

Technical Note

Project No 13784: Wern Farm, Tredunnoch, Usk NP15 1PE.

Date: March 2022

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Subject: Foul Water Drainage and Phosphate Review

1.0 Introduction

1.1 The purpose of the Technical Note is to provide an understanding of Vale Consultancy's design approach and the principles of the planning requirements in respect of the private sewerage design for Wern Farm. It sets out how the design complies with Welsh Government Circular 008/2018 and the NRW regulatory position on the phosphate standards of water quality conditions for rivers, which will underpin the choosing of the right sewage treatment and disposal method and foul water drainage scheme to support the development aspirations.

1.2 The Welsh Government Circular **008/2018** in the assessment of sewerage proposals for any development is that the first presumption must always be to provide a system of foul drainage discharging into a public sewer unless it can be demonstrated that it is not feasible on the grounds of cost and/or practicability.

2.0 Background

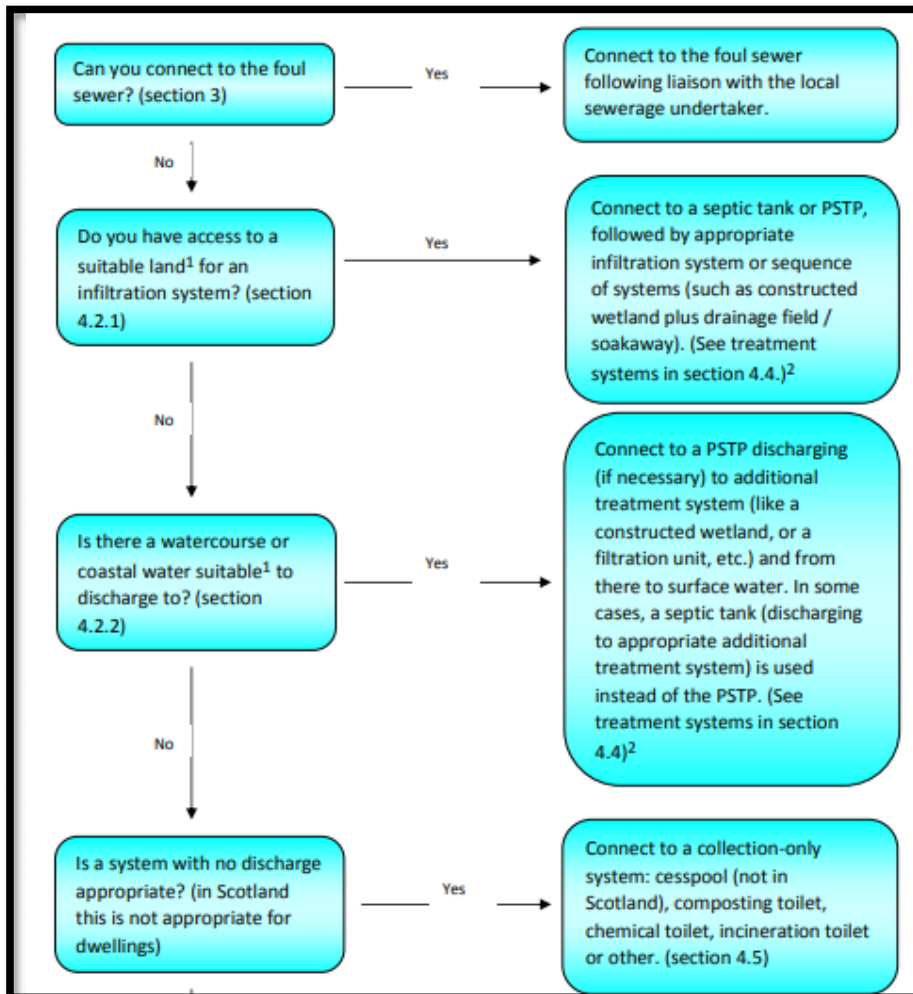
2.1 The application site boundary which measures 0.04 ha is set within a plot of land situated within Wern Farm, Tredunnoch, Usk.

2.2 The development proposals involve the refurbishment of two existing farm barns in to holiday let accommodation. There are currently no foul water flows from the existing building and the refurbishment will include kitchen and waste facilities increasing the foul flows from the development.

2.3 This site is within the Phosphorous Sensitive Catchment Area of the River Usk and NRW guidance requires that all development within the can demonstrate phosphate neutrality or betterment.

