
acquedotto
pugliese
l'acqua, bene comune

acquedotto pugliese

l'acqua, bene comune

RE-USING TREATED WASTE WATER

The experience of Acquedotto Pugliese

Prof. Eng. Domenico Laforgia

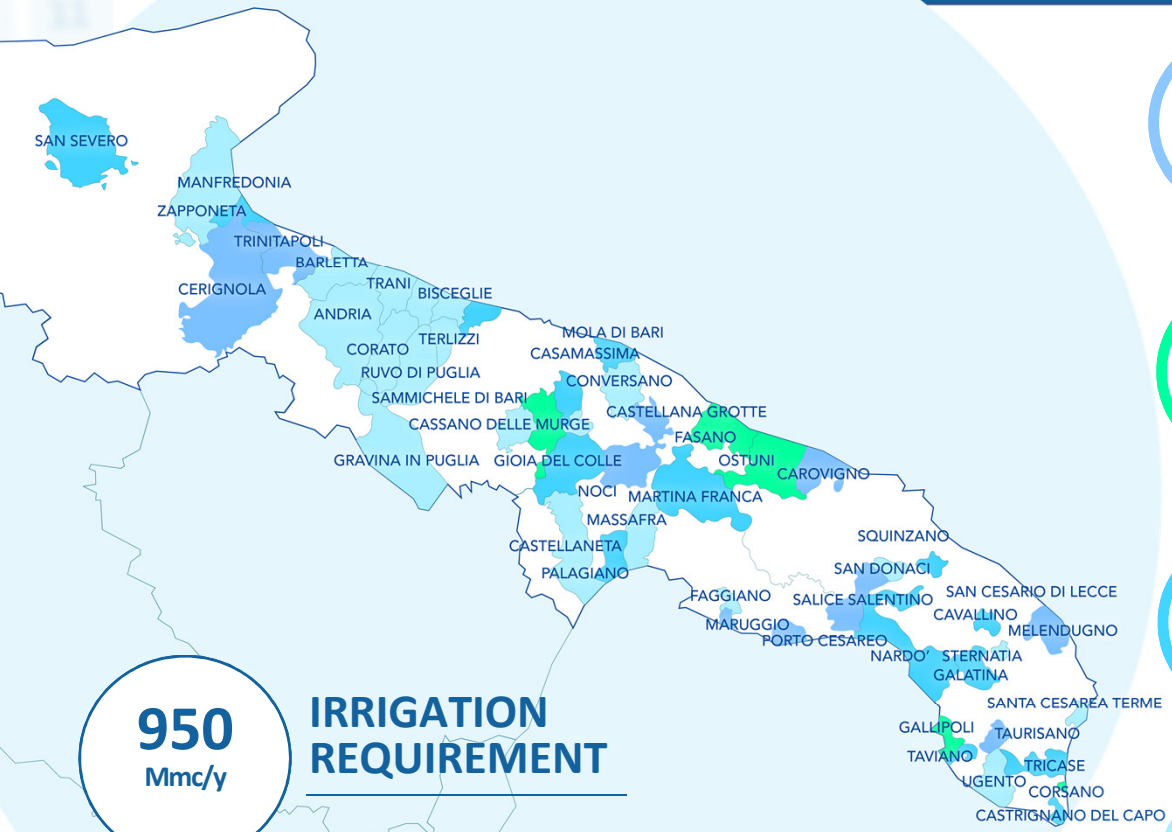
Chairperson

30th March 2023 - Villa Nova de Gaia

AQP SYSTEMS FOR RE-USE

acquedotto pugliese
l'acqua, bene comune

TOTAL 79.3 MMC/Y



950 Mmc/y — **IRRIGATION REQUIREMENT**

0.6 Mmc/y — **VOLUMES FOR IRRIGATION 2022**

11 — **SYSTEMS ALREADY CONFIGURED** — **15.6** MMC/YEAR

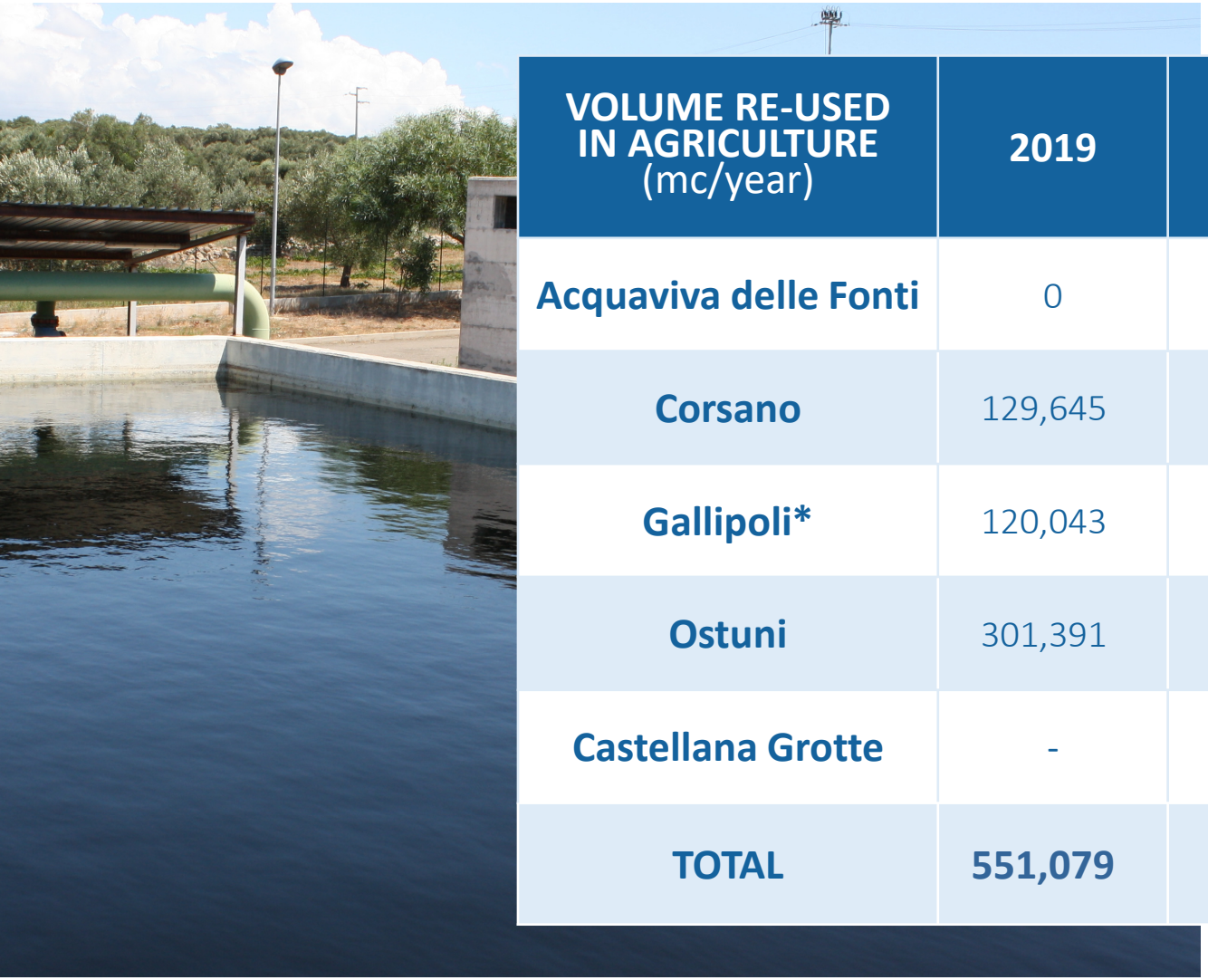
5 — **SYSTEMS PROVIDING FOR IRRIGATION USE** — **7.4** MMC/YEAR

20 — **ADJUSTMENTS INCLUDED IN IMPROVEMENTS ALREADY IN PROGRESS** — **24.3** MMC/YEAR

19 — **SPECIFIC RE-USE INTERVENTIONS** — **32** MMC/YEAR

- **12** in the project stage – **€17 M**
- **1** being contracted – **€0.5 M**
- **6** being executed – **€7.5 M**

RE-USING TREATED WASTEWATER



VOLUME RE-USED IN AGRICULTURE (mc/year)	2019	2020	2021	2022
Acquaviva delle Fonti	0	0	155,700	134,400
Corsano	129,645	108,465	160,990	143,075
Gallipoli*	120,043	53,369	154,245	149,828
Ostuni	301,391	69,040	124,715	75,805
Castellana Grotte	-	-	-	63,345
TOTAL	**551,079**	**230,874**	**595,650**	**566,453**

*some of the treated wastewater from the Gallipoli sewage treatment plant is used by the city council for civil uses (street cleaning and watering parks)

