary measures for addressing pressures on water resources in their River Basin Management Plans (RBMPs). The publicly available information on the latest WFD reporting<sup>7</sup> suggests that many Member States have included some water reuse measures in their second RBMPs. For example, in addition to the five countries<sup>8</sup> with existing water reuse standards, five other Member States have also defined water reuse measures in their RBMPs. At the same time, some countries provide financial or tax incentives that stimulate water reuse, although formal guidelines or standards are missing in their legislation<sup>9</sup>. An overview of these complementary approaches to address water reuse is provided in Annex 2.

However, water reuse in the EU remains limited and there is little quantitative information about the shares of water reclaimed and used in the different Member States. This is partly due to a differing understanding of what ‘water reuse’ covers or different approaches in estimating and presenting the data<sup>10</sup>. Existing sources suggest that in 2006 the total volume of reused reclaimed water in the EU was 964 million cubic metres per year (m<sup>3</sup>/year). In 2015, the total volume of reused treated wastewater in the EU was estimated at 1,100 million m<sup>3</sup>/year or 2.4% of the total volume of treated effluents<sup>11</sup>.

Nevertheless, the potential for water reuse in the EU is high. The Commission impact assessment of the proposed Regulation concludes that with the provisions of the proposal, water reuse in the EU can grow by 600,000 m<sup>3</sup>/year resulting in 1,700 million m<sup>3</sup>/year of reused water<sup>12</sup>. Estimates of the potential for water reuse in the different Member States by 2025 prepared by the AQUAREC project suggest that there is large potential for water reuse in many Member States, most notably in Spain, Italy, Bulgaria, Germany and France (see the following figure for details)<sup>13</sup>.

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<sup>6</sup> BIO Deloitte, ICF GHK and Cranfield University, 2015, Optimising water reuse in the EU, Final report –Part I.

<sup>7</sup> Information reported by the Member States to the EIONET Central Data Repository (CDR) concerning the implementation of the Water Framework Directive (2000/60/EC).

<sup>8</sup> Greece has not yet reported information to the EIONET CDR concerning the implementation of the WFD.

<sup>9</sup> TYPSA, 2013, Updated Report on Wastewater Reuse in the European Union.

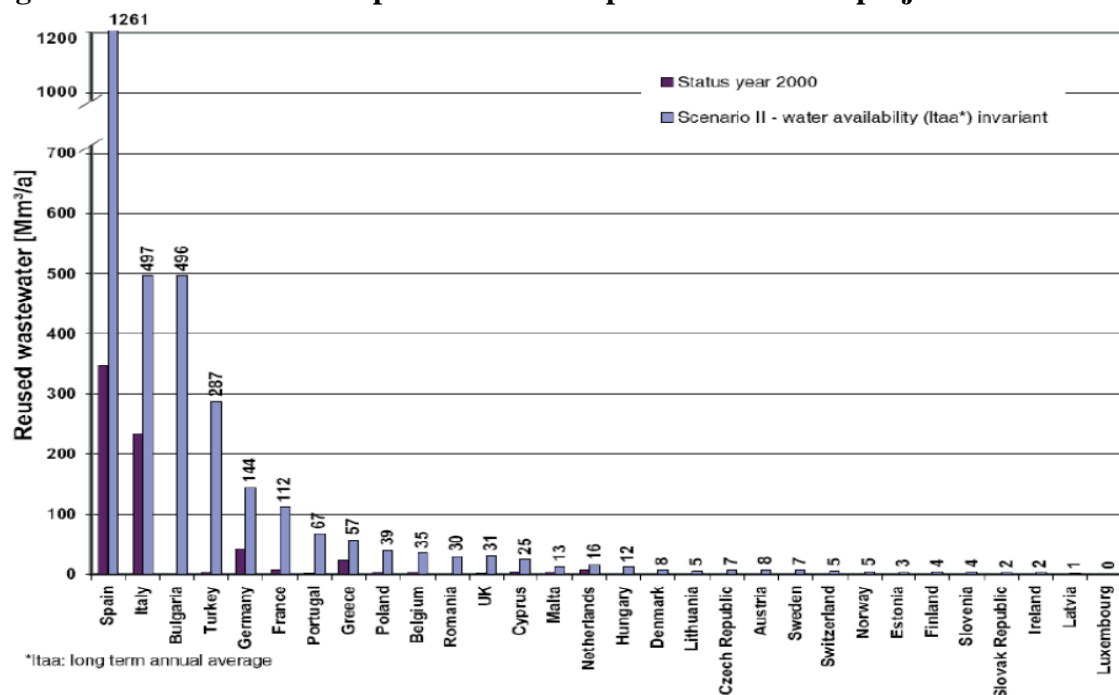
<sup>10</sup> BIO Deloitte, ICF GHK and Cranfield University, 2015, Optimising water reuse in the EU, Final report - Part I.

<sup>11</sup> Ibid.

<sup>12</sup> SWD/2018/249 final/2.

<sup>13</sup> BIO Deloitte, ICF GHK and Cranfield University, 2015, Optimising water reuse in the EU, Final report – Part I.

**Figure 1: Wastewater reuse potential in European countries on projection horizon 2025**



Source: Scenario II of AQUAREC project cited in BIO Deloitte, ICF GHK and Cranfield University, 2015, Optimising water reuse in the EU, Final report – Part I, p. 32.

The following table presents an overview of the current volume of water reused and existing relevant legislation in the different Member States.

**Table 1: Overview of the current water reuse and relevant legislation across the Member States**

| Member State | Current water reuse (million m <sup>3</sup> for 2015) <sup>14</sup> | Sectors where water is reused <sup>15</sup>             | Water reuse legislation and/or guidelines <sup>16</sup> |
|--------------|---|---|---|
| AT           | 0   | n/a   | No  |
| BE           | 0   | n/a   | Under preparation (guidelines)                          |
| BG           | 1.4   | Limited use in industry                                 | No  |
| CY           | 30.05   | Mainly agriculture but also urban and recreational uses | Yes   |
| CZ           | n/a   | n/a   | No  |
| DE           | n/a   | Ecological use in some regions                          | No  |
| DK           | n/a   | n/a   | Guidelines on hygiene for food businesses               |
| EE           | n/a   | Limited use in industry                                 | No  |
| EL           | n/a   | n/a   | Yes   |

<sup>14</sup> Based on Eurostat data: Eurostat, 2018, Water use balance statistics, downloaded from: [http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=env\\_wat\\_bal&lang=en](http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=env_wat_bal&lang=en) (last accessed 24 Aug 2018).

<sup>15</sup> Based on TYPSA, 2013, Updated Report on Wastewater Reuse in the European Union.

<sup>16</sup> Based on the following sources: TYPSA, 2013, Updated Report on Wastewater Reuse in the European Union; JRC, 2014, Water Reuse in Europe, Relevant guidelines, needs for and barriers to innovation; BIO Deloitte, ICF GHK and Cranfield University, 2015, Optimising water reuse in the EU, Final report – Part I; and Amec Foster Wheeler Environment et al. 2016, EU-level instruments on water reuse, Final report to support the Commission’s Impact Assessment.

| Member State | Current water reuse (million m <sup>3</sup> for 2015) <sup>14</sup> | Sectors where water is reused <sup>15</sup>                                     | Water reuse legislation and/or guidelines <sup>16</sup> |
|--------------|---|---|---|
| ES           | 530 (for 2014)  | Mainly agriculture but also urban, recreational, industrial and ecological uses | Yes   |
| FI           | n/a   | n/a   | No  |
| FR           | n/a   | Agriculture, industrial and urban uses  | Yes   |
| HR           | n/a   | n/a   | No  |
| HU           | 0   | n/a   | No  |
| IE           | n/a   | n/a   | No  |
| IT           | n/a   | Agriculture and industry  | Yes   |
| LT           | 0   | n/a   | No  |
| LU           | 0   | n/a   | No  |
| LV           | 0   | n/a   | No  |
| MT           | 0.97  | Mainly for agriculture and industrial laundry                                   | Under preparation (guidelines)                          |
| NL           | 0   | Limited use in agriculture, ecological and urban uses                           | No  |
| PL           | n/a   | n/a   | No  |
| PT           | n/a   | Agriculture and urban uses  | Yes   |
| RO           | n/a   | n/a   | No  |
| SE           | n/a   | n/a   | No  |
| SI           | 22.1  | n/a   | No  |
| SK           | n/a   | n/a   | No  |
| UK           | n/a   | Recreational and urban uses   | No  |

Notes: n/a = not available. The information concerning the amount of water reused is based on the latest available data from Eurostat. However, there are a significant number of Member States, for which no information is available or reported, while it remains unclear if the Member States, which reported, used the same approaches for estimating these amounts.

Considering the existence of relevant water reuse legislation, the amount of current and projected water reuse, the following countries were selected for further analysis in Part 2: Cyprus, Greece, Spain, France, Italy, Portugal and Malta. The latter was selected for its level of current water reuse and plans to adopt relevant guidelines. Even though there is indication for some guidelines in Belgium and Denmark, no evidence of current water reuse or specific standards for irrigation with reclaimed water was found. For the countries where there is indication of current water reuse, namely Bulgaria and Slovenia, the targeted desk research did not find any evidence of relevant legislation on water reuse in agriculture. Consequently, these Member States were excluded from the in-depth analysis.

## Part 2: Analysis of the selected Member States

Building upon the inventory of legislation and the selection of countries for further analysis in Part 1, this section compares the provisions of the existing legal framework in the selected Member States with those of the Commission proposal. Information about the existing legislation in the selected countries was collected through targeted desk research of publicly available information (including relevant legal documents and literature) by country experts with knowledge of the languages and legal systems in the selected Member States. The information collected for each country was then compared to the provisions of the Commission proposal in order to summarise the elements that are different and to help identify the territories in which the EU Regulation will have the highest impact.

In particular, the comparison covers several key aspects:

1. Permits and competent authorities – what are the relevant authorities and division of powers (national, regional and local) regarding water reuse?
2. Reclaimed water provisions:
  - a. Use of reclaimed water – what uses of reclaimed water are covered?
  - b. Classes of reclaimed water – what specific classes of reclaimed water are covered?
  - c. Requirements for the reclaimed water – how do the parameters compare to those in the Commission proposal? Are the parameters in the proposal more or less restrictive?
  - d. Monitoring requirements – what are the monitoring requirements? Would the provisions in the Commission proposal be more or less restrictive?
  - e. Validation monitoring – what are the requirements for validation monitoring? Would the provisions in the Commission proposal be more or less restrictive?
3. Water Reuse Risk Management Plan – what relevant provisions exist and how do they compare to the Commission proposal?
4. Information to the public – what relevant provisions exist and how do they compare to the Commission proposal?

The results of the comparison for each Member State are provided in the following sections together with a summary of the provisions in the Commission proposal. Detailed information sheets for the proposal and the national legislation in the selected countries are provided in Annex 3.

## 2.1 Overview of the proposed EU Regulation

The proposal for a Regulation on water reuse<sup>17</sup> aims to lay down minimum requirements for water quality, monitoring and risk management for the safe reuse of treated urban wastewater in order to guarantee protection of human and animal health and the environment, while also addressing water scarcity. More specifically, it covers agricultural irrigation of food crops consumed raw, processed food crops and non-food crops. The proposal requires reclamation plant operators to ensure the reclaimed water for agricultural irrigation complies with a set of minimum requirements laid down in the proposal and any additional conditions set by the Member States. The Annex<sup>18</sup> of the proposal defines minimum requirements for the following parameters:

- Microbiological parameters: Escherichia coli (E.coli), Legionella and intestinal nematodes (Helminth eggs);
- Physical-chemical parameters: Biochemical Oxygen Demand 5 (BOD5), Total Suspended Solids (TSS) and turbidity.

In addition, reclamation plant operators have to prepare Water Reuse Risk Management Plans based on key risk management tasks such as identification of potential hazards, environment and population at risk, assessment of the environmental and human health risks and identification of preventive measures. Furthermore, the proposal sets out requirements about the information that Member States should make available to the public concerning water reuse, including the quantity and quality of the reclaimed water, permits granted or modified and results of the compliance checks stemming from the Regulation. Annex 3 provides an information sheet detailing the main provisions of the proposal for a Regulation on water reuse.

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<sup>17</sup> European Commission, 2018, Proposal for a *Regulation of the European Parliament and of the Council on minimum requirements for water reuse*, COM(2018) 337 Final, 28.5.2018.

<sup>18</sup> European Commission, 2018, Annexes to the Proposal for a *Regulation of the European Parliament and of the Council on minimum requirements for water reuse*, COM(2018) 337 final, 28.5.2018.

## 2.2 Cyprus

Water stress is a significant issue in Cyprus: the country depends on rainfall to meet its water demands as groundwater and surface water resources are limited, it often suffers droughts that have increased in magnitude and frequency with time and its Water Exploitation Index (WEI) is around 72% (2015)<sup>19,20</sup>. Consequently, in 2005 Cyprus defined water quality standards for wastewater reuse and became one of the Member States with water reuse provisions fully integrated into the national legislation on urban wastewater treatment and discharge. In addition, the country has a national objective to replace 40% of the agricultural freshwater requirements with reclaimed water<sup>21</sup>. Currently, treated wastewater is reused for the irrigation of agricultural land, parks, gardens and public green areas<sup>22</sup>.

Quality standards for the reclaimed water are outlined according to the source of the treated wastewater considering whether the treated water comes from agglomerations with less or more than 2,000 population equivalent (p.e.)<sup>23</sup>. Furthermore, the Code for Good Agricultural Practice provides guidelines for ensuring the protection of public health and the environment while the ‘Control of water pollution’ law and its associated acts outline legally-binding limit values for a range of parameters applied at the wastewater treatment plant (WWTP) outlet. Limit values and quality requirements are defined for over 20 micro-biological and physical-chemical parameters<sup>24</sup>. Irrigation with treated wastewater is prohibited for leafy vegetables, bulbs or tubers that are eaten raw<sup>25</sup>, crops for export and ornamental plants<sup>26</sup>.

