Case study factsheet

Flanders, Belgium

Last update on 2023-03-24

Project B-WaterSmart

Region Flanders , **Belgium**

Description

Living Lab Flanders aims to assess the regional water system and its potential for incorporation of water-smart solutions, close water cycles and increasing resilience. Water availability and demand including potential alternative water sources will be modelled using UWOT to develop a regional strategy to increase water system robustness. The QMRA tool will be developed to assess water reuse safety.

Practical implementation of water reuse will be demonstrated on two sites (Diksmuide and Mechelen) with high transferability potential for the region:

i) Use of effluent or off-spec water to produce drinking water in Diksmuide
To reuse municipal effluent as drinking water, it has to be decided how to connect the wastewater treatment with the drinking water treatment, e.g. which technologies to choose and when to mix it with other drinking water sources, such as surface water. Technical demonstration of effluent reuse for drinking water with varying levels of pre-treatment will be carried out with a flexible pilot set-up containing ultrafiltration (UF), nanofiltration (NF), reverse osmosis (RO), UV desinfection and an activated carbon filter.
To cope with off-spec water qualities, a more performant drinking water installation is needed. Therefore, RO tests are carried out with focus on minimizing water losses. A demo scale CCRO (closed circuit reverse osmosis) of 10 m^3/h will be installed.
For both test situations the technology options will be compared with respect to ensuring water supply, concentrated waste stream management, microbial and chemical water quality, and cost benefit analysis.

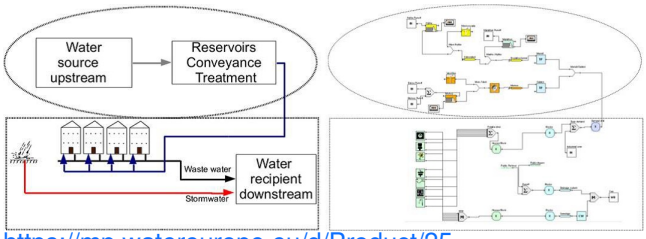
ii) Urban reuse of storm water for irrigation in Mechelen
In Mechelen, a basin has been built to collect storm water to prevent flooding in the region. To link the buffer function to a reuse function, the discharge of the basin is controlled by the storm water management tool to achieve maximum water storage. A first control module for the buffer basin will safeguard the buffer function, based on weather forecasts and the current state of the basin. A second control module will regulate the distribution of water to the connected fields, based on the available water volume, the irrigation needs of the crops and the groundwater level. Rainwater quality is monitored and water treatment is adjusted for potential pollutants to prevent groundwater pollution.

Applied technologies

- **Biological systems**
- **Surface water and infiltration systems**
- **Urban Waterbuffer**
- **Desalination technologies**
- **Ultrafiltration or nanofiltration with RO regenerated membranes**
- **UV/Ozone**

