

# Resourceful Organics: Leading the Way in Willow Filtration

*The innovative use of willow as a biological filter for dirty water is gaining ground here, thanks to the inventiveness of a recently formed local company Resourceful Organics Limited.*



Bill Goudie, Director, N. Ireland Water; Sean Hogan, Chairman of N. Ireland Water & AFBI NI; Minister for NI Regional Development, Danny Kennedy; John Gilliland, Director, Original Heating Ltd, monitoring the flow of waste water onto the crop of willows at Drumkee, Rural Waste Water Treatment Works, Co. Tyrone.

It has been established on the Brook Hall Estate in Londonderry to commercialise the use of willow coppice to reduce the environmental footprint of both the Agri Food and Water Industries.

The two directors of the company, which has already secured and delivered a 20 year contract to build and operate Northern Ireland Water's first willow waste water treatment works at Drumkee in County Tyrone, are regarded as world leaders in their field and have been developing the concept of using willows as a biological filter since 1995.

Brook Hall Estate owner Dr John Gilliland is a leading specialist in the growing of willow coppice and the production of renewable heat, working with the Agri-Food and Biosciences Institute (AFBI) to commercialise the willow crop, here in Europe, North America and the Ukraine.

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The Brook Hall Estate





Dahn Rosenquist, of Laqua Treatment AB, Sweden, is a leading irrigation and controls system specialist, who has been working with the Swedish University of Agriculture Science, developing willow irrigation systems for the last twenty years.

The system is not just ideal for treating municipal effluent from waste water treatment works such as that at Drumkee, but it can be employed to provide a wide range of solutions for both the public and private sectors.

"For example, it can equally as well treat trade effluents from a variety of production and processing activities such those within the farming and agri-food sectors," says Project Manager Alexander Gilliland. "It can also be used to treat leakages from disused landfill sites and silage pits."

The irrigation "proof of concept" trial at Drumkee, run in collaboration with Northern Ireland Water, was originally launched in 2013 by the then Minister for the Department of Regional Development Danny Kennedy.

The waste water treatment works there was quite old and at risk of failing to meet the limitations set out in water quality legislation like the EU Water Frameworks Directive, so Northern Ireland Water looked to Resourceful Organics for a cost effective, low carbon and environmentally sound way to help treat the dirty water out of the treatment works which serves around 20 people.

Working with the local land owner, Northern Ireland Environment Agency and Northern Ireland Water, and in conjunction with their contractor C.J.McIvor, Resourceful Organics provided a complete solution, from design, installation, operation and compliance with the legal and legislation constants.

The entire irrigation system including pumps, soil moisture sensors and rain fall gauges was designed and created by Director Dahn Rosenquist, and is entirely automatic and can be controlled remotely using software developed and designed by Dahn, enabling him to monitor and control an irrigation system in Ireland from the comfort of his home in Sweden.

Blending into the surrounding landscape, the Drumkee willow waste water treatment system will reduce that NI Water WWTW's cost by 30%, and its greenhouse gas emissions by 1,500%, while delivering compliance with the EU Water Frameworks Directive, over its twenty year life.

"To date the project is running well with very little downtime due to environmental conditions," says Alexander.



John Gilliland, Director, Resourceful Organics Ltd, explaining to Minister, Danny Kennedy and Sean Hogan, Chairman, N. Ireland Water, the on going willow site monitoring being provided, to warrant N. Ireland Environment Agency awarding the project, UK's first Variable Discharge Consent. Ground water is measured through regular sampling of a collection of bore holes to below the water table, one of which is under the black vertical pipe in the centre of the picture



The Willow irrigation system

As a bonus, the waste water is also put to good use - to fertilise the site's one hectare of land, which grows 15,000, short rotation willow trees, coppiced every three years, before regrowing from the same tree stumps. The resultant wood is used to fuel automated wood fired boilers, which subsequently produces renewable heat.

Following the success of the project at Drumkee, Northern Ireland Water have awarded Resourceful Organics another project - at Dromore in County Tyrone - under the INTERREG Agricultural Need for Sustainable Willow Effluent Recycling (ANSWER) Project. The ANSWER project is a collaboration of local county councils, utility companies and the Agri-Food and Biosciences Institute (AFBI).

This new irrigation project, to be commissioned shortly, is 15 times bigger than the Drumkee scheme. It will take effluent from the Dromore waste water treatment works along a 1200m pipeline to several willow fields owned by a local farmer.

## GREAT POTENTIAL

The significance and potential of these 'proof of concept' trials cannot be underestimated. Throughout Ireland, and indeed, throughout Europe, there are many hundreds of small scale WWTWs and septic tanks treating small populations of up to a few hundred, some of which arguably over the recent decades have been largely ignored and are currently suffering from under investment with respect to upgrading and maintenance. This is compounded by recent population increases whereby the load capacity can often exceed the WWTWs design capacity. Although the discharge volumes from these treatment works are relatively small, their compounded polluting effects into our environmental waters and catchment basins can be significant, thus contributing to failing water quality standards as required under the EU Water Framework Directive.

Understandably, the team at Resourceful Organics believes there are significant opportunities for the expansion of uptake of SRC willow biofiltration systems to help manage waste water, not just locally, but globally, too.



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