Compared to the Commission proposal for a Regulation on water reuse, the Cypriot legislation covers more uses, classes of reclaimed water and parameters for control. At the same time, the monitoring frequency set out for some of these parameters is less stringent than in the Commission proposal. Moreover, the

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<sup>19</sup> SWD/2018/249 final/2, Annex 6 and Eurostat, 2018, Water Exploitation Index: [https://ec.europa.eu/eurostat/tgm/table.do?tab=table&init=1&language=en&pcode=t2020\\_rd220&plugin=1](https://ec.europa.eu/eurostat/tgm/table.do?tab=table&init=1&language=en&pcode=t2020_rd220&plugin=1) (last accessed 20 September 2018).

<sup>20</sup> The WEI indicator takes into account a country’s annual water abstraction (from renewable freshwater, groundwater and surface sources) in a country as a percentage of its long-term average available water resources. According to Amec Foster Wheeler Environment et al. (2016), a WEI above 20% indicates that the water resources are under stress.

<sup>21</sup> SWD/2018/249 final/2, Annex 6.

<sup>22</sup> BIO Deloitte, ICF GHK and Cranfield University, 2015, Optimising water reuse in the EU, Final report – Part I, Annex B and Annex E.

<sup>23</sup> SWD/2018/249 final/2, Annex 6;

<sup>24</sup> BIO Deloitte, ICF GHK and Cranfield University, 2015, Optimising water reuse in the EU, Final report – Part I, Annex B and Annex E.

<sup>25</sup> Ibid.

<sup>26</sup> SWD/2018/249 final/2, Annex 6.

national framework does not outline any specific provisions for validation monitoring, development of risk management plans or provision of information to the public. The following table provides a summary of the key provisions, highlighting the main differences between the national legal framework and the Commission proposal in red. Annex 3 provides an information sheet detailing the main provisions of the Cypriot legislation on water reuse.

**Table 2: Comparison of the provisions between the Commission proposal and the existing legislation on water reuse in Cyprus**

| Provisions in the proposal   | Comparison with the existing legislation in Cyprus   |
|--|--|
| 1. Permits & competent authorities: permits to supply reclaimed water are required together with compliance checks                                 | A relevant set-up already exists: Permits can be requested from the competent authority (the Ministry of Agriculture, Rural Development and Environment) while inspectors appointed by the competent authority can perform checks.   |
| 2a.Use of reclaimed water: agricultural irrigation   | The proposal covers fewer uses: The national legislation covers not only agricultural irrigation but also recreational and environmental uses e.g. irrigation of landscape and aquifer recharge.   |
| 2b.Classes of reclaimed water: 4 classes according to crops and irrigation technology  | Similar classes are covered: The national legislation covers 4 classes of reclaimed water for agricultural irrigation (in addition there is one class concerning recreational uses) based on the type of crops and plants. However, it covers a wider range of plants and includes also vineyards and trees.   |
| 2c.Requirements for the reclaimed water for: Legionella, intestinal nematodes (helminth eggs), E.coli, BOD5, TSS, turbidity                        | <b>Different parameters are covered:</b><br>The national legislation defines requirements for over 20 parameters, which includes 4 parameters covered in the proposal (E.coli, intestinal nematodes, BOD5 and TSS) together with e.g. chemical oxygen demand (COD), pH, heavy metals and metalloids, electrical conductivity (EC), chlorides, nitrogen and phosphorus.                           |
| 2d.Monitoring requirements: from once a week to twice a month depending on the parameter and class of reclaimed water                              | <b>Different monitoring requirements:</b><br>The monitoring frequency defined in the national legislation depends on the parameter but is generally less frequent compared to the EU proposal e.g. the most frequent monitoring is needed for pH (three times per week) while for most parameters monitoring is needed once every 15 days (E.coli, TSS, BOD5, COD, EC, nitrogen and phosphorus). |
| 2e.Validation monitoring: required before the reclamation plant is put into operation, upgraded or modified (relevant for food crops consumed raw) | <b>The proposal is more specific:</b><br>Provisions for validation monitoring were not identified in the Cypriot legislation.  |
| 3.Water Reuse Risk Management Plan   | <b>The proposal is more specific:</b><br>Provisions for risk management plans were not identified in the Cypriot legislation.  |
| 4. Information to the public   | <b>The proposal is more specific:</b><br>Provisions for providing information to the public were not identified in the Cypriot legislation.  |



## 2.3 France

France does not experience severe water stress and its WEI is around 16% (2012)<sup>27</sup>. Nevertheless, the periods of low water periods are increasing with time and some regions start to face water scarcity (e.g. 20 departments are subject to regular abstraction restrictions), while water demand for agriculture and certain crops grows<sup>28</sup>. Consequently, France has adopted standards for water reuse in the agricultural sector and the irrigation of green and recreational areas. Currently, water reuse projects cover over 3,000 ha of land and mainly concern irrigation of: market gardening crops, orchard fruit, cereals, tree plantations and forests, grasslands, gardens and golf courses<sup>29</sup>.

The quality standards for reclaimed water in France are strongly linked to the national legislation on the agricultural spreading of sewage sludge resulting in quality monitoring of not only the reclaimed water but also of the sewage sludge and agricultural soils<sup>30</sup>. Legally binding standards for the quality of the reclaimed water and the minimum risk management measures to be taken by WWTP operators were introduced in 2010. There are limit values for six parameters and water reuse is allowed for a variety of crops including food crops for human consumption, flowers, fodder crops, fruit production and forests with limited public access. The legislation prohibits: irrigation with raw sludge or sludge that does not meet the limit values for agricultural use or with wastewater from WWTPs connected to certain animal by-products processing; irrigation with treated wastewater on soils that do not meet the limit values for agricultural use of sewage sludge or within close protection perimeters of drinking water abstraction points<sup>31</sup>. In addition, the WWTP operators are required to implement a monitoring programme that covers not only the water reuse parameters but also the quality of sewage sludge and to communicate the results to the department prefect, the mayors and users of the irrigated land<sup>32</sup>.

Compared to the Commission proposal for a Regulation on water reuse, the French legislation is similar concerning the uses, classes and monitoring requirements of reclaimed water. There is a difference in the parameters monitored, while the requirements concerning risk management and provision of information to the public are more general compared to those in the EU

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<sup>27</sup> Eurostat, 2018, Water Exploitation Index.

<sup>28</sup> Amec Foster Wheeler Environment et al. 2016, EU-level instruments on water reuse, Final report to support the Commission's Impact Assessment, Appendix D2.

<sup>29</sup> Ibid.

<sup>30</sup> BIO Deloitte, ICF GHK and Cranfield University, 2015, Optimising water reuse in the EU, Final report – Part I, Annex B and Annex E.

<sup>31</sup> Amec Foster Wheeler Environment et al. 2016, EU-level instruments on water reuse, Final report to support the Commission's Impact Assessment, Appendix D2.

<sup>32</sup> Ibid.

proposal. The following table provides a summary of the key provisions, highlighting the main differences between the national legal framework and the Commission proposal in red. Annex 3 provides an information sheet detailing the main provisions of the French legislation on water reuse.

**Table 3: Comparison of the provisions between the Commission proposal and the existing legislation on water reuse in France**

| Provisions in the proposal  | Comparison with the existing legislation in France  |
|---|---|
| 1. Permits & competent authorities: permits to supply reclaimed water are required together with compliance checks                                  | A relevant set-up already exists:<br>Permits for use of reclaimed water for irrigation can be requested by the owner or the operator of the WWTP, the irrigation system or the land to be irrigated and can be requested from the department prefect. The applications should be accompanied by information about e.g. technical information about the WWTP, a risk analysis and an assessment of the public health and environmental impacts of the project. |
| 2a. Use of reclaimed water: agricultural irrigation   | The proposal covers fewer uses:<br>The national legislation covers agricultural watering/ spraying or irrigation (crops but also forests) and recreational uses e.g. irrigation of green spaces.  |
| 2b. Classes of reclaimed water: 4 classes according to crops and irrigation technology  | Similar classes are covered:<br>The national legislation covers 3 classes of reclaimed water use for agricultural irrigation based on the types of crops. However, it covers also pastures/grasslands and fruit trees.  |
| 2c. Requirements for the reclaimed water for: Legionella, intestinal nematodes (helminth eggs), E.coli, BOD5, TSS, turbidity                        | <b>Different parameters are covered:</b><br>The national legislation has defined requirements, depending on the class of water reuse, for 6 parameters, including some covered in the proposal (E.coli, BOD and turbidity) and some not included in the proposal (faecal enterococcus, F-specific bacteriophage and spores of anaerobic sulphate-reducing microorganisms).  |
| 2d. Monitoring requirements: from once a week to twice a month depending on the parameter and class of reclaimed water                              | Similar monitoring requirements:<br>The monitoring frequency depends on the class of water reuse, ranging from once a week to monitoring once a month. For the parameters E.coli, BOD and turbidity is the same as the requirements in the proposal.  |
| 2e. Validation monitoring: required before the reclamation plant is put into operation, upgraded or modified (relevant for food crops consumed raw) | <b>The proposal is more specific:</b><br>Provisions for validation monitoring were not identified in the French legislation.  |
| 3. Water Reuse Risk Management Plan   | <b>The proposal is more specific:</b><br>The national legislation does not refer to a "Risk Management Plan" but requires an analysis of the risks (related to malfunction of the treatment and distribution networks) to be performed as part of the request for a permit.   |
| 4. Information to the public  | <b>The proposal is more specific:</b><br>The national legislation includes specific provisions only for informing the public in green spaces (through information boards that indicate treated water is used, remind the hygienic recommendations and prohibit the access until two hours after irrigation).  |

## 2.4 Greece

Although Greece faces less water stress than other Mediterranean countries and its WEI is around 14% (2015)<sup>33</sup>, its territories face different levels of water scarcity, with some of its river basin districts being among the most water scarce in the EU. Furthermore, water pressure is higher in the second and third quarter of the year due to increased demand from the agricultural and tourism sectors that constitute two of the main economic activities in the country<sup>34</sup>. Even though Greece has adopted quality standards and regulations for the use of treated wastewater for a variety of purposes (e.g. agricultural, recreational, industrial) and has very high compliance with the UWWTD, water reuse remains relatively low. Economic (e.g. illegal water abstraction for irrigation), technical (e.g. the complexity of the national standards) and social (e.g. limited acceptance of water reuse by farmers) reasons are thought to limit and delay the broader uptake of water reuse in Greece. Consequently, reclaimed water is used mainly to irrigate olive or other trees<sup>35</sup>.

The quality standards for water reuse allow irrigation with reclaimed water for a variety of crops including food crops for human consumption, trees and meadows. There are limit values for a large number of parameters with some very stringent requirements for certain parameters (e.g. E.coli and BOD5)<sup>36</sup>. Compared to the Commission proposal for a Regulation on water reuse, the Greek legislation covers more uses, classes of reclaimed water and parameters for control. At the same time, the parameters and monitoring frequency differ. Moreover, the national framework does not outline any specific provisions for validation monitoring, development of risk management plans or provision of information to the public. The following table provides a summary of the key provisions, highlighting the main differences between the national legal framework and the Commission proposal in red. Annex 3 provides a detailed information sheet about the main provisions of the Greek legislation on water reuse.

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<sup>33</sup> Eurostat, 2018, Water Exploitation Index.

<sup>34</sup> Amec Foster Wheeler Environment et al. 2016, EU-level instruments on water reuse, Final report to support the Commission's Impact Assessment, Appendix D3.

<sup>35</sup> Amec Foster Wheeler Environment et al. 2016, EU-level instruments on water reuse, Final report to support the Commission's Impact Assessment, Appendix D3; and BIO Deloitte, ICF GHK and Cranfield University, 2015, Optimising water reuse in the EU, Final report – Part I, Annex B and Annex E.

<sup>36</sup> Ibid.

**Table 4: Comparison of the provisions between the Commission proposal and the existing legislation on water reuse in Greece**

| Provisions in the proposal  | Comparison with the existing legislation in Greece  |
|---|---|
| 1. Permits & competent authorities: permits to supply reclaimed water are required together with compliance checks                                  | A relevant set-up already exists:<br>Permits for reuse of treated wastewater can be requested by the user or the Recovery Water Management Authority from the relevant Decentralized Directorate of Water Management. This application must be accompanied by a study of the design and operation of the activity complying with relevant environmental conditions defined in the legislation. The Decentralized Directorate of Water Management in cooperation with the relevant departments performs regular and emergency checks in order to verify compliance with the terms and conditions requirements laid down in the permit. |
| 2a. Use of reclaimed water: agricultural irrigation   | The proposal covers fewer uses:<br>The national legislation covers not only agricultural irrigation (including of forestland) but also recreational, urban (e.g. fire-fighting, road cleaning), environmental (e.g. restoration of natural environment) and industrial uses (e.g. for cooling, recharging boiler water).  |
| 2b. Classes of reclaimed water: 4 classes according to crops and irrigation technology  | Similar classes are covered:<br>The national legislation covers 2 classes of reclaimed water for agricultural irrigation (in addition there is one class concerning urban uses) based on the crops and irrigation techniques. However, it covers also vineyards, trees and meadows.   |
| 2c. Requirements for the reclaimed water for: Legionella, intestinal nematodes (helminth eggs), E.coli, BOD5, TSS, turbidity                        | <b>Different parameters are covered:</b><br>The national legislation has defined requirements for a large number of parameters (65 parameters are monitored <sup>37</sup> ) depending on the class of water reuse. This includes some parameters covered in the proposal (E.coli, BOD, TSS and turbidity) and some other parameters e.g. pH, EC, heavy metals and metalloids, chlorides, nitrogen and phosphorus.   |
| 2d. Monitoring requirements: from once a week to twice a month depending on the parameter and class of reclaimed water                              | <b>Different monitoring requirements:</b><br>The monitoring frequency depends on the class of water reuse and the parameters covered ranging from once or twice per week to every 1-2 weeks. For the parameters covered in the proposal, the Greek legislation requires more frequent monitoring of E.coli (up to four times per week) but it asks for less monitoring of the other parameters.   |
| 2e. Validation monitoring: required before the reclamation plant is put into operation, upgraded or modified (relevant for food crops consumed raw) | <b>The proposal is more specific:</b><br>Provisions regarding validation monitoring in the sense of the proposal were not identified in the Greek legislation. However, there are provisions that prior to the issue of the reuse permit, the Decentralized Directorate of Water Management and the other competent authorities shall carry out a relevant inspection to determine that the organization, construction and operation of this installation are consistent with the submitted study and are compatible with any approved environmental conditions of the particular activity.   |
| 3. Water Reuse Risk Management Plan   | <b>The proposal is more specific:</b><br>Provisions for risk management plans were not identified in the Greek legislation.   |
| 4. Information to the public  | <b>The proposal is more specific:</b><br>Provisions for providing information to the public were not identified in the Greek legislation.   |

<sup>37</sup> JRC, 2014, Water Reuse in Europe, Relevant guidelines, needs for and barriers to innovation.

