

Natural Energy Efficiency and Sustainability (NEES)

Best Practice in Products and Services

1. Product Description

Constructed wetland systems and reed beds are a natural sewage treatment option, able to provide high quality effluent treatment for septic tanks, industry and municipal applications without the use of pumps, blowers or chemical additives. They can also fit in well around existing systems to achieve a high quality effluent discharge. Zero discharge willow facilities are 100% evapotranspiration systems that rely upon quick growing biomass willow varieties and a carefully designed basin layout to ensure that no discharge to ground water or surface water is necessary.

2. 'Natural' and/or 'recycled' content

Constructed wetland systems, reed beds and zero discharge willow facilities all rely upon the action of plants to treat, or evaporate 100% of the effluent entering the system. In this way they are a very natural system that typically have lower energy requirements than conventional effluent treatment. In fact, willow facilities can be net carbon negative in that they will produce more energy in terms of a biomass crop over their lifetime than is consumed by initial embedded energy in construction and pumping (required for the willow facilities to get an even spread of effluent) requirements.

3. Percentage of the product processed and / or manufactured in the NPP region

Constructed wetlands use indigenous soils as the growing medium, as do willow facilities. Reed bed systems use locally available gravel. The plastic liner (unless indigenous clay is sufficient) is imported. All wetland plants (provided by FH Wetland Systems) in constructed wetlands and reed beds are native wetland species, sourced within Ireland. The willow cultivars used in the zero discharge willow facilities are Scandinavian bred cultivars specifically for biomass production.

4. Recyclability / biodegradability

The plants used are all natural biodegradable, and the willow facilities can recycle sewage nutrients into firewood.

5. Contribution to energy efficiency in buildings

Constructed wetland systems and reed beds can both be a major contribution to energy saving in any home by providing high quality, zero energy sewage treatment. Willow facilities go a step further and provide a biomass crop to offset fossil energy requirements in your home. FH Wetland Systems Ltd. Willow facilities are designed in partnership with a Danish company, Centre for Recycling, and use a pumped distribution system for evenly spreading the effluent and providing consistent growth rates of the willow trees. Although this uses electricity, this is more than offset by the energy provided by the trees in the form of firewood.

6. Lifespan

All of these systems have a long lifespan, and where appropriate maintenance is adhered to, can last for many decades without trouble.

7. Costs – Product and maintenance

Constructed wetland systems and reed beds are similar in cost to standard domestic scale sewage treatment systems. Where self-construction is possible this can greatly reduce the costs to the homeowner. Where high quality effluent standards are needed, the costs will rise accordingly on account of the additional area requirements. Costs can vary from c.€1000-4000 for standard secondary treatment scale systems, in addition to the septic tank and percolation systems. Willow facilities can cost approximately €10-15,000 plus septic tanks, pump sump and pump. Maintenance is also needed to cut back the willows on a three-year phased rotation (but the firewood you get out is then free!)

8. Examples of usage

Constructed wetland systems have been used throughout Ireland and elsewhere in the project region. Zero discharge willow facilities are commonplace in Denmark, and have recently been adopted in Ireland as a solution for sites of poor percolation.

Innovative Designs for Challenging Sites



Constructed wetland system

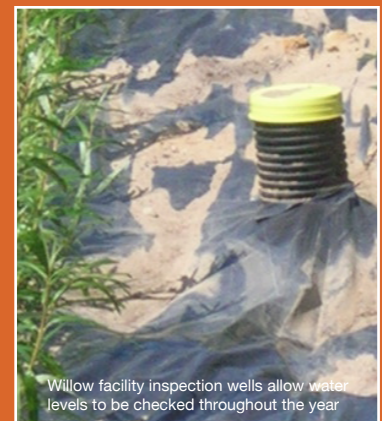
TREATMENT WETLANDS



Constructed wetland system



Zero discharge willow facility newly planted



Willow facility inspection wells allow water levels to be checked throughout the year

Wetland systems

Constructed wetland systems, reed beds and zero discharge willow facilities. Secondary and tertiary sewage treatment systems; and zero discharge sewage management option in the case of the willow facilities

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