REGIONE PUGLIA REGULATION NO. 8/2012

The purification service for re-using treated wastewater is **an integral part of the Integrated Water Service** and the relevant costs are **covered by the rates**: the recovered wastewater is **supplied by AQP free-of-charge** to the distribution network provider

Re-using refined wastewater **contributes to achieving the quality objectives** envisaged in the Regional Water Protection Plan:

- water resources quality and quantity protection
- reduction of surface and underground water withdrawal
- reduction of impact on reservoirs

REGIONE PUGLIA REGULATION NO. 8/2012

Acceptable usage of recovered wastewater: **environmental, irrigation, civil and industrial**

Re-use is implemented through a **Plan of Managing the system of recovered wastewater re-use**, drawn up by Regione Puglia, which contains:

- the subjects responsible for managing and controlling the various stages of the recovery cycle
- the characteristics of the wastewater before recovery and any presence of limiting elements
- the flow rate of the waters treated in the purification system compared treated ones
- the instructions on the final use contemplated for the recovered waters
- the conveyance and distribution system
- the income statement of the investments and of the management of the recovery and reuse system

CONSIDERATIONS AND PROSPECTS

The climate changes occurring, the impairment of the quality of the aquifer and the growing human pressure on the territories mean that **all the resources available must be used to the full**

In this perspective, **the treated and purified wastewater becomes a useful and reliable resource** for its availability and quality, as it is produced continuously and constantly monitored, simultaneously **limiting the withdrawal of precious water from the subsoil**

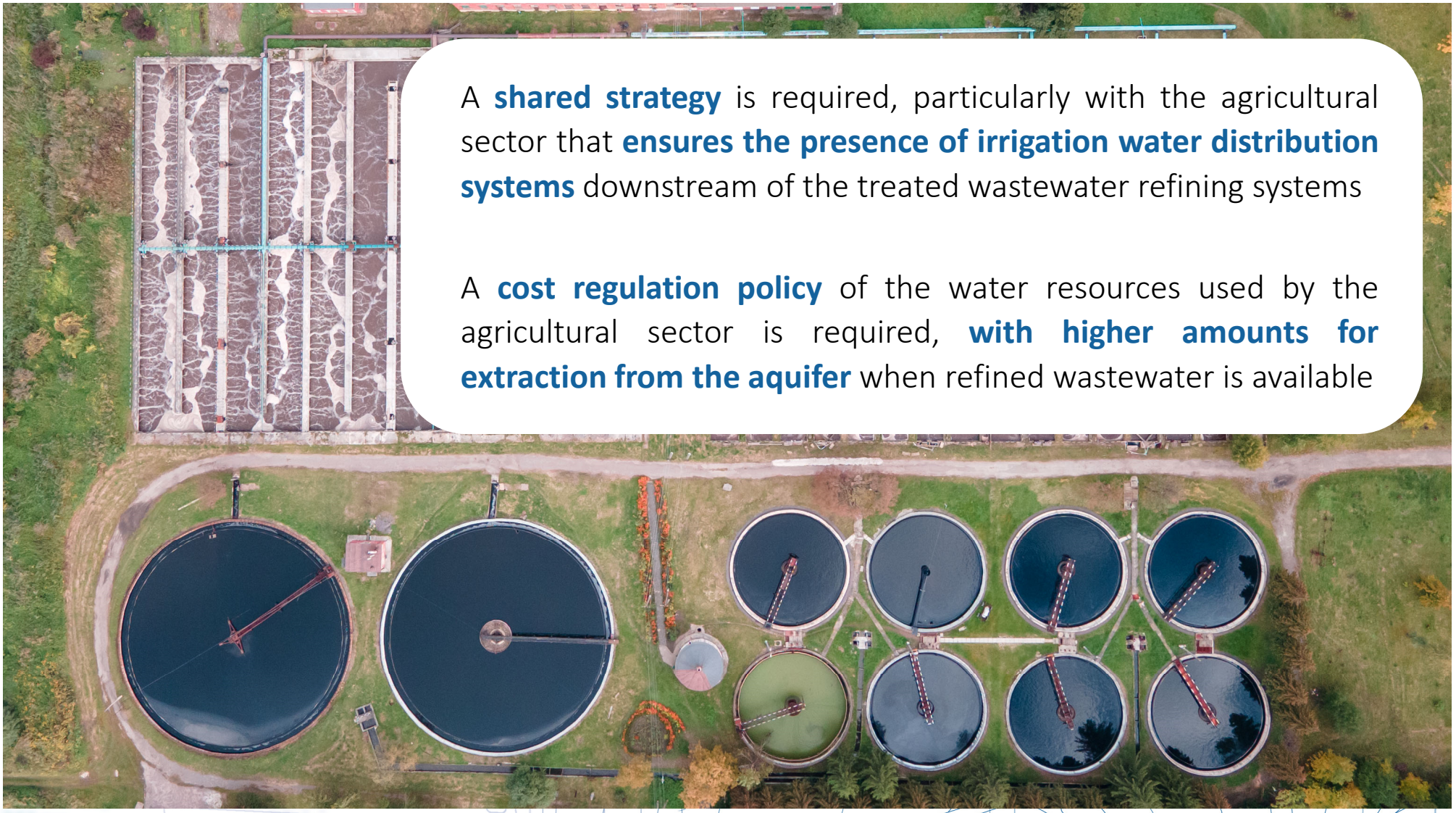
It would desirable **to permit indirect re-use** of the refined wastewater **to replenish the aquifer,** with the aim of contrasting salt water intrusion