## 2.5 Italy

Italy is subject to water scarcity, especially in the south, and as such, water reuse has become part of long-term water management – around 233 million m<sup>3</sup>/year<sup>38</sup> - mostly for agricultural use. Indeed, the largest European water reuse scheme for agricultural irrigation is located near Milan, where approximately 86 million m<sup>3</sup>/year of reclaimed water is used for irrigation of rice, corn, grass and horticulture<sup>39</sup>.

In Italy, the national legislation sets out quality standards for agricultural, urban, and industrial application, but regional authorities may impose stricter quality standards. This study focuses only on national legislation; however, it should be noted that many regions have imposed stricter quality standards, bringing the quality of reclaimed water almost to the same standard as drinking water, even for non-potable uses<sup>40</sup>.

Compared to the Commission proposal for a Regulation on water reuse, the Italian framework is quite detailed concerning the parameters controlled (and monitored). However, the Italian framework neither differentiates water uses into classes, nor, despite a high number of parameters identified, are all the parameters in the proposal identified (especially bacterial parameters and nematodes). Moreover, the national framework does not include requirements for the provision of information to the public, the development of risk management plans, or validation monitoring. The following table provides a summary of the key provisions, highlighting the main differences between the national legal framework and the Commission proposal in red. Annex 3 provides a detailed information sheet about the main provisions of the Italian legislation on water reuse.

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<sup>38</sup> Figures from 2006. BIO Deloitte, ICF GHK and Cranfield University, 2015, Optimising water reuse in the EU, Final report.

<sup>39</sup> BIO Deloitte, ICF GHK and Cranfield University, 2015, Optimising water reuse in the EU, Final report – Part I.

<sup>40</sup> Angelakis et al. (2007) Wastewater recycling and reuse in EUREAU countries – Report for EUREAU cited in BIO Deloitte, ICF GHK and Cranfield University, 2015, Optimising water reuse in the EU, Final report –Part I.

**Table 5: Comparison of the provisions between the Commission proposal and the existing legislation on water reuse in Italy**

| Provisions in the proposal  | Comparison with the existing legislation in Italy  |
|---|--|
| 1. Permits & competent authorities: permits to supply reclaimed water are required together with compliance checks                                  | A relevant set-up already exists:<br>The current framework has provisions for authorisation by the competent authority, which is usually the province.   |
| 2a. Use of reclaimed water: agricultural irrigation   | The proposal covers fewer uses:<br>The national legislation covers additional uses of reclaimed water than agricultural irrigation e.g. civil purposes and industrial purposes, and irrigation of green or recreation and sports areas.  |
| 2b. Classes of reclaimed water: 4 classes according to crops and irrigation technology  | <b>The proposal defines classes of reclaimed water:</b><br>The national legislation only defines the reclaimed water uses, rather than classes.  |
| 2c. Requirements for the reclaimed water for: Legionella, intestinal nematodes (helminth eggs), E.coli, BOD5, TSS, turbidity                        | <b>Different parameters are covered:</b><br>The national legislation sets out standards for BOD5 and TSS that are similar to those set out in the proposal but does not cover the other parameters from the proposal. However, it sets out standards for a large number of additional parameters (55 parameters are monitored <sup>41</sup> ) including EC, pH, heavy metals and metalloids, COD, nitrogen and phosphorus. |
| 2d. Monitoring requirements: from once a week to twice a month depending on the parameter and class of reclaimed water                              | <b>Different monitoring requirements:</b><br>The monitoring requirements are not set out in the national legislation, but rather in the regional legislation.  |
| 2e. Validation monitoring: required before the reclamation plant is put into operation, upgraded or modified (relevant for food crops consumed raw) | <b>The proposal is more specific:</b><br>Provisions for validation monitoring were not identified in the Italian legislation.  |
| 3. Water Reuse Risk Management Plan   | <b>The proposal is more specific:</b><br>Provisions for water reuse risk management plans were not identified in the Italian legislation. The legislation refers only to compliance with a code of good practice in the agricultural sector adopted by governmental decree in 1999.  |
| 4. Information to the public  | <b>The proposal is more specific:</b><br>Provisions for information to the public were not identified in the Italian legislation.  |

<sup>41</sup> JRC, 2014, Water Reuse in Europe, Relevant guidelines, needs for and barriers to innovation.

## 2.6 Portugal

Portugal experiences severe water scarcity, and water reuse is thus considered an integral and effective component of long-term water resources management. However, only about 1% of treated wastewater was reused in 2011 (6.1 million m<sup>3</sup>), and the vast majority of this was used by water treatment companies for internal use<sup>42</sup>.

The relevant Portuguese legislation is in the form of provisions for standards as a basis for the delivery of reuse permits – they become legally-binding once they are included in the reuse permits<sup>43</sup>. The quality levels correspond to those recommended by the Food and Agriculture Organisation (FAO) guidelines for wastewater treatment and use in agriculture (with minor exceptions) and refer to a variety of uses. However, it should be noted that irrigation of vegetables whose edible parts may be in close contact with treated wastewater is forbidden<sup>44</sup>.

Compared to the Commission proposal for a Regulation on water reuse, the Portuguese framework is quite detailed concerning the parameters controlled (and monitored). However, the Portuguese framework neither differentiates water uses into classes, nor are all the parameters in the proposal identified. Moreover, although the national framework does include requirements for the provision of information to the public, these do not correspond to the proposal. Similarly, although some elements do exist, the development of risk management plans or validation monitoring are not included in the existing framework. The following table provides a summary of the key provisions, highlighting the main differences between the national legal framework and the Commission proposal in red. Annex 3 provides a detailed information sheet about the main provisions of the Portuguese legislation on water reuse.

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<sup>42</sup> ERSAR (2012) Relatório anual dos serviços de águas e resíduos em Portugal, cited in BIO Deloitte, ICF GHK and Cranfield University, 2015, Optimising water reuse in the EU, Final report – Part I.

<sup>43</sup> BIO Deloitte, ICF GHK and Cranfield University, 2015, Optimising water reuse in the EU, Final report – Part I.

<sup>44</sup> Ibid.

**Table 6: Comparison of the provisions between the Commission proposal and the existing legislation on water reuse in Portugal**

| Provisions in the proposal  | Comparison with the existing legislation in Portugal   |
|---|--|
| 1. Permits & competent authorities: permits to supply reclaimed water are required together with compliance checks                                  | A relevant set-up already exists:<br>The current framework has provisions for permitting by the competent authority, namely the Administration of Hydrographical Region - part of the Portuguese Environmental Agency.   |
| 2a. Use of reclaimed water: agricultural irrigation   | The proposal covers fewer uses:<br>The national legislation covers additional uses of reclaimed water than agricultural irrigation such as recreational uses (e.g. irrigation in public parks, sports lawns), industrial uses, environmental uses, and non-potable urban uses (e.g. street cleaning, car washing, etc.).   |
| 2b. Classes of reclaimed water: 4 classes according to crops and irrigation technology  | <b>The proposal defines classes of reclaimed water:</b><br>The requirements from the national legislation apply to all intended uses, except for crops that are not eaten raw, for which the limits for faecal coliforms are less stringent.   |
| 2c. Requirements for the reclaimed water for: Legionella, intestinal nematodes (helminth eggs), E.coli, BOD5, TSS, turbidity                        | <b>Different parameters are covered:</b><br>There do not appear to be parameters concerning Legionella spp, BOD5, or turbidity (mentioned in the proposal), however, there are also parameters for pH, EC, total dissolved solids, sodium absorption ratio, and chlorides.   |
| 2d. Monitoring requirements: from once a week to twice a month depending on the parameter and class of reclaimed water                              | <b>Different monitoring requirements:</b><br>Monitoring is to be carried out at the exit of the UWWTP, at the delivery point to the user, and the site the water is used. The sampling frequency ranges from weekly (e.g. for turbidity) to monthly (e.g. for Helminth eggs) and yearly (e.g. for phosphorus and soil pH. Once in five years is required for heavy metals.   |
| 2e. Validation monitoring: required before the reclamation plant is put into operation, upgraded or modified (relevant for food crops consumed raw) | <b>The proposal is more specific:</b><br>Provisions for validation monitoring were not identified in the Portuguese legislation.   |
| 3. Water Reuse Risk Management Plan   | <b>The proposal is more specific:</b><br>Provisions for risk management plans are not included in the national legislation, although a general management plan (including the physical and biological treatment of treated waste water and soil) is prepared at the time of the permit application.  |
| 4. Information to the public  | <b>The proposal is more specific:</b><br>Provisions for information to the public include information about the objectives of the project, the benefits, the possible alternatives, and the costs of those alternatives. The public is to be informed and allowed to be involved from an early stage in the process. However, the proposal requires more information on the implementation process (amount reused, monitoring results etc.). |



## 2.7 Spain

In Spain, the level of water reuse was estimated at over 500 million m<sup>3</sup>/year (2014/2015)<sup>45</sup>, making Spain the largest European reuser of water, in terms of volume. The vast majority of this water is used for agriculture. Water reuse is an accepted practice, as Spain is subject to water scarcity. Legislation at national level is complemented by more comprehensive guidelines developed by certain regions (for example Andalusia, Balearic Island and Catalonia)<sup>46</sup>.

The national legal framework for water reuse in Spain is quite advanced and outlines comprehensive quality criteria (not only limit values but also for presence-absence of certain parameters according to the type of water use) and risk management measures. The latter cover the minimum sampling and analysis frequencies as well as requirements for including a section on planned risk management measures in the applications for permits<sup>47</sup>. The national legislation is complemented by an implementation guide that gives recommendations on procedures and good practices<sup>48</sup>.

In many ways the Commission proposal for a Regulation on water reuse is similar to the Spanish legislation. Similar parameters are defined and applied to different classes of water use (for example for certain uses or irrigation methods all six parameters defined in the EU proposal are monitored under the Spanish legislation<sup>49</sup>). However, the Spanish legislation is more detailed in terms of quality requirements, monitoring, and uses of reclaimed water. At the same time, it does not include provisions for validation monitoring, water reuse risk management plans, nor detailed information to the public. The following table provides a summary of the key provisions, highlighting the main differences between the national legal framework and the Commission proposal in red. Annex 3 provides an information sheet detailing the main provisions of the Spanish legislation on water reuse.

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<sup>45</sup> Eurostat, 2018, Water use balance statistics and BIO Deloitte, ICF GHK and Cranfield University, 2015, Optimising water reuse in the EU, Final report –Part I.

<sup>46</sup> BIO Deloitte, ICF GHK and Cranfield University, 2015, Optimising water reuse in the EU, Final report – Part I.

<sup>47</sup> Amec Foster Wheeler Environment et al. 2016, EU-level instruments on water reuse, Final report to support the Commission’s Impact Assessment, Appendix D5.

<sup>48</sup> BIO Deloitte, ICF GHK and Cranfield University, 2015, Optimising water reuse in the EU, Final report – Part I.

<sup>49</sup> JRC, 2014, Water Reuse in Europe, Relevant guidelines, needs for and barriers to innovation.