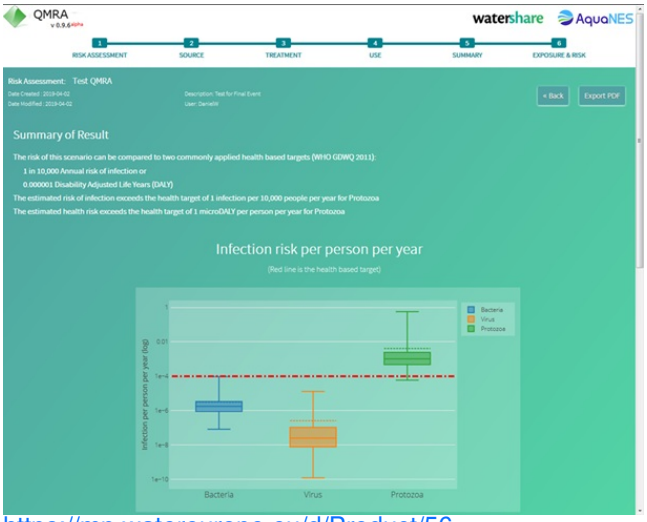
Applied products

Urban Water Optioneering Tool



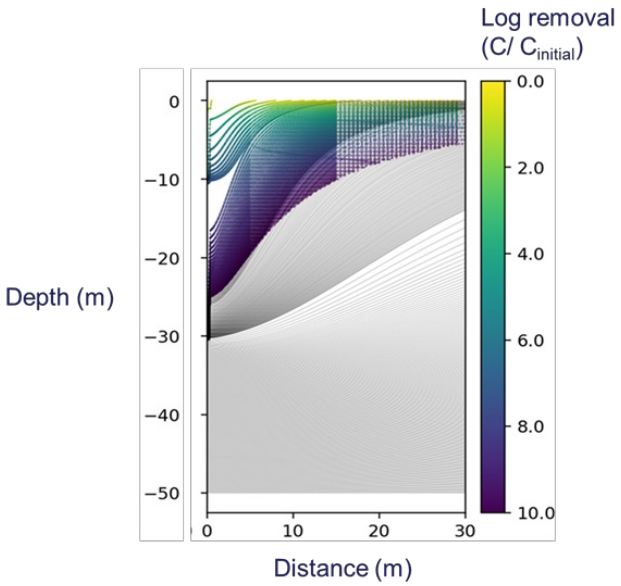
https://mp.watereurope.eu/d/Product/25

Quantitative Microbial Risk Assessment



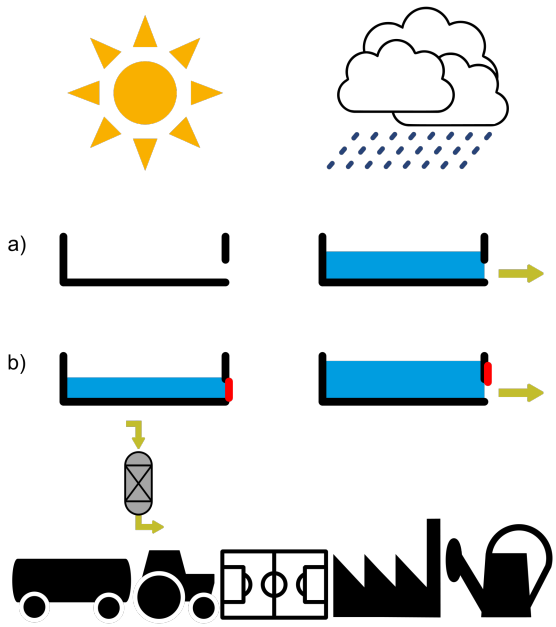
https://mp.watereurope.eu/d/Product/56

Subsurface Transport and Removal



https://mp.watereurope.eu/d/Product/59

Stormwater reuse system for agriculture



https://mp.watereurope.eu/d/Product/63

Scales

Operational scales of this case study related to the application of tools and technologyies

- Local scale
- City scale

Challenges

Challenges that are addressed through the application of tools and/or technologies to the case study

- Water Scarcity
- Limitations to water reuse due to high salinity/nitrates
- High drinking water demand due to dense or growing resident population and economy
- High or increasing irrigation water demand for agriculture
- Groundwater overexploitation
- Water quality deterioration

Related tags

water robustness | RO | effluent reuse | stormwater reuse | buffer basin | subirrigation | QMRA

Contact data

Contact person

Han Vervaeren (han.vervaeren@dewatergroep.be, De Watergroep); Stefanie Moerenhout (stefanie.moerenhout@dewatergroep.be, De Watergroep); Joris de Nies (joris.de.nies@proefstation.be, Proefstation voor de Groenteteelt); Birte Raes (birte.raes@aquafin.be, Aq

Involved organisations

1. Aquafin NV (AQUA)
2. KWR Water B.V. (KWR)
3. Proefstation voor de Groenteteelt vzw (PSKW)
4. VITO nv (VITO)
5. Vlaamse Maatschappij voor Watervoorziening /De Watergroep (DeW)

URL

https://b-watersmart.eu/living-lab/flanders-belgium/