Recovery and utilisation of nutrients for low impact fertiliser

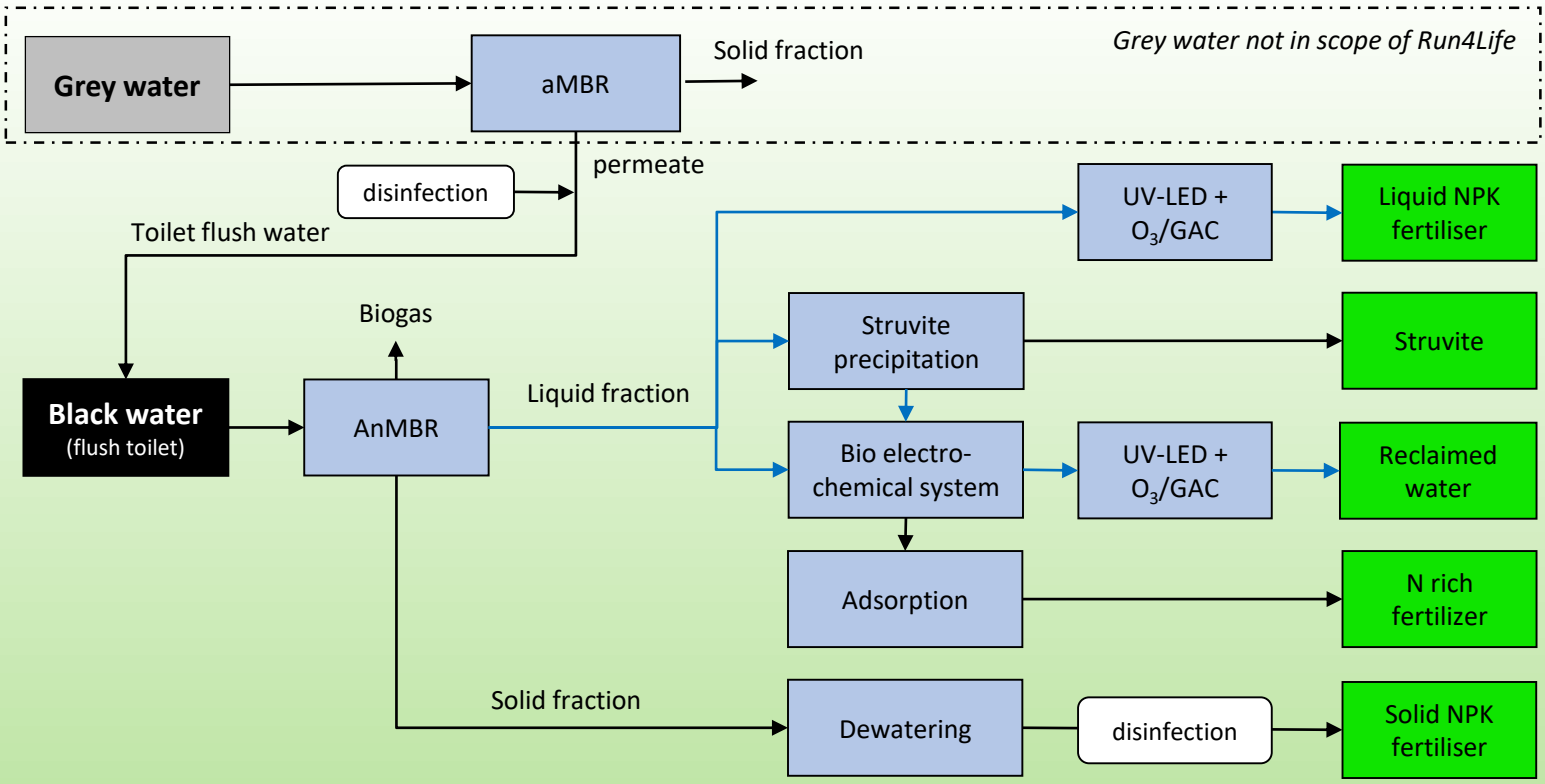
Demonstration site fact sheet - Vigo

Resource recovery at an office building complex

“Centro de Negocios Porto do Molle” is a business centre promoted by the Consorcio Zona Franca de Vigo (Free Trade Zone of Vigo) in Nigrán (Pontevedra, Spain). The building, awarded with the BREEAM certificate (Building Research Establishment Environmental Assessment Methodology), is a referent in sustainable architecture. The office building hosts around 40 small and medium enterprises, acting as a business centre and business incubator. The building is equipped with segregated grey and black water collection in all bathrooms, which on average are used by around 200 people during working hours. The demonstration site, installed in the basement of the building, is managed under the leadership of Aqualia with the support of the University of Santiago de Compostela. All of the produced grey water in the building is treated and reused after disinfection for toilet flushing, reducing the water footprint of the building. Within the Run4Life project, black water is treated in an Anaerobic Membrane Bioreactor (AnMBR) and, after disinfection treatments, it can directly be used for fertigation. Alternatively, the liquid fraction can be further treated to recover phosphorous, by precipitation of struvite, and/or nitrogen, by adsorption processes. An innovative Bio-Electrochemical System (BES) is also included in the flowchart.

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement no 730285.

https://run4life-project.eu



Resource recovery tailored to varying needs for different products

Grey water is treated by an aerobic Membrane Bioreactor (aMBR) and then used to flush toilets. The produced toilet wastewater (black water) is collected with a conventional gravity sewer system, and then treated in an Anaerobic Membrane Bioreactor (AnMBR), producing biogas, and both a solid and a liquid effluent. The liquid fraction is free of solid particles after ultrafiltration with the membranes. It can be used seasonally for fertigation in agriculture after tertiary treatment by means of UV-LED, ozone (O_3) and/or granular activated carbon (GAC) for the control and removal of micro-pollutants and pathogens. The solid fraction of the AnMBR will be disinfected and can be used as solid NPK fertiliser for agriculture.

When there is no agricultural demand for the liquid NPK fertiliser, the liquid fraction will be subsequently treated to produce nutrient-free water and recover nutrients. Phosphorus can be recovered by struvite precipitation, and nitrogen is recovered using adsorption processes in combination with a bio-electrochemical system. The products, struvite and a rich ammonium nitrate solution, are useful in agriculture.

Key features of Vigo demo-site:

- ✓ Recycling of grey water for toilet flushing
- ✓ Reclaimed water for irrigation
- ✓ Recovery of various fertiliser products
- ✓ Production of biogas
- ✓ Innovative BES to recover nitrogen

Contact: Nicolas Morales Pereira
nicolas.morales.pereira@fcc.es