**Table 7: Comparison of the provisions between the Commission proposal and the existing legislation on water reuse in Spain**

| Provisions in the proposal  | Comparison with the existing legislation in Spain  |
|---|--|
| 1. Permits & competent authorities: permits to supply reclaimed water are required together with compliance checks                                  | A relevant set-up already exists:<br>The current framework has provisions for permitting by the competent authority, which is the territorial basin organisation. The permitting process depends on the type of applicant.   |
| 2a. Use of reclaimed water: agricultural irrigation   | The proposal covers fewer uses:<br>The national legislation covers additional uses of reclaimed water than agricultural irrigation e.g. urban use (including residential use, fire systems), industrial uses, recreational use (including golf course irrigation, ponds), environmental use (including aquifer recharge, groundwater recharge, forestry, wetland maintenance).   |
| 2b. Classes of reclaimed water: 4 classes according to crops and irrigation technology  | Similar classes are covered:<br>The national legislation covers 3 classes of reclaimed water use for agricultural irrigation based on the types of crops and irrigation methods (in addition there are other classes for each type of use). The agricultural classes are similar to those set out in the proposal.   |
| 2c. Requirements for the reclaimed water for: Legionella, intestinal nematodes (helminth eggs), E.coli, BOD5, TSS, turbidity                        | <b>Different parameters are covered:</b><br>The national legislation sets out parameters very similar to those in the proposal (the exception being BOD5 which is not covered), and, like the proposal, differentiates the limits according to the classes of water use. However, in many cases, the proposal sets more stringent limits (e.g. for TSS and turbidity). Other parameters can be defined depending on the specific permit and water use and can cover e.g. Salmonella, heavy metals and COD. Overall, the national legislation requires the monitoring of a large number of parameters (72 parameters are monitored <sup>50</sup> ). |
| 2d. Monitoring requirements: from once a week to twice a month depending on the parameter and class of reclaimed water                              | <b>Different monitoring requirements:</b><br>The monitoring requirements are very similar, except the proposal requires less frequent monitoring for classes C and D. According to the national legislation, most parameters must be monitored once a week regardless of the class. However, the monitoring frequency can be reduced up to 50% after 1 year for those parameters not likely to be present. Conversely, it can be doubled if parameters are high.   |
| 2e. Validation monitoring: required before the reclamation plant is put into operation, upgraded or modified (relevant for food crops consumed raw) | <b>The proposal is more specific:</b><br>Provisions for validation monitoring were not identified in the Spanish legislation.  |
| 3. Water Reuse Risk Management Plan   | <b>The proposal is more specific:</b><br>Risk management measures are required as part of the documentation submitted by the applicant during the permitting process. The documentation describes the characteristics of the project (including the treatment used). However, no further requirements are set for risk management.   |
| 4. Information to the public  | <b>The proposal is more specific:</b><br>Provisions for information to the public were not identified in the Spanish legislation.  |

<sup>50</sup> JRC, 2014, Water Reuse in Europe, Relevant guidelines, needs for and barriers to innovation.

## 2.8 Malta

Malta is one of the European countries affected by water stress with a WEI of 48% (2015)<sup>51</sup>. Although the salinity of the effluents remains a problem<sup>52</sup>, the reuse rate of treated wastewater effluents in the country is high (around 60%)<sup>53</sup>. However, there are no legally binding standards or legislation concerning water reuse in Malta. Even though the desk research carried out under Part 1 indicated the Malta is considering the preparation of water reuse guidelines, the consequent targeted research did not find further details. According to a 2015 Commission study<sup>54</sup>, Malta is developing a National Water Management Plan that aims to address water scarcity through an integrated water management approach. The plan is expected to cover the use of polished treated effluents for different purposes, including artificial recharge of aquifers. Under the same framework, the country is considering new regulatory measures to guide the production and use of treated sewage effluents and the development of a publicly available information system on the quality of the treated effluent to increase the public acceptance. However, the targeted research undertaken by the country expert did not identify any further information, updates or draft content for these water reuse guidelines<sup>55</sup>.

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<sup>51</sup> Eurostat, 2018, Water Exploitation Index.

<sup>52</sup> BIO Deloitte, ICF GHK and Cranfield University, 2015, Optimising water reuse in the EU, Final report – Part I, Annex A and Annex E.

<sup>53</sup> SWD/2018/249 final/2.

<sup>54</sup> BIO Deloitte, ICF GHK and Cranfield University, 2015, Optimising water reuse in the EU, Final report – Part I, Annex A and Annex E.

<sup>55</sup> The sources surveyed in the targeted research for Malta include: the websites of the Ministry for Energy and Water Management (<https://energy.gov.mt/en/Pages/default.aspx>), the Regulator for Energy and Water Services (<https://www.rews.org.mt/#/en/home>), The Energy and Water Agency (<https://www.energywateragency.gov.mt/water/>) and the news.



## Part 3: Conclusions

Despite increasing levels of water stress across the EU and a large potential to reuse treated wastewater, the water reuse remains limited and unregulated in the different Member States. Currently only five countries have compulsory standards on water reuse enforced through specific water reuse legislation – Cyprus, France, Greece, Italy and Spain. Water reuse standards exist also in Portugal but they become binding only when included in water reuse permits. Even though indications of guidelines preparation were found for some other Member States (most notably Malta), the desk research carried out for this report did not find any evidence of further developments, existing drafts or news. It is possible that Member States, which had considered the development of standards or guidelines for water reuse, put off these plans in anticipation of the adoption of the Commission Regulation on water reuse.

The Commission proposal for a Regulation on water reuse (COM(2018) 337 final) aims to set minimum standards for reclaimed water used for agricultural irrigation. The standards concern six parameters differentiated for four water classes based on the crops and irrigation techniques. The proposal also defines requirements for a permitting system, validation monitoring, water reuse risk management plans and provision of information to the public. All six of the Member States with existing water reuse legislation, which were selected for review, have already set up competent authorities and permitting systems. However, unlike the Commission proposal the legislation in these countries covers a broader range of uses/sectors where reclaimed water can be reused. All countries except for Italy differentiate between several classes of reclaimed water used for agricultural irrigation based on crop types and sometimes irrigation technology (e.g. Spain and Greece) similarly to the proposal.

Furthermore, the types of parameters suggested in the Commission proposal are monitored only in Spain but only for certain uses, while in the other five countries only some of those parameters are controlled. Nonetheless, in all countries except for France, the existing water reuse legislation defines limit values for more than six parameters with some countries like Greece, Italy and Spain setting out limit values for over 50 parameters. However, monitoring a large number of different parameters can be burdensome and slow down the uptake of water reuse. In most countries, the monitoring requirements differ from those in the proposal as different monitoring frequencies are outlined. Moreover, in Italy the monitoring requirements are set at the regional rather than national level. Overall, the Commission proposal is similar to the Spanish legislation with e.g. similar parameters and classes of water use but less detailed in terms of quality requirements and monitoring. While in some Member States

the national legislation contains some relevant provisions on risk management at the permitting stage (e.g. France, Portugal and Spain) and provision of information to the public (e.g. France and Portugal), these requirements are less specific than those in the Commission proposal. In addition, none of the six countries reviewed defines relevant provisions for validation monitoring.

Therefore, in most of these six Member States reviewed the implementation of the EU Regulation on water reuse is likely to require modifications to the parameters and monitoring requirements in order to bring the national legislation in line with the EU rules. In most cases, the EU Regulation will introduce limit values for some microbiological parameters such as Legionella and intestinal nematodes (Helminth eggs) as well as more frequent monitoring for some water classes. In Italy, this would also necessitate the introduction of classes of reclaimed water for agricultural irrigation. However, the implementation of the provisions for validation monitoring, risk management plans and provision of information to the public is likely to require a substantial effort at the Member State level as the current legislative frameworks do not cover these issues. The following table provides a summary of the conclusions concerning the efforts required by the six Member States reviewed to implement the EU Regulation on water reuse.

**Table 8: Overview of the expected efforts required by selected Member States to implement the EU Regulation on water reuse**

| Provisions in the proposal              | Cyprus        | France        | Greece        | Italy         | Portugal      | Spain         |
|---|---------------|---------------|---------------|---------------|---------------|---------------|
| 1. Permits & competent authorities      | Minor changes | Minor changes | Minor changes | Minor changes | Minor changes | Minor changes |
| 2a.Use of reclaimed water               | No changes    | No changes    | No changes    | No changes    | No changes    | No changes    |
| 2b.Classes of reclaimed water           | Minor changes | Minor changes | Minor changes | Major changes | Minor changes | Minor changes |
| 2c.Requirements for the reclaimed water | Minor changes | Minor changes | Minor changes | Minor changes | Minor changes | Minor changes |
| 2d.Monitoring requirements              | Minor changes | Minor changes | Minor changes | Minor changes | Minor changes | Minor changes |
| 2e.Validation monitoring                | Major changes | Major changes | Major changes | Major changes | Major changes | Major changes |
| 3.Water Reuse Risk Management Plan      | Major changes | Major changes | Major changes | Major changes | Major changes | Major changes |
| 4. Information to the public            | Major changes | Major changes | Major changes | Major changes | Major changes | Major changes |

Notes: Green = no or minor changes required to the current legal framework as it already covers similar provisions as those in the Commission proposal.

Orange = major changes required to the current legal framework as it does not have relevant provisions as those in the Commission proposal.

# Annex 1: List of references

All weblinks provided below were accessible as of 24 September 2018.

- Amec Foster Wheeler Environment et al. 2016, EU-level instruments on water reuse, Final report to support the Commission's Impact Assessment, October 2016, available at: [http://ec.europa.eu/environment/water/blueprint/pdf/EU\\_level\\_instruments\\_on\\_water-2nd-IA\\_support-study\\_AMEC.pdf](http://ec.europa.eu/environment/water/blueprint/pdf/EU_level_instruments_on_water-2nd-IA_support-study_AMEC.pdf)
- BIO Deloitte, ICF GHK and Cranfield University, 2015, Optimising water reuse in the EU, Final report – Part I, Prepared for the European Commission – DG ENV, 15 March 2015, available at: [http://ec.europa.eu/environment/water/blueprint/pdf/BIO\\_IA%20on%20water%20reuse\\_Final%20Part%20I.pdf](http://ec.europa.eu/environment/water/blueprint/pdf/BIO_IA%20on%20water%20reuse_Final%20Part%20I.pdf)
- European Commission, 2018, Proposal for a *Regulation of the European Parliament and of the Council on minimum requirements for water reuse*, COM(2018) 337 Final, 2018/0169 (COD), Brussels, 28.5.2018, available at: [https://eur-lex.europa.eu/resource.html?uri=cellar:e8951067-627c-11e8-ab9c-01aa75ed71a1.0001.03/DOC\\_1&format=PDF](https://eur-lex.europa.eu/resource.html?uri=cellar:e8951067-627c-11e8-ab9c-01aa75ed71a1.0001.03/DOC_1&format=PDF)
- European Commission, 2018, Annexes to the Proposal for a *Regulation of the European Parliament and of the Council on minimum requirements for water reuse*, COM(2018) 337 final, 28.5.2018.
- European Commission, 2018, Commission staff working document, Executive Summary of the Impact Assessment, Accompanying the document *Proposal for a Regulation [...] on minimum requirements for water reuse*, SWD/2018/250 final, available at: <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52018SC0250&from=EN>
- European Commission, 2018, Commission staff working document, Impact Assessment, Accompanying the document *Proposal for a Regulation[...] on minimum requirements for water reuse*, SWD/2018/249 final/2, available at: [https://eur-lex.europa.eu/legal-content/EN/TXT/HTML/?uri=CELEX:52018SC0249\(01\)&qid=1532355252813&from=EN](https://eur-lex.europa.eu/legal-content/EN/TXT/HTML/?uri=CELEX:52018SC0249(01)&qid=1532355252813&from=EN)

- Eurostat, 2018, Water Exploitation Index: [https://ec.europa.eu/eurostat/tgm/table.do?tab=table&init=1&language=en&pcode=t2020\\_rd220&plugin=1](https://ec.europa.eu/eurostat/tgm/table.do?tab=table&init=1&language=en&pcode=t2020_rd220&plugin=1)
- Eurostat, 2018, Water use balance statistics, downloaded from: [http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=env\\_wat\\_bal&lang=en](http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=env_wat_bal&lang=en)
- JRC, 2014, Water Reuse in Europe, Relevant guidelines, needs for and barriers to innovation, A synoptic overview by Alcalde Sanz, L. and Gawlik B.M. available at: <http://publications.jrc.ec.europa.eu/repository/handle/JRC92582>
- TYPESA, 2013, Updated Report on Wastewater Reuse in the European Union, April 2013, available at: [http://ec.europa.eu/environment/water/blueprint/pdf/Final%20Report\\_Water%20Reuse\\_April%202013.pdf](http://ec.europa.eu/environment/water/blueprint/pdf/Final%20Report_Water%20Reuse_April%202013.pdf)

## Country sources:

### Cyprus:

- Law N.106(I)/2002 (amendments 2002-2009) concerning ‘The Control of the Waters Pollution’.
- Code of Good Agriculture Practice (regulation 407/2002).
- Regulation 269/2005 The Control of Water Pollution (General Terms of Waste Disposal from Urban Wastewater Treatment Plants) Decree of 2005, E.E. Par. III (1), no. 4000, p. 2338, 3/6/2005: [http://www.cylaw.org/KDP/data/2005\\_1\\_269.pdf](http://www.cylaw.org/KDP/data/2005_1_269.pdf)
- Regulation 772/2003 On the Control of Water Pollution (Urban Waste Disposal) Regulations 2003, E.E. Par. III (1), no. 3758, p. 4409, 3/10/2003: [http://www.cylaw.org/KDP/data/2003\\_1\\_772.pdf](http://www.cylaw.org/KDP/data/2003_1_772.pdf)

### Greece:

- Joint Ministerial Decree 145116/11 or CMD No 145116 Measures, limits and procedures for reuse of treated wastewater, Ministry of Environment, Energy and Climate Change Save water. A modern challenge in the face of climate change, found in: <http://www.ypeka.gr/LinkClick.aspx?fileticket=6JHn73G37JA%3D&tabid=247&language=el-GR>



France:

- Arrêté du 2 août 2010 relatif à l'utilisation d'eaux issues du traitement d'épuration des eaux résiduaires urbaines pour l'irrigation de cultures ou d'espaces verts, Modifié par ARRÊTÉ du 25 juin 2014: <https://www.legifrance.gouv.fr/affichTexte.do?cidTexte=JORFTEXT000022753522&dateTexte=20180914>

Italy:

- Legislative Decree 11 May 1999, n. 152, Environmental Code: <http://www.camera.it/parlam/leggi/deleghe/99152dl.htm>

Portugal:

- Guidelines of the National Regulator for water supply, wastewater and wastes services, (ERSAR), ERSAR Guidelines 14: Reuse of urban waste water: <http://www.ersar.pt/pt/publicacoes/publicacoes-tecnicas/guias#BookID=2197>

Spain:

- Royal Decree: Ministerio de Medio Ambiente, "Guía para la Aplicación del R.D. 1620/2007 por el que se establece el Régimen Jurídico de la Reutilización de las Aguas Depuradas": [https://www.mapama.gob.es/es/agua/temas/concesiones-y-autorizaciones/GUIA%20RD%201620\\_2007\\_tcm30-213764.pdf](https://www.mapama.gob.es/es/agua/temas/concesiones-y-autorizaciones/GUIA%20RD%201620_2007_tcm30-213764.pdf)



## Annex 2: Inventory of legislation on water reuse in the different Member States

| Member State | Water reuse legislation  | Guidelines   | Standards   | Other relevant measures or incentives  |
|--------------|--|--|---|--|
| AT           | No   | No   | No  | None identified  |
| BE           | No   | Proposal for guidelines on water quality in the Flemish region but there is no information about the progress so far <sup>56</sup> | No  | Water reuse measures for some RBMPs  |
| BG           | No   | Consideration of guidelines for the water reuse implementation but there is no information about the progress so far <sup>57</sup> | No  | Water reuse measures for some RBMPs  |
| CY           | Law N.106(I)/2002 (amendments 2002-2009) concerning 'The Control of the Waters Pollution' and associated regulations K.D.P. 407/2002, 772/2003, 254/2003 and 269/2005, K.D. 379/2015 | Code of Good Agriculture Practice (regulation K.D.P. 407/2002)   | Law 106 (I) 2002 and associated regulations K.D.P. 772/2003 and K.D.P. 269/2005 | Water reuse measures in the RBMP   |
| CZ           | No   | No   | No  | Water reuse measures for some RBMPs  |
| DE           | No   | No   | No  | Four regions provide subsidies for rainwater reuse and the building regulations include rainwater catchment with a fee for discharging it into the sewer <sup>58</sup> |
| DK           | No   | The Danish government issued guidelines on water use in food businesses in 2014 (Vejledning nr. 9236 af 29. april 2014 om          | No  | None identified  |

<sup>56</sup> BIO Deloitte, ICF GHK and Cranfield University, 2015, Optimising water reuse in the EU, Final report – Part I.

