



Waste water treatment on the Rousdon Estate

Drainage on the Rousdon Estate is by septic tank and filter beds draining into a reed bed, which are owned and maintained by Allhallows Limited. With this type of system it is extremely important to avoid flushing the usual 'foreign bodies' down the loo and introducing non-dispersible material and chemicals into the system. This note explains some of the mysteries of reed beds for effluent treatment.

Reed Beds

Reed beds are increasingly popular for the treatment of both industrial and domestic effluents, offering a simple, robust and cost-effective means of waste-water treatment. Reed beds have been applied to the treatment of domestic effluents in rural communities, where the relatively small volumes of effluent may mean that conventional systems are not cost-effective.

They are also seen as 'green' water treatment technology, fitting in with the landscape and having ecological added value, through sustainability and by providing habitats for wildlife. In addition they have significantly reduced operational costs compared to a conventional biological effluent treatment system.

How do they work?

Reed beds have a high degree of physical, chemical and biological complexity. The treatment of effluent is achieved by a combination of the action of micro-organisms, the physical and chemical properties of the solid media and the reeds within the reed bed. The micro-organisms are the most important players in the treatment of effluents, utilizing the organic compounds present as a source of nutrition. The activity of the micro-organisms is influenced by both the reeds and the solid media. Reeds survive in the waterlogged conditions of wetlands by transferring oxygen to their roots. This oxygen is utilized by the micro-organisms in the reed bed in their chemical action. Root growth also restructures the solid media maintaining channels through the bed. Furthermore, due to their spatial complexity, both aerobic (oxygen-rich) and anaerobic (oxygen deficient) conditions will exist in reed beds. This variation in conditions throughout the system results in a high diversity of microorganisms, improving the biological treatment capacity of the system.

What are the benefits of reed beds?

Reed beds have relatively low operational costs compared to conventional biological treatment systems. As flow through the system is governed by gravity, there are no requirements for pumping once the effluent is in the reed bed. Similarly, as aeration is facilitated by the reeds, there is no requirement for blowers to aerate the system. As such, there are no mechanical or electrical requirements



Reed beds do not produce sludge, a significant problem in the operation of conventional biological systems. Due to the 'low tech' nature of reed beds, there is no requirement for highly trained operators. As the degradation of the organic content of the effluent occurs within a solid matrix, it should be free from odour.

As reed bed systems have a high diversity of microorganisms they have high adaptability to both concentration and content of effluents. They may adapt to diverse types and varying shock loads of effluents, including difficult waste-water containing organic compounds, such as chlorinated hydrocarbons, dyes and sulphur containing aromatics and heavy metals and pathogens. Additionally, pollutants will be captured, transformed or removed by physical (e.g. filtration) and chemical (e.g. precipitation) routes. For example, metals may be immobilised by cationic bonding with the solid matrix or by uptake into the reeds themselves.

Our reed bed system on the Rousdon Estate needs minimal maintenance: cutting the reeds down once per year in the winter, removal of debris from the reed bed and material from the filters.

However...

This is a biological treatment system and needs to be treated with respect. It is important to ensure that non-biodegradable materials and toxic fluids are not introduced into the drains. Also it is important not to overload the system because the response to pollutants may take time as the biochemistry adapts. All these things will increase maintenance costs and regular bills for Estate residents and owners will rise. So here we reiterate the guidelines given to owners and guests in the ROAR Welcome Pack and published in earlier editions of the 'Rousdoner'

Don't allow nappies, sanitary towels, tampons, condoms, rags, non-toilet tissues and paper, or anything other than toilet tissue to be flushed down the loo.

Don't put non-dispersible items such as neat disinfectant, bleach, petroleum fluids, fats, oils, or any chemicals down sinks or allow them to enter drains.

Most supermarkets sell 'Ecover' or similar toilet cleaners, spray cleaners, and washing products for washing machines and dishwashers. These are suitable for use with septic tanks and the estate drainage system. Please ensure that you use them.

Mary Blick

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(December 2014)