CONSIDERATIONS AND PROSPECTS

Re-use is particularly **advantageous in agriculture**, both in terms of cost effectiveness of the water and in terms of reduction of the need to use fertilizers thanks to the natural phosphate and nitrogen content, but it is also becoming important in other areas of use (watering gardens, street and public space cleaning, fire water reserve, environmental requalification)

The significant limitations of Min Dec. 185/2003, which envisages the same limit values to respect for re-use both for watering tall trees or vegetables, have meant that **in Italy** the wastewater to be re-used in 2021 still only amounts to **4% of the available volume**

CONSIDERATIONS AND PROSPECTS



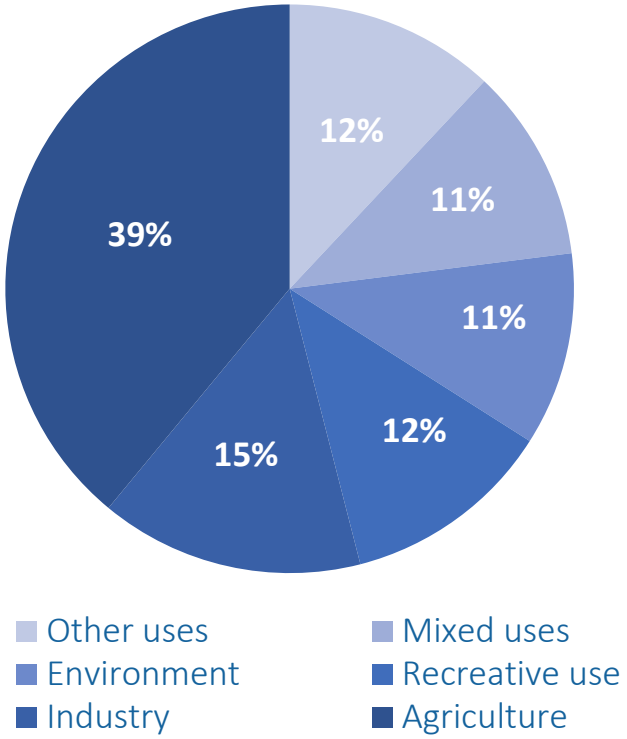
A **shared strategy** is required, particularly with the agricultural sector that **ensures the presence of irrigation water distribution systems** downstream of the treated wastewater refining systems

A **cost regulation policy** of the water resources used by the agricultural sector is required, **with higher amounts for extraction from the aquifer** when refined wastewater is available

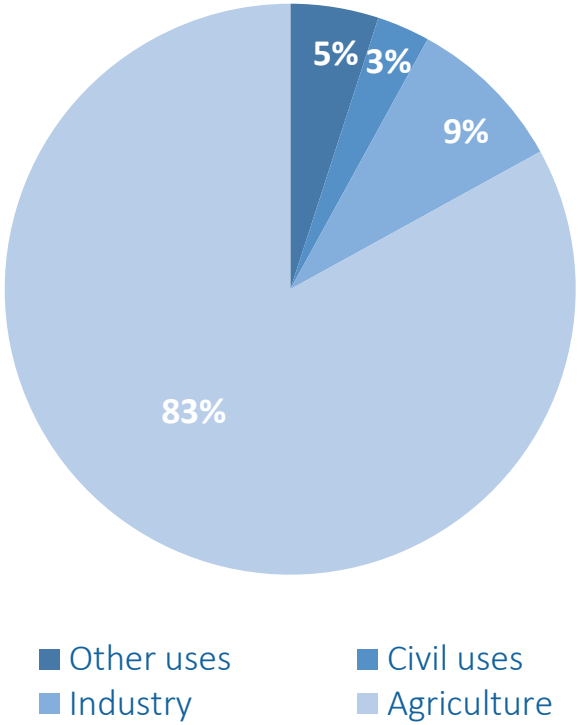
RE-USE IN ITALY AND EUROPE

The final re-uses in Italy are significantly different from those in Europe, with a net prevalence of use in irrigation