<sup>57</sup> TYPASA, 2013, Updated Report on Wastewater Reuse in the European Union.

<sup>58</sup> TYPASA, 2013, Updated Report on Wastewater Reuse in the European Union.

| Member State | Water reuse legislation  | Guidelines  | Standards   | Other relevant measures or incentives   |
|--------------|--|---|---|---|
|              |  | fødevarehygiejne, kap. 10 or 'Guidelines on hygiene') in order to provide clarity concerning the current water-related regulations that are considered as relatively complex <sup>59</sup>  |   |   |
| EE           | No   | No  | No  | None identified   |
| EL           | Joint Ministerial Decree 145116/11 or CMD No 145116 Measures, limits and procedures for reuse of treated wastewater  | Joint Ministerial Decree 145116/11  | Joint Ministerial Decree 145116/11  | None identified   |
| ES           | Royal Decree 1620/2007: The legal framework for the reuse of treated wastewater  | Royal Decree 1620/2007  | Royal Decree 1620/2007  | Water reuse measures for some RBMPs   |
| FI           | No   | No  | No  | None identified   |
| FR           | Decree from 2 August 2010 related to the use of water from treated urban wastewater for irrigation of crops and green areas (amended in 2014 - JORF num.0153 of 4 July 2014) | Health Guidelines for reuse, after treatment, of wastewater for crop and green spaces irrigation (CSHPF, 1991); Technical recommendations about the wastewater treatments necessary to ensure compliance with the French Guidelines published by the Association of Water Supply and Sewerage Practitioners (AGHTM, 1996) | Decree from 2 August 2010 related to the use of water from treated urban wastewater for irrigation of crops and green areas | Financial incentives are available from the Catchment Authorities for reuse projects in industry <sup>60</sup> ; Water reuse measures are also included in some RBMPs |
| HR           | No   | No  | No  | None identified   |
| HU           | No   | No  | No  | The Environmental Programme and the RBMP promote the local reuse of treated wastewater for irrigation where lands are affected by water scarcity <sup>61</sup>        |

<sup>59</sup> BIO Deloitte, ICF GHK and Cranfield University, 2015, Optimising water reuse in the EU, Final report – Part I.

<sup>60</sup> TYPASA, 2013, Updated Report on Wastewater Reuse in the European Union.

<sup>61</sup> TYPASA, 2013, Updated Report on Wastewater Reuse in the European Union.

| Member State | Water reuse legislation                                    | Guidelines  | Standards  | Other relevant measures or incentives   |
|--------------|--|---|--|---|
| IE           | No   | No  | No   | None identified   |
| IT           | Decree 11 May 1999, n. 152, Environmental Code             | Decree of Environmental Ministry 185/2003 (DM 185/2003) Technical measures for reuse of Wastewater  | Decree 11 May 1999, n. 152, Environmental Code             | Water reuse measures for some RBMPs   |
| LT           | No   | No  | No   | None identified   |
| LU           | No   | No  | No   | None identified   |
| LV           | No   | No  | No   | None identified   |
| MT           | No   | Guidelines on water reuse, including quality standards and a publicly available information system on the quality of the treated effluent are under preparation <sup>62</sup> | No   | Water reuse measures in the RBMP  |
| NL           | No   | No  | No   | Taxes and limits on aquifer abstraction make industrial wastewater reuse attractive <sup>63</sup>   |
| PL           | No   | No  | No   | None identified   |
| PT           | NP 4434 2005 Reuse of reclaimed urban water for Irrigation | Guidelines of the National Regulator for water supply, wastewater and wastes services, (ERSAR): ERSAR Technical guide No14 for water reuse, 2010                              | NP 4434 2005 Reuse of reclaimed urban water for Irrigation | Water reuse measures for some RBMPs   |
| RO           | No   | No  | No   | Indirectly water reuse is covered by Government Decision no. 188/20.03.2002 approving norms for discharging into aquatic environment of used waters and Law no. 241/2006 regarding the water supply and sewage services <sup>64</sup> |
| SE           | No   | No  | No   | None identified   |
| SI           | No   | No  | No   | None identified   |

<sup>62</sup> BIO Deloitte, ICF GHK and Cranfield University, 2015, Optimising water reuse in the EU, Final report – Part I.

<sup>63</sup> TYPASA, 2013, Updated Report on Wastewater Reuse in the European Union.

<sup>64</sup> Amec Foster Wheeler Environment et al. 2016, EU-level instruments on water reuse, Final report to support the Commission's Impact Assessment.

| Member State | Water reuse legislation | Guidelines | Standards | Other relevant measures or incentives   |
|--------------|-------------------------|------------|-----------|---|
| SK           | No                      | No         | No        | None identified   |
| UK           | No                      | No         | No        | Water reuse with membranes is part of the Enhanced Capital Allowances (ECA) scheme that provides financial incentives for the industry to reuse wastewater through tax incentives <sup>65</sup> |

**Sources:** TYP SA, 2013, Updated Report on Wastewater Reuse in the European Union;  
JRC, 2014, Water Reuse in Europe, Relevant guidelines, needs for and barriers to innovation;  
BIO Deloitte, ICF GHK and Cranfield University, 2015, Optimising water reuse in the EU, Final report – Part I;  
Amec Foster Wheeler Environment et al. 2016, EU-level instruments on water reuse, Final report to support the Commission’s Impact Assessment;  
Information reported by the Member States to the EIONET Central Data Repository (CDR) concerning the implementation of the Water Framework Directive (2000/60/EC).  
**Notes:** RBMP = River Basin Management Plan.

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<sup>65</sup> TYP SA, 2013, Updated Report on Wastewater Reuse in the European Union.

# Annex 3: Information sheets for the Commission proposal and selected Member State legislation Commission proposal

## Information sheet: Commission proposal for a Regulation on water reuse (COM(2018) 337 final)

### 1. Permits & competent authorities

Article 3(1) defines 'competent authority' as an authority or body designated by a Member State to carry out obligations arising from this Regulation. The competent authority is responsible for permitting the supply of reclaimed water as well as ensuring compliance with the conditions set out in the permit.

Articles 6 and 7 define the permitting provisions: Any supply of reclaimed water destined for agricultural irrigation is subject to a permit. The operator shall submit an application for a permit or a modification of an existing permit to the competent authority, including (a) a Water Reuse Risk Management Plan drawn up in accordance with Article 5(2); (b) a description of how the reclamation plant operator will comply with the minimum requirements for water quality and monitoring set out in section 2 of Annex I; and (c) a description of how the reclamation plant operator will comply with the additional requirements proposed in the Water Reuse Risk Management Plan. The competent authority shall, if appropriate consult and exchange relevant information with other relevant authorities, in particular the water authority, before granting the permit. Where the competent authority decides to grant a permit, it shall determine the conditions applicable, including the following (as applicable): (a) conditions in relation to the minimum requirements for water quality and monitoring set out in section 2 of Annex I; (b) conditions in relation to the additional requirements proposed in the Water Reuse Risk Management Plan; (c) any other conditions necessary to further mitigate any unacceptable risks to the human and animal health or the environment. Permits need to be reviewed regularly, at least every five years and, if necessary, modified.

Article 8 defines the compliance checks: Competent authorities are obliged to check whether reclaimed water meets the conditions set out in the permit through (a) on-spot checks; (b) use of monitoring data obtained under this Regulation, the UWWTD (91/271/EEC) and the WFD (2000/60/EC); (c) any other adequate means. In the event of non-compliance, the competent authority is required to instruct the reclamation plant operator to take any necessary measures to restore compliance without delay. In cases of a significant risk to the environment or to human health, the reclamation plant operator needs to immediately suspend any further supply of the reclaimed water until the competent authority determines that compliance has been restored. If an incident affecting compliance with the permit's conditions occurs, the reclamation plant operator shall immediately inform the competent authority and the end-user(s) which may be potentially affected, and communicate to the competent authority the information necessary for assessing the impacts of such an incident.

In addition, Member States need to appoint a national contact point to cooperate as appropriate with other Member States (Article 9).

### 2a. Use of reclaimed water

Section 1 of Annex I specifies the application of the proposed Regulation to reclaimed water intended for specific uses, specifically the irrigation of:

- food crops consumed raw, meaning crops which are intended for human consumption to be eaten raw or unprocessed;
- processed food crops, meaning crops which are intended for human consumption not to be eaten raw but after a treatment process (i.e. cooked, industrially processed);
- non-food crops, meaning crops which are not intended for human consumption (e.g. pastures, forage, fiber, ornamental, seed, energy and turf crops).

**Information sheet: Commission proposal for a Regulation on water reuse (COM(2018) 337 final)**

**2b.Classes of reclaimed water**

Four classes of reclaimed water quality (A, B, C, and D) and corresponding allowed uses and irrigation methods are detailed in Annex I, Section 2.1, Table 1.

|                           | <b>Class A</b>   | <b>Class B</b>  | <b>Class C</b>  | <b>Class D</b>                       |
|---------------------------|--|---|---|--------------------------------------|
| <b>Crop category:</b>     | All food crops, including root crops consumed raw and food crops where the edible part is in direct contact with reclaimed water | Food crops consumed raw where the edible part is produced above ground and is not in direct contact with reclaimed water, processed food crops and non-food crops including crops to feed milk- or meat-producing animals | Food crops consumed raw where the edible part is produced above ground and is not in direct contact with reclaimed water, processed food crops and non-food crops including crops to feed milk- or meat-producing animals | Industrial, energy, and seeded crops |
| <b>Irrigation method:</b> | All irrigation methods   | All irrigation methods  | Drip irrigation only  | All irrigation methods               |

**2c.Requirements for the reclaimed water**

Applies to all classes (Annex I, Section 2.1):

The reclaimed water will be considered compliant with the requirements set out in Table 2 if the measurements meet all of the following criteria:

- The indicated values for E. coli, Legionella spp and Intestinal nematodes are met in 90 % or more of the samples. None of the values of the samples can exceed the maximum deviation limit of 1 log unit from the indicated value for E. coli and Legionella and 100 % of the indicated value for intestinal nematodes.
- The indicated values for BOD5, TSS, and turbidity in Class A are met in 90 % or more of the samples. None of the values of the samples can exceed the maximum deviation limit of 100% of the indicated value.

Quality requirements applicable to all classes (Annex I, Section 2.1 (a), Table 2):

**Legionella** spp.: <1,000 cfu/l where there is risk of aerosolization in greenhouses;

**Intestinal nematodes (helminth eggs):** ≤1 egg/l for irrigation of pastures or forage.

Class-specific requirements BOD5, TSS and Turbidity are laid out in Annex I, Section 2.1 (a), Table 2.

|                                     | <b>Class A</b>                                    | <b>Class B</b>                             | <b>Class C</b>                             | <b>Class D</b>                             |
|-------------------------------------|---|--|--|--|
| <b>Indicative technology target</b> | Secondary treatment, filtration, and disinfection | Secondary treatment, and disinfection      | Secondary treatment, and disinfection      | Secondary treatment, and disinfection      |
| <b>E. coli (cfu/100ml)</b>          | ≤10 or below LOD                                  | ≤100                                       | ≤1,000                                     | ≤10,000                                    |
| <b>BOD5 (mg/l)</b>                  | ≤10   | ≤25 (according to UWWTD, Annex I, Table 1) | ≤25 (according to UWWTD, Annex I, Table 1) | ≤25 (according to UWWTD, Annex I, Table 1) |
| <b>TSS (mg/l)</b>                   | ≤10   | ≤35 (according to UWWTD, Annex I, Table 1) | ≤35 (according to UWWTD, Annex I, Table 1) | ≤35 (according to UWWTD, Annex I, Table 1) |
| <b>Turbidity (NTU)</b>              | ≤5  | --   | --   | --   |

**2d.Monitoring requirements**

Reclamation plant operators shall perform routine monitoring to verify that the reclaimed water is complying with the minimum water quality requirements set out in point (a). The routine monitoring shall be included in the verification procedures of the water reuse system (Annex I, Section 2(b)).