2.4 Foul water discharge options have been considered in line with the WAG circular 008/2018 and summarised on the following flow chart:

Flowchart of wastewater discharge options for the site:



3.0 Connection to Public Sewer

3.1 Asset records have been obtained from Dwr Cymru Welsh Water (DCWW) which indicates there is no foul or combined asset with the vicinity of the development and no public sewerage system exists within **30mtrs vicinity of the candidate site**, a direct connection to the sewerage system either by a gravity pipe conveyance or for part of the route that cannot be drained by gravity pumping may be required. The route to the nearest public sewer would involve crossing third party intervening land ownership and that sewer requisition under the provisions of Section 98-101 of the Water Industry Act 1991 would prove to be an arduous process in terms of the legal, financial (construction cost and landowner compensation costs) and time in delivering an appropriate foul water sewer to serve the building.

3.2 The provision of a private pumping station to serve the development proposals is not a cost-effective solution and should be avoided when considering the initial capex, the lifetime operational costs of the ongoing energy and maintenance requirements and the risk associated with failure. The solution of providing a non- mains solution can be delivered more cost -effectively

3.3 As there is no public sewer within 30m of the site therefore is not a feasible option.

4.0 Consideration of site-specific types of wastewater treatment systems

4.1 The wastewater emanating from the development will be disposed of in order of preference as follows:

Priority Level 1: Packaged Waste Water Treatment Plant

Priority Level 2: Septic Tank.

Priority Level 3: Cesspit

4.2 Package sewage treatment plants (PSTP)

4.2.1 PSTPs are made of prefabricated components that can be installed underground, with minimal work, on the r site. There are various designs of PSTPs, all provide secondary treatment of the wastewater; some designs also provide primary treatment, and some tertiary treatment.

4.2.2. PSTPs are appropriate for incoming wastewater with a steady flow. If the flow is variable, an additional balancing system is required. They usually require a power supply to operate. While the system operates, sludge accumulates in it. The site where a PSTP is installed must allow access by tanker, to regularly remove excess sludge.

4.2.3. The siting of a PST should be positioned at least 10m from a watercourse and a building (Bldg Reg Part H .1:54)

4.2.4. A PST needs a steady flow of sewage to keep the micro-organisms alive and to operate most effectively. The proposed development will generate erratic wastewater loads and there would be the requirement of a flow balancing system.

4.2.5 The disposal of treated effluent to a drainage field has been discounted due to spatial constraints of the development.

4.2.6 There are no surface water assets, including and sewer or ditches with the vicinity of the development that would be suitable or practical to discharge effluent flows too.

4.3 Septic tanks

4.3.1. A septic tank is a watertight underground settlement tank, with inlet and outlet pipe and two or more chambers, which provide primary treatment of the wastewater.

4.3.2. A septic tank treats both steady and variable wastewater flows and does not require power supply.

4.3.3. A septic tank may be installed to discharge (indirectly) to ground: its treated effluent going to an infiltration system and from there to ground

4.3.4. It may be considered for discharging (in most cases indirectly) to a watercourse or coastal water: via an additional system like a reed bed, gravel filter or even a PSTP, and from there to surface water.

4.3.5. While the system operates sludge accumulates in it. The site where the septic tank is must allow access by tanker, to regularly remove excess sludge.

4.3.6. The siting of a septic tank should be at least 7m from the building and the drainage field at least 15 m from the building (Bldg Regs Part H 1.16,1.27)

4.3.7. To discharge treated effluent to the ground, you must have access to a suitable area of land, and within the sites Red Line boundary the spatial constraints are restricted for this layout configuration.

4.3.8. In determining if the site is suitable and large enough a preliminary ground assessment by a trial pit, to determine percolation and the seasonally highest level of the water table and type of soil, established that a drainage fields/ soakaways associated with a septic tank to spread the effluent across the drainage field which would consists of a piped infiltration systems of various designs consisting usually of a series of perforated pipes buried underground in trenches filled with clean gravel or broken stone, on a slight gradient away from the inlet.

4.3.9. The area of land required determines that it is not feasible and reasonably practical to proceed with that option of a PTP or septic tank.

4.4 Cesspool

4.4.1. A cesspool is a sewage watertight holding tank with no outlet. Sewage flows in and is stored when the tank is full the waste is tankered away.

4.4.2. A cesspool should be at least 7m from the building, and will have an exhaust or vent pipe and a high-level alarm.

4.4.3. Due to the spatial constraints in providing a well-defined area of ground (drainage field) designed to allow liquid to drain into the surrounding soil and the infrequent use of the building then a cesspit is the most cost-effective option,

4.0 Conclusion

Drainage principals have been designed in accordance with eh WAG circular 008/2018

Development flows are predicted the be less than 2m³ per day.

It is concluded that the only viable option for this site is the use of a Cesspool

The Cesspool should be installed a min for 7m from any habitable dwelling and provide access for a suitably sized tanker

The development will not a have a negative impact on the phosphate levels of the River Usk.