WATER REUSE IN EUROPE



WATER REUSE IN ITALY



Source – Utilitalia survey on re-use in Italy - 2022

Regulation EU 2020/741

Re-use of wastewater in agriculture is further favoured by the implementation of European Regulation 2020/741 that, unlike Min. Dec. 185/2003, presents a “fit-for-purpose” approach, with differentiated limit values to respect according to the crops

A risk management plan is envisaged connected to the re-use of purified water (as already envisaged by the Regione Puglia Regulation no. 8/2012)

RECLAIMED WATER QUALITY CLASS	INDICATIVE TECHNOLOGY TARGET	QUALITY REQUIREMENTS				
		E. COLI (NUMBER/100 ML)	BOD_5 (MG/L)	TSS (MG/L)	TURBIDITY (NTU)	OTHER
A	Secondary treatment, filtration, and disinfection	≤ 10	≤ 10	≤ 10	≤ 5	*Legionella* spp.: < 1 000 cfu/l where there is a risk of aerosolisation Intestinal nematodes (helminth eggs): ≤ 1 egg/l for irrigation of pastures or forage
B	Secondary treatment, and disinfection	≤ 100	In accordance with Directive 91/271/EEC (Annex I, Table 1)	In accordance with Directive 91/271/EEC (Annex I, Table 1)	-	
C	Secondary treatment, and disinfection	≤ 1 000			-	
D	Secondary treatment, and disinfection	≤ 10 000			-	

Table 2- Regulation EU 2020/741

DRAFT PRESIDENTIAL DECREE ON RE-USE IN ITALY

The new draft presidential decree being discussed in Italy by the Ministry of Environment (MASE), aims at aligning the domestic legislation with the new site risk management method defined by Regulation EU 2020/741

For re-use in agriculture it envisages additional parameters with respect to Regulation EU 2020/741 as well as limitations to re-use in the event of industrial activities that discharge in public sewers (not envisaged by EU Regulation)

QUALITY CLASS (3)	INDICATIVE TECHNOLOGICAL OBJECTIVE (3)	QUALITY REQUIREMENTS									
		E. COLI § *(NUMBER/ 100 ML)(3)*	BOD^5 $(MG/LO2)_{(3)}$	TSS $(MG/L)_{(3)}$	TURBIDITY $(NTU)_{(3)}$	LEGIONELLA SPP. § (UFC/L) (*)(3)	INTESTINAL NEMATODES§ (**)(3)	NTOT (MG/L) ‡	PTOT (MG/L) ‡	SALINITY (PSU)***	SALMONELLA SPP.
A	Secondary, Tertiary treatment, filtratration and disinfection	≤ 10	≤ 10	≤ 10	≤ 5	≤ 1000	≤ 1 egg /L	In compliance with leg. dec. 152/2006 (table 2 if applicable, table 3, annex 5, part III)	In compliance with leg. dec. 152/2006 (table 2 if applicable, table 3, annex 5, part III)	≤ 10	absent
B	Secondary, Tertiary treatment and disinfection	≤ 100	In compliance with directive 91/271/CE (annex I, table 1)	In compliance with directive 91/271/CE (annex I, table 1)	-	≤ 1000	≤ 1 egg /L			≤ 10	absent
C	Secondary, Tertiary treatment and disinfection	≤ 1000			-	≤ 1000	≤ 1 egg /L			≤ 10	absent
D	Secondary, Tertiary treatment and disinfection	≤ 10,000			-	≤ 1000	≤ 1 egg /L			≤ 10	absent

Table 2 – Classes of quality and quality rules of refined waters for irrigation purposes in agriculture - Draft Presidential Decree

acquedotto pugliese
l'acqua, bene comune

THANK YOU

30th March 2023 - Villa Nova de Gaia

acquedotto pugliese

l'acqua, bene comune

Acquedotto Pugliese Spa
con Unico Azionista Regione Puglia

Italy - 70121 Bari, Via Cognetti 36

www.aqp.it