**Information sheet: Commission proposal for a Regulation on water reuse (COM(2018) 337 final)**

Monitoring requirements applicable to all classes (Annex 1, Section 2.1(b), Table 3):

- Legionella (when applicable): Once a week.
- Intestinal nematodes (helminth eggs) (when applicable): Twice a month or frequency determined by the reclamation plant operator according to the number of eggs in waste water entering the reclamation plant.

Class-specific requirements on E.coli, BOD5, TSS and Turbidity are laid out in Annex I, Section 2.1(b), Table 3.

|              | <b>Class A</b> | <b>Class B</b>  | <b>Class C</b>  | <b>Class D</b>  |
|--------------|----------------|---|---|---|
| E.coli       | Once/week      | Once/week   | Twice/month   | Twice/month   |
| BOD5 and TSS | Once/week      | Once or twice per month depending on the size of the treatment plant (According to Directive 91/271/EEC - Annex I, Section D) | Once or twice per month depending on the size of the treatment plant (According to Directive 91/271/EEC - Annex I, Section D) | Once or twice per month depending on the size of the treatment plant (According to Directive 91/271/EEC - Annex I, Section D) |
| Turbidity:   | Continuous     | --  | --  | --  |

**2e. Validation monitoring**

Validation monitoring has to be performed before the reclamation plant is put into operation, when equipment is upgraded, and when new equipment or processes are added. It shall be performed for Class A, the most stringent reclaimed water quality class. Validation monitoring entails the monitoring of the indicator microorganisms associated to each group of pathogens (bacteria, virus and protozoa). Performance targets shall be met at the outlet of the reclamation plant (point of compliance), considering the concentrations of the raw waste water effluent entering the urban waste water treatment plant.

Performance targets for the treatment chain (log10 reduction) per indicator microorganism are described for **class A** (most stringent class) in Annex 1, Section 2.1(b), Table 4 :

- E.coli:  $\geq 5.0$ .
- Total coliphages/ F-specific coliphages/somaticcoliphages/coliphages:  $\geq 6.0$ . If analysis of total coliphages is not feasible, at least one of them (F-specific or somatic coliphages) has to be analyzed.
- Clostridium perfringens spores/spore-forming sulfate-reducing bacteria:  $\geq 5.0$ . Spore-forming sulfate-reducing bacteria is an alternative if the concentration of Clostridium perfringens spores does not allow to validate the requested log10 removal.
- Possible alternative reference pathogens and performance targets:
  - Campylobacter:  $\geq 5.0$
  - Rotavirus:  $\geq 6.0$
  - Cryptosporidium:  $\geq 5.0$

**3. Water Reuse Risk Management Plan**

Article 5 requires the reclamation plant operator to draw-up a Water Reuse Risk Management Plan in cooperation with relevant parties (the end-user of the reclaimed water, the urban waste water treatment plant supplying water to the reclamation plant, etc.). The Risk Management Plan needs to be based on the following key risk management tasks set out in Annex II.

1. Describe the water reuse system, from the waste water entering the urban waste water treatment plant to the point of use.
2. Identify potential hazards, in particular the presence of pollutants and pathogens, and the potential for hazardous events such as treatment failures, accidental leakages or contamination in the described water reuse system.

### Information sheet: Commission proposal for a Regulation on water reuse (COM(2018) 337 final)

3. Identify the environments, populations and individuals at risk of direct or indirect exposure to the identified potential hazards.
4. Conduct a risk assessment covering both environmental risks and risks to human and animal health.
5. When necessary and appropriate to ensure sufficient protection of the environment and human health, specify requirements for water quality and monitoring that are additional to and/or stricter than those specified in Annex I.
6. Identify preventive measures that are already in place or that should be taken to limit risks so that all identified risks can be adequately managed (Specific preventive measures that may be relevant are set out in Table 1).
7. Ensure that adequate quality control systems and procedures are in place.
8. Ensure that environmental monitoring systems are in place that will detect any negative effects of the water reuse.
9. Ensure that an appropriate system is in place to manage incidents and emergencies.

#### 4. Information to the public

According to Article 10 Member States are required to ensure that adequate and up-to-date information on reuse of water is available online to the public. The provision lists the following pieces of information to be provided to the public which need to be updated at least once a year:

- (a) the quantity and the quality of the reclaimed water supplied in accordance with this Regulation.
- (b) the percentage of the reclaimed water in the Member State supplied in accordance with this Regulation compared to the total amount of treated urban waste water.
- (c) permits granted or modified in accordance with this Regulation, including conditions set by competent authorities.
- (d) outcome of the compliance check performed in accordance with Article 8(1).
- (e) contact points designated in accordance with Article 9(1).

In addition, Article 12 requires Member States to ensure that citizens and NGOs have access to a review procedure before a court of law or another independent and impartial body established by law to review the decisions taken by Member States under this regulation. This Article is in line in line with Article 47 of the Charter of Fundamental Rights and implements the Aarhus Convention with regard to access to justice.

Sources: COM(2018) 337 final; COM(2018) 337 final: Annexes; and UWWTD (Directive 91/271/EEC).

## Cyprus

### Information sheet: Cyprus

#### 1. Permits & competent authorities

According to section 3 of Law N.106(I)/2002, the Minister of Agriculture, Rural Development and Environment is the competent authority designated to carry out obligations arising from this law. The Minister shall take appropriate action and the necessary measures to ensure that all provisions of the Law are applied correctly and effectively.

Permitting: Article 8 prohibits the operation of any installation which causes or is likely to cause pollution to waters or the soil unless the operator of the facility holds a discharge permit in accordance with the provisions of this Law. A permit cannot be granted or renewed unless the installation has: (a) in the case of an existing installation, a valid land planning permit and/ or building permit and/ or certificate of approval; and (b) in the case of a new installation, an approval certificate.

For the purposes of the effective implementation of the provisions of this Law and of any applicable Regulations or decrees, the Minister may appoint a Chief Inspector who acts under his supervision and instructions, as well as other officers of his Ministry as Inspectors acting under the supervision and instructions of the Chief Inspector. In carrying out his duties, the Inspector may, pursuant to Article 24, enter any premises of facilities in which there is or is reasonable cause to believe that there is a breach

of the law; carry out the tests or measurements it deems necessary for the performance of his duties; inspect, examine and control the operation of any machinery, equipment or equipment in the premises of the installation and make filming or photographing if it deems it necessary; require the presentation and inspection of any books or documents relating to or relating to the installation which they consider to contain information useful for the purpose of investigating any matter relating to the installation; require that any machinery, apparatus, equipment or substance contained therein, remain in the premises as it is for as long as it considers reasonably necessary for investigation purposes. If the Inspector has reasonable cause to believe that an operation creates a risk of environmental pollution due to a possible fire, explosion or discharge of any substance or waste, it shall have the power to impose on the operator instructions on risk eradication or mitigation measures within a specific period of time and terminate the permit of the operation if the risk persists.

#### **2a. Use of reclaimed water**

The Cypriot legislation and particularly the Code of Good Agricultural Practice includes guidelines for agricultural activities in order to prevent and reduce water pollution. The Code further provides specific environmental requirements for the reuse of urban waste water for irrigation in such activities. These activities include irrigation of landscape, food and non-food crops and aquifers. The reuse of water is not allowed for industry and urban purposes.

As pointed out by the BIO Deloitte, ICF GHK and Cranfield University (2015) study, irrigation of leafy vegetables, bulbs or tubers that are eaten raw is forbidden.

#### **2b. Classes of reclaimed water**

The uses of reclaimed water for irrigation purposes in agriculture refers to the following categories introduced by law:

- a) grass and green areas with free use by the public,
- b) grass, green areas with limited use and for industrial and forage plants,
- c) vineyards,
- d) trees,
- e) vegetables.

#### **2c. Requirements for the reclaimed water**

The requirements for the reclaimed water include several microbiological and physical-chemical parameters including some covered in the Commission proposal and some additional ones such as (but not limited to) Chemical oxygen demand (COD), pH, electrical conductivity (EC), chlorine, nitrogen and phosphorus. Quality requirements for the parameters common with the EU proposal:

**E. coli (cfu/100ml):** 5-10,

**Helminth eggs (Intestinal nematodes) (eggs/l):** 0,

**TSS (mg/l):** 10-30,

**BOD5 (mg/l):** 10-70.

#### **2d. Monitoring requirements**

The legislation sets minimum monitoring requirements for the analysis of the parameters in question. The frequency of the monitoring carried out varies. The monitoring for the parameters common with the EU proposal are:

E. coli: 1/15 days,

Helminth eggs (Intestinal nematodes): 4/year,

TSS: 1/15 days,

BOD5: 1/15 days.

#### **2e. Validation monitoring**

Provisions regarding validation monitoring were not identified in the Cypriot legislation

#### **3. Water Reuse Risk Management Plan**

Provisions regarding risk management plans were not identified in the Cypriot legislation.

#### **4. Information to the public**

Provisions regarding information provided to the public were not identified in the Cypriot legislation.

Sources: Law N.106(I)/2002 (amendments 2002-2009) concerning 'The Control of the Waters Pollution'; Regulation 269/2005; Regulation 772/2003; Code of Good Agriculture Practice (regulation 407/2002); JRC, 2014, Water Reuse in Europe, Relevant guidelines, needs for and barriers to innovation; and BIO Deloitte, ICF GHK and Cranfield University, 2015, Optimising water reuse in the EU, Final report – Part I.

# Greece

## Information sheet: Greece

### 1. Permits & competent authorities

The competent authority for the coordination and implementation for the use of reclaimed water is the Decentralized Directorate of Water Management.

**Permitting:** The reuse of treated waste water for the uses and activities such as agricultural irrigation, the supply of underground aquifers, for urban and suburban use or industrial use shall require authorization. The permit for the reuse of liquid waste water is issued by the Secretary General of the Decentralized Administration, following the recommendation of the Decentralized Directorate of Water Management and the opinion of the competent departments. For the permit for the reuse of liquid waste water, a request from the user or the Recovery Water Management Authority is required to the relevant Department of Water of the Decentralized Administration. This application shall be accompanied by a study of the design and operation of the activity, which shall comply with the environmental conditions adopted by law. When assessing the application, the Directorate of Waters of the Decentralized Management examines the compatibility of the proposed use with the approved Program of Measures within the framework of the achievement of the environmental objectives. In this context, taking into account the particular circumstances of the area. Additional information may be requested in order to ensure the protection of the aquatic recipient.

**Compliance:** According to Article 13 of the Joint Ministerial Decree 145116/11, the Decentralized Directorate of Water Management in cooperation with the relevant departments performs regular and emergency checks in order to verify compliance with the terms and conditions requirements laid down in the permit for reuse of treated waste water.

A violation of the water reuse legislation by an act or omission of a natural or legal person incurs a penalty. Likewise, an activity that causes damage or direct threat of damage to water bodies against infringement of the provisions of this Decision, bears environmental liability.

### 2a. Use of reclaimed water

The use of reclaimed water is specified in Joint Ministerial Decree 145116/11:

- Agricultural irrigation (Article 4) including firstly limited irrigation, which applies only to crops whose products are consumed after heat or other treatment or are not intended for human consumption or do not come into direct contact with the soil, and secondly unrestricted irrigation, which applies inter alia to all other types of crops such as vegetables, vines or crops whose products are consumed raw, flowering.
- Enrichment of underground aquifers (Article 5).
- Reuse of treated liquid waste water for urban and peri-urban activities (Article 6) including urban and suburban green, forest lands, recreation, restoration, natural environment, fire-fighting, cleaning roads, except for drinking, bathing and domestic activities.
- Reuse of liquid waste water in the industry (Article 7) includes applications such as water use cooling, recharging boiler water and utilizing for the various industrial processes. The above reuse does not apply to the beverages intended for human consumption.

### 2b. Classes of reclaimed water

Three categories of reclaimed water quality and corresponding allowed uses and irrigation methods are detailed in Annex 1, Table 1, Table 2 and Table 3:

#### Category A : Limited Irrigation

**Agricultural use:** Areas where public access is not expected, feed crops, industrial crops, meadows, trees (excluding fruit), provided that the harvest is not in contact with the soil, seed crops and crops producing products processed further before consumption. Irrigation will not apply.

**Industrial use:** Disinfection, Disposable cooling water.

**Residual chlorine:** continuously (if chlorination is applied).

**Feeding of underground aquifers** not falling under Article 7 of Presidential Decree 51 / 2-3-2007, (without prejudice to Article 5, paragraphs 4 and 5), by filtration through a soil layer of sufficient thickness and suitable features.

### **Category B: Unlimited irrigation**

Agricultural use: All crops such as vegetables, vines or crops whose products are consumed raw, greenhouses. Unlimited irrigation allows the application of various methods of irrigation.

Industrial use: of non-recirculating cooling water for re-circulating cooling water, boiler water, process water etc.

Another category C also existing concerning the urban and recreational uses of reclaimed water.

### **2c. Requirements for the reclaimed water**

The Annexes of the Joint Ministerial Decree 145116/11 include tables setting the maximum permitted levels; and restrictions on the various applications of retreatment of waste water.

**Category A:** Limits for microbiological and conventional parameters as well as the minimum required treatment, frequency of sampling and analysis in the case of reuse of treated liquid wastewater for limited irrigation, industrial use and underground enrichment aquifer, not used for drinking and by filtration through a suitable soil layer. Quality requirements for the parameters common with the EU proposal:

- **E. coli (cfu/100ml):** ≤ 200
- **BOD5 (mg/l):** ≤ 25mg
- **TSS (mg/l):** ≤ 10
- **Turbidity (NTU):** --

**Category B:** Microbiological parameters as well as the minimum required treatment, frequency of sampling and analysis in the case of re-use of treated liquids wastes for unlimited irrigation and industrial use other than disposable cooling water. Quality requirements:

- **E. coli (cfu/100ml):** ≤ 5 for 80% of the samples and ≤ 50 for 95% of the samples
- **BOD5 (mg/l):** ≤ 10 for 80% of the samples
- **TSS (mg/l):** ≤ 10 for 80% of the samples
- **Turbidity (NTU):** ≤ 2 median

### **2d. Monitoring requirements**

For the three water classes, inspections vary from 1-2 times per week to every 1-2 weeks depending on the materials tested. Other requirements for monitoring have not been identified except those referring to general urban waste management.

**Category A:** The monitoring for the parameters common with the EU proposal are:

- E. coli (cfu/100ml): 4 times per week
- BOD5 (mg/l): twice per month
- TSS (mg/l): twice per month
- Turbidity (NTU): 4 times per week.

**Category B:** The monitoring for the parameters common with the EU proposal are:

- E. coli (cfu/100ml): twice per week
- BOD5 (mg/l): once per month
- TSS (mg/l): once per month
- Turbidity (NTU): twice per week.

### **2e. Validation monitoring**

A provision regarding validation monitoring in the sense of the EU proposal was not identified in the Greek Legislation. However, there are provisions that prior to the issue of the reuse permit, the Directorate of Waters of the Decentralized Administration and the other competent authorities shall carry out a relevant inspection to determine that the organization, construction and operation of this installation are consistent with the submitted study and are compatible with any approved environmental conditions of the particular activity.

### **3. Water Reuse Risk Management Plan**

Provisions regarding risk management plans were not identified in the Greek legislation.

### **4. Information to the public**

Provisions regarding information provided to the public were not identified in the Greek legislation.

Sources: Joint Ministerial Decree 145116/11 or CMD No 145116 Measures, limits and procedures for reuse of treated wastewater; and JRC, 2014, Water Reuse in Europe, Relevant guidelines, needs for and barriers to innovation.

# France

## Information sheet: France

### 1. Permits & competent authorities

Article 12<sup>66</sup> refers to the operator of irrigated land who keeps a register that must be available to the municipality, the sanitary authority, the water police services, the inspectors in charge of plants protection and the operator of the waste water treatment plant.

Article 7 states that anyone who would like to use reclaimed water for irrigation should ask for an authorisation from the *department prefect*. This person can be the owner or the operator of the waste water treatment plant, of the irrigation system or of the parcels of land to be irrigated.

The request for a permit is mentioned in Article 7 and Annex IV and it should include:

1. Letter from the petitioner
2. A brief technical and non-technical summary
3. Information about the wastewater treatment plant (location, type of network, characteristics of waste water, processes in place, information about the receiving environment, monitoring of the performance, information about sludge etc.)
4. Detailed description of the reuse project (maps and urbanistic information, local meteorological information, detailed description of complementary treatment, information about the storage of reclaimed water if applicable, information about the parcels of land to be irrigated, frequency of irrigation, information about the discharge of treated water if not used, map of the project, measures about public information including onsite information, monitoring programme...)
5. Characteristics of the irrigation network and technologies
6. Description of the initial status of the receiving environment
7. Analysis of risks
8. Analysis of environmental and health impacts of the water reuse
9. Draft of agreement between the water treatment plant owner, the operator and the owners or operators of irrigated parcels."

The permit authorises the use of treated water after consultation of the department environmental council. It includes:

1. The origin and quality of treated water
2. The irrigation programme
3. The monitoring programme of treated water
4. The monitoring programme of soils
5. The daily discharge or volumes
6. Distance to be respected towards other activities / uses
7. Measures related to public information
8. Identity of owner or operators of water treatment plants, owner or operator of the irrigation system and operator of the irrigated parcels.

### 2a. Use of reclaimed water

Article 1 specifies the uses of reclaimed water:

Watering/spraying or irrigation, for agronomic or agricultural purposes, of crops, green spaces or forests. Article 2 provides more details about these uses (it provides detailed definitions for watering/spraying and irrigation).

As pointed out by the Amec Foster Wheeler Environment (2016) study irrigation with raw sludge or sludge that does not meet the limit values for agricultural use or with wastewater from WWTPs connected to certain animal by-products processing; and irrigation with treated wastewater on soils that do not meet the limit values for agricultural use of sewage sludge or within close protection perimeters of drinking water abstraction points are forbidden.

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<sup>66</sup> Decree from 2 August 2010 related to the use of water from treated urban wastewater for irrigation of crops and green areas (amended in 2014 by Decree 25/06/2014- JORF num.0153 of 4 July 2014).

## 2b.Classes of reclaimed water

### Class A:

- Fruits and vegetables crops non-modified by an appropriate industrial heating treatment (except watercress crops - water reuse prohibited for watercress) i.e. raw
- Fruits and vegetables crops modified by an appropriate industrial heating treatment
- Pasture (animals out of fields when spraying)
- Public open green spaces (spraying out of opening hours and access prohibited two hours after spraying)
- Cut flowers
- Plant nurseries, shrubs and other flower crops
- Fresh fodder
- Other cereal and fodder crops
- Fruit arboriculture
- Short or very short rotation coppice with limited public access.

### Class B:

- Fruits and vegetables crops modified by an appropriate industrial heating treatment
- Pasture (10 days after spraying with no reducing agent, 21 days otherwise)
- Cut flowers (only local irrigation)
- Plant nurseries, shrubs and other flower crops
- Fresh fodder (10 days after spraying if no reductor linked to the water treatment plant, 21 days otherwise)
- Other cereal and fodder crops
- Fruit arboriculture (prohibited during season from blossoming until harvesting for non-modified fruits)
- Short or very short rotation coppice with limited public access.

### Class C:

- Plant nurseries, shrubs and other flower crops (only local irrigation)
- Other cereal and fodder crops (only local irrigation)
- Fruit arboriculture (only drip irrigation)
- Short or very short rotation coppice with limited public access (only local irrigation).

### Class D:

- Short or very short rotation coppice with limited public access (only local irrigation).

## 2c.Requirements for the reclaimed water

The requirements for the classes of reused water quality (A, B, C, and D) are detailed in Annex II of the Decree 02/08/2010 (amended by Decree 25/06/2014). Limit values are defined for six parameters, only three of which are covered by the Commission proposal:

### Class A:

**Turbidity (mg/L):** <15

**BOD (mg/L):** <60

**E. coli (cfu/100ml):** ≤250

Additionally: Faecal Enterococcus (log reduction): ≥ 4

ARN-F specific Bacteriophage (log reduction): ≥ 4

Spores of anaerobic sulfate-reducing microorganisms (log reduction): ≥ 4

### Class B:

**Turbidity (mg/L):** in compliance with standards for treated water during non-irrigation season

**BOD (mg/L):** no parameter

**E. coli (cfu/100ml):** ≤ 10 000

Additionally: Faecal Enterococcus (log reduction): ≥ 3

ARN-F specific Bacteriophage (log reduction): ≥ 3

Spores of anaerobic sulfate-reducing microorganisms (log reduction): ≥ 3

### Class C:

**Turbidity (mg/L):** in compliance with standards for treated water during non-irrigation season

**BOD (mg/L):** no parameter

**E. coli (cfu/100ml):** ≤ 100 000

Additionally: Faecal Enterococcus (log reduction): ≥ 2

ARN-F specific Bacteriophage (log reduction): ≥ 2

Spores of anaerobic sulfate-reducing microorganisms (log reduction): ≥ 2

**Class D:**

**Turbidity (mg/L):** in compliance with standards for treated water during non-irrigation season

**BOD (mg/L):** no parameter

**E. coli (cfu/100ml):** no parameter

Additionally: Faecal Enterococcus (log reduction):  $\geq 2$

ARN-F specific Bacteriophage (log reduction):  $\geq 2$

Spores of anaerobic sulfate-reducing microorganisms (log reduction):  $\geq 2$

**2d. Monitoring requirements**

The monitoring programme is detailed in Article 10. This programme should include:

1. A periodic check of the quality level of the treated water, every 2 years. All the parameters in Annex II are monitored at the outlet of the wastewater treatment plant or complementary treatment.
2. A routine check during irrigation season of turbidity, BOD, E.Coli with frequencies detailed in Annex V (cf. below).
3. A monitoring of the quality of sewage sludge.

All analyses must be performed by an authorised laboratory (standard ISO/ CEI 17025).

Article 11 refers to the monitoring programme of soil. Every 10 years an analysis of the soil must be performed.

The monitoring requirements are as follows:

**Class A:**

Turbidity (mg/L): once per week

BOD (mg/L): once per week

E.Coli (UFC/100ml): once per week

Faecal Enterococcus: once a week

ARN-F specific Bacteriophage: once a week

Spores of anaerobic sulfate-reducing microorganisms: once a week

**Class B:**

Turbidity (mg/L): once every two weeks

BOD (mg/L): once every two weeks

E.Coli (UFC/100ml): once every two weeks

Faecal Enterococcus: once every two weeks

ARN-F specific Bacteriophage: once every two weeks

Spores of anaerobic sulfate-reducing microorganisms: once every two weeks

**Class C:**

Turbidity (mg/L): once per month

E.Coli (UFC/100ml): once a month

Faecal Enterococcus: once a month

ARN-F specific Bacteriophage: once a month

Spores of anaerobic sulfate-reducing microorganisms: once a month

**2e. Validation monitoring**

Decree 02/08/2010 (amended by Decree 25/06/2014) does not have information on "validation monitoring".

**3. Water Reuse Risk Management Plan**

Decree 02/08/2010 (corrected by Decree 25/06/2014) does not refer to a "Risk Management Plan". However, an analysis of risks must be performed as part of the request for authorisation (Annex IV and Article 7). The analysis of risk is defined as: description of the detection and management of malfunctions of the treatment and distribution networks.

**4. Information to the public**

Article 4 of Decree 02/08/2010 (amended by Decree 25/06/2014) includes specific provisions related to public information in green spaces. Information boards must be placed at the entrance of green spaces. They must indicate that treated water is used and recommend hygienic practices, and prohibit the access until two hours after irrigation.

Article 8 states that the authorisation delivered by the prefect should include measures for public information (point 7).

Sources: Decree from 2 August 2010 related to the use of water from treated urban wastewater for irrigation of crops and green areas (amended in 2014 by Decree 25/06/2014- JORF num.0153 of 4 July 2014); JRC, 2014, Water Reuse in Europe, Relevant guidelines, needs for and barriers to innovation; and Amec Foster Wheeler Environment et al. 2016, EU-level instruments on water reuse, Final report to support the Commission's Impact Assessment.



# Italy

## Information sheet: Italy

### 1. Permits & competent authorities

Article 6<sup>67</sup> states that the authorisation for the use of reclaimed water shall outline the rules to be followed to ensure that the treatment plant discharging water observes the limit values and the requirements of the decree. The authorisation regime is regulated by regional law in Italy. It is generally the province that release the authorisation.

### 2a. Use of reclaimed water

Article 3 defines that reclaimed water can be used for: irrigation, civil purposes and industrial purposes. **Irrigation:** Irrigation of crops for the production of food for human and animal consumption as well as non-food crops, and for the irrigation of green or recreation and sport areas. **Civil purposes:** i.e. washing of roads in urban centres, supply of heating or cooling system, feeding of dual supply networks (separate from drinking water network), with the exclusion of direct use of reclaimed water in building for civil use, with the exception of toilet drain systems. **Industrial purposes:** i.e. fire-fighting, industrial processing, industrial washing and thermal cycles of industrial processes, with the exclusion of the uses that involve a contact between the recovered waste water and food or pharmaceutical and cosmetic products.

### 2b. Classes of reclaimed water

The Decree only defines the reclaimed water uses and not classes.

### 2c. Requirements for the reclaimed water

Article 4 and the annex defines the requirements for the reclaimed water for irrigation and civil uses. Limit values are defined for some parameters covered by the Commission proposal and some additional parameters such as (but not limited to) COD, pH, heavy metals, phosphorus, nitrogen, sulphates, chlorides and Salmonella. Quality requirements for the parameters common with the EU proposal:

**TSS (mg/L):** 10  
**BOD5 (mg O<sub>2</sub>/L):** 20  
**E. coli (cfu/100ml):** 100

### 2d. Monitoring requirements

Article 7 defines requirements for the monitoring and control of recovery (treatment) facilities. Monitoring is agreed upon with the competent authority (i.e. the relevant regional authority in the province), based on the monitoring programme referred to in Article 49, paragraph 1 of legislative decree n. 152 of 1999. It is carried out by the treatment facility owner. The owner of the recovery facility must, in any case, ensure a sufficient number of self-checks at the plant outlet recovery, no fewer than the number envisaged in regional legislation in relation to specific uses. The results of the analysis must be made available of the control authorities. The waste water recovery plant is also subject to control by the competent authority, according to the article 49 of the legislative decree n. 152 of 1999, for the verification of the compliance with the provisions contained in the authorization referred to in Article 6.

Article 11 establishes requirements for the reuse activity: The owner of the distribution network monitors the chemical and microbiological parameters of reclaimed water as well as the environmental agronomic and ecological effects of the reuse. The health authority assesses any health and hygiene effects related to use of reclaimed water. The monitoring results are transmitted to the region with annual cadence.

### 2e. Validation monitoring

There is no requirement on validation monitoring in the decree.

### 3. Water Reuse Risk Management Plan

There is no requirement to prepare a Water Reuse Risk Management Plan. However, Article 10

<sup>67</sup> Legislative Decree 11 May 1999, n. 152, Environmental Code.

establishes that reuse for irrigation is subject to compliance with a code of good practice in the agricultural sector, referred to in the decree of the Minister for Agricultural Policies and Forestry 19 April 1999, n. 86. In the case of re-uses for multiple uses such as irrigation, civil and industrial as defined in Article 3, or with multiple users, the owner of the distribution of the reclaimed water is responsible for the correct information of the users, the methods of use, the constraints to be respected, and the risks connected to improper re-use.

#### 4. Information to the public

There is no public information requirement in the decree.

Sources: Legislative Decree 11 May 1999, n. 152, Environmental Code; and JRC, 2014, Water Reuse in Europe, Relevant guidelines, needs for and barriers to innovation.

## Portugal

### Information sheet: Portugal

#### 1. Permits & competent authorities

Pursuant to Article 58(3) of DL 236/98, the reuse of urban waste water for irrigation of agriculture and forest crops is subject to a licence issued by the relevant Administration of Hydrographical Region (ARH) - part of the Portuguese Environmental Agency - and depends on the favourable opinion of the Regional Directorate of Agriculture and the Regional Delegate for Health (DRS). Pursuant to Article 58(4), the reuse of urban waste water for irrigation of public gardens is subject to an authorisation issued by the ARH, and depends on the favourable opinion of the DRS. Even though this is not expressly required by law, the applicant must submit with his request a management plan describing namely the volume produced, the chemical, physical characteristics, physical and biological treatment of treated waste water and soil, and times of application (this is referred to in NP 4434). Any other reuses of urban waste waters would be considered as discharges of urban waste water and thus also dependent on the licence of the relevant ARH, according to Article 60 of DL 226-A/2007.

#### 2a. Use of reclaimed water

NP 4434 defines four uses for agricultural and recreational irrigation: (i) vegetables to be eaten raw; (ii) public parks and gardens, sports lawns, forest with easy public access; (iii) vegetables to be cooked, forage crops, vineyards, orchards; (iv) cereals (except rice), vegetables to be processed prior to consumption, crops for textile industry, crops for oil extraction, forest and lawns located in places with difficult or controlled public access.

The ERSAR guidelines define 17 uses in 6 categories: (i) agricultural and landscape irrigation; (ii) industrial uses; (iii) groundwater recharge; (iv) recreational uses; (v) environmental uses; (vi) non-potable urban uses (street cleaning, car washing, etc.).

As pointed out by the BIO Deloitte, ICF GHK and Cranfield University (2015) study, irrigation of vegetables whose edible parts may be in close contact with treated wastewater is forbidden.

#### 2b. Classes of reclaimed water

The requirements from NP 4434 apply to all intended uses, except for crops that are not eaten raw, for which the limits for faecal coliforms are less stringent (Source: JRC Relevant guidelines)

#### 2c. Requirements for the reclaimed water

According to the ERSAR Guidelines limit values are defined for several parameters when the reclaimed water is used for irrigation for agriculture and landscape ( however it is unclear if all of these parameters result from NP 4434). Quality requirements for the parameters common with the EU proposal:

**Helminth eggs** - 1 (eggs/l)

**TSS** - 60(mg/l)

#### 2d. Monitoring requirements

Samples should be collected at three points: the exit of the UWWTP, the delivery point to the user, and the site where the water will be used. Weekly sampling of pH, salinity and macronutrients i.e. total nitrogen, ammoniac, nitrogen, nitrates, total phosphorus and orthophosphates, and turbidity; monthly

sampling of **Helminth eggs**: yearly sampling of phosphorus and potassium, organic matter and soil pH; once in each five-years sampling of cadmium, copper, nickel, zinc, mercury and chromium. Sampling of faecal coliforms weekly or monthly. Sampling of water should be carried out at the minimum depth of 1m in agricultural fields and 1.8m in forest. Groundwater be analysed at the beginning and end of the irrigation season.

#### **2e. Validation monitoring**

There is no requirement on validation monitoring.

#### **3. Water Reuse Risk Management Plan**

Even though this is not expressly required by law, the applicant must submit with his request a management plan describing namely the volume produced, the chemical, physical characteristics, physical and biological treatment of treated waste water and soil, and times of application (this is referred to in NP 4434).

#### **4. Information to the public**

The public should be informed and allowed to be involved from an early stage of the process; nevertheless, public information should take place at all stages. The public should be informed about the objectives of the project, its benefits, the possible alternatives and the costs of those alternatives. The information provided should be clear and focused on key messages. The inclusion of a section of "frequently asked questions" is considered essential. The information can be provided through several means, but the internet is considered essential. Provision of information during a crisis situation should be based on previously prepared communication plans and can include statements from specialists.

Sources: ERSAR Guidelines 14: Reuse of urban waste water; JRC, 2014, Water Reuse in Europe, Relevant guidelines, needs for and barriers to innovation; and BIO Deloitte, ICF GHK and Cranfield University, 2015, Optimising water reuse in the EU, Final report – Part I.

## **Spain**

### **Information sheet: Spain**

#### **1. Permits & competent authorities**

The competent authority to grant the permit is the territorially competent basin organization. There are three different procedures for obtaining the permit depending on who is the applicant:

1. When the request to reuse water is made by someone already a licensee for the first use of the waters (Article 8), the procedure for obtaining the permit starts with the submission of the request to the competent authority indicating the objective of the reuse. The applicant must submit a project of reuse of waters with all documents needed (origin and localization of the delivered points for treated and reclaimed water, characteristics of the water, volume requested, use, etc.). Finally, if the final use of the waters is agricultural, then the applicant must provide the ownership of the land that will be irrigated. The competent authority must review the application and if it decides to proceed then it must request a report from the Autonomous Community/ies affected so they provide comments on the matters of their competence. The competent authority will then elaborate a proposal where it will establish the conditions of the permit. The applicant must decide on the proposal within a period of 10 days.
2. When the applicant has a discharge permit (Article 9), he will receive an additional administrative permit when all requirements and conditions on the reuse of water are established. If the permit on the reuse of water is requested at the same time than the discharge one, then the water reuse permit will be subject to the approval of the other. The Royal Decree includes in its annex the form to request the reuse. The review of the permit and grant of the permit follows the same rules as above.
3. When the applicant is a third party with no license for the first use of water or do not have a discharge permit or do not want to request it (Article 10), then the procedure is the general one for concessions included in Royal Decree 849/1986 on the Regulation of the Hydraulic Public Domain, but using the form included in the Annex of RD 1620/2007.

In any case all permits must be registered in the Register of Waters

### **2a. Use of reclaimed water**

The Royal Decree (RD)<sup>68</sup> (Article 4) includes the permitted uses for reclaimed water by cross-referencing Annex IA which includes a list of quality criteria required for each type of use. Therefore, the RD includes different criteria for the following types:

1. Urban Use: e.g. residential use (Irrigation of private gardens, and discharge of sanitary appliances); services (Irrigation of urban green areas (parks, sports fields and similar)), Street washing, Fire systems, and industrial washing of vehicles;
2. Agricultural use (see below)
3. Industrial use: e.g. process and cleaning waters except in the food industry; other industrial uses; process and cleaning waters for use in the food industry; cooling towers and evaporative condensers;
4. Recreational use: e.g. irrigation of golf courses; ponds, water masses and ornamental circulating flows, where public access to water is impeded;
5. Environmental use: e.g. aquifer recharge by located percolation through the land; groundwater recharge by direct injection; irrigation of forests, green areas and other types not accessible to the public; forestry; other environmental uses (maintenance of wetlands, minimum flows and similar).

For any other use, the competent basin organisation will require quality conditions adapted to the most similar use in the RD. The applicant must in any case explain the reuse for this other kind of use.

The RD (Article 4) expressly forbids the use of reclaimed water:

- a) For human consumption, except situations declared a catastrophe in which the health authority will specify the levels of quality required to those waters and the uses.
- b) For the proper uses of the food industry, as determined in Article 2.1.b) of Royal Decree 140/2003, of February 7, establishing the sanitary criteria for the quality of drinking water for humans (this is, all waters used in the food industry for the purpose of manufacturing, treatment, conservation or sale of products or substances intended for human consumption, as well as those used in the cleaning of surfaces, objects and materials that may be in contact with the food), except as provided in "Annex IA3.quality 3.1.c)" for the use of process and cleaning water in the food industry.
- c) For use in hospital facilities and other similar uses.
- d) For the culture of filtering molluscs in aquaculture.
- e) For recreational use such as bathing water.
- f) For the use in cooling towers and evaporative condensers, except for those intended for industrial use in "Annex I.A.3.quality 3.2."
- g) For use in ornamental fountains and sheets in public spaces or interiors of public buildings.
- h) For any other use that the health or environmental authority considers a risk to the health of the people or a harm to the environment, whatever the moment in which that risk or damage is appreciated.

### **2b. Classes of reclaimed water**

The RD includes a list of quality criteria required which varies depending on each type of use, for agricultural use the following classes are distinguished:

**Quality<sup>69</sup> 2.1** Irrigation of crops with a water application system that allows direct contact of reclaimed water with the edible parts for fresh human consumption;

**Q. 2.2** Irrigation of products for human consumption with water application system that does not avoid the direct contact of regenerated water with the edible parts, but consumption is not fresh but with a subsequent industrial treatment; Irrigation of pastures for consumption of milk or meat producing animals; Aquaculture;

<sup>68</sup> Royal Decree: Ministerio de Medio Ambiente, "Guía para la Aplicación del R.D. 1620/2007 por el que se establece el Régimen Jurídico de la Reutilización de las Aguas Depuradas".

<sup>69</sup> Abbreviated subsequently to "Q", for the purposes of this report.

**Q. 2.3** Localised irrigation of woody crops that prevents the contact of reclaimed water with the fruits consumed in human food; Irrigation of ornamental flower crops, nurseries, greenhouses without direct contact of reused water with production; Irrigation of non-food industrial crops, nurseries, silage, cereals and oilseeds.

#### **2c. Requirements for the reclaimed water**

The Spanish legislation applies to several uses, not only agriculture. Quality criteria varies depending on the use. Article 5 also specifies that if reused water has several uses, the most stringent values of the intended uses shall apply. Competent authorities can also demand criteria for other pollutants not included in the RD and even demand stringer values than those in the RD (they need to motivate their decision in such case).

For agricultural use, limit values are defined for various parameters, including some covered by the EU proposal depending on the water class:

##### **Q 2.1:**

**intestinal nematodes:** 1 egg/10 L

**E. coli:** 100 UFC/100 mL

**TSS:** 20 mg/L

**Turbidity:** 10 UNT

**Legionella spp.** 1,000 CFU / L (if there is a risk of aerosolisation)

It is mandatory to carry out the detection of pathogens Presence/ Absence (**Salmonella**, etc.) when it is repeated habitually that  $c = 3$  for  $M = 1.000$

##### **Q. 2.2:**

**intestinal nematodes:** 1 egg/10 L

**E.coli:** 1000 UFC/100 mL

**TSS:** 35 mg/L

**Turbidity:** No limit

It is mandatory to carry out detection of pathogens Presence/ Absence (**Salmonella**, etc.) when it is repeated habitually that  $c = 3$  for  $M = 10,000$

##### **Q. 2.3:**

**intestinal nematodes:** 1 egg/10 L

**E.coli:** 10000 UFC/100 mL

**TSS:** 35 mg/L

**Turbidity:** No limit

**Legionella spp.** 100 CFU / L

#### **2d. Monitoring requirements**

According to Annex I.B on minimum frequency of sampling and analysis of each parameter, the monitoring must be done at the exit of the regeneration plant, and at all delivery points to the user.

The frequency of analysis will be modified in the following cases:

- I. After 1 year of control a motivated request can be presented to reduce the frequency of analysis up to 50%, for those parameters that are not likely to be present in the waters.
- II. If the number of samples with a concentration lower than the maximum admissible value of Annex I.A is less than 90% of the samples during one-quarter, the sampling frequency for the following period will be doubled.
- III. If the result of a control exceeds at least one of the parameters the maximum deviation ranges established in Annex I.C, the control frequency of the parameter that exceeds the deviation ranges will double during the rest of this period and the following one.

The annex includes a table with the minimum frequency of sampling per use and type of pollutant. The requirements for the parameters covered by the EU proposal depending are:

##### **Q2.1**

intestinal nematodes: every 15 days

E. coli, TSS, turbidity: weekly

Q2.2 and Q2.3

intestinal nematodes: every 15 days

E. coli, TSS: weekly

Turbidity: --

## **2e. Validation monitoring**

There is no requirement on validation monitoring

## **3. Water Reuse Risk Management Plan**

When requesting the permit, the applicant must submit a water reuse project that includes the necessary documentation to identify the origin and geographical location of the delivery points for purified and reclaimed water; the characterisation of purified water; the requested annual volume; the use for which it is destined; the place of use of the reused water, specifying the characteristics of the infrastructures foreseen from the exit of the reused water system to the places of use; the quality characteristics of the reused water corresponding to the intended use as well as the proposed analytical self-control as established in Annex I; the water reuse system; the control and signalling elements of the reuse system; the measures for the efficient use of water and the risk management measures in case the quality of the reclaimed water does not comply with the criteria established in Annex I corresponding to the permitted use. The form included in the Annex includes a question on the existence of measures on risk management in case inadmissible quality of the waters for the admitted use. No other specification is included regarding this topic.

## **4. Information to the public**

The RD does not contain any provision at this regard. However, regarding the third type of procedure, when the applicant is a third party that has no license for the first use of waters or do not have a discharge permit or do not want to request it, Article 10 cross-refers to Royal Decree 849/1986 on the Regulation of the Hydraulic Public Domain to follow the general procedure on concessions. In this case, if the request is accepted by the competent authority then there is a period of public information of between 20 days to 1 month.

Sources: Royal Decree: Ministerio de Medio Ambiente, "Guía para la Aplicación del R.D. 1620/2007 por el que se establece el Régimen Jurídico de la Reutilización de las Aguas Depuradas"; and JRC, 2014, Water Reuse in Europe, Relevant guidelines, needs for and barriers to innovation.

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