

# Kerry County Council

## On-Site Wastewater Treatment Systems

### Guidance Information on the Assessment and Submission of Site Characterisation Data

#### 1. Introduction

This guidance note has been prepared to provide assistance to planning applicants and agents on the use of site characterisation data for the selection and design of on-site wastewater treatment systems.

The information contained in this note is primarily based on the guidance provided in the EPA Wastewater Treatment Manual “Treatment Systems for Single Houses”, published in 2000, which should be consulted for any detailed information on any of the issues covered in this note. The manual also contains details of the various types of wastewater treatment systems available. It should be noted that the EPA manual is currently undergoing a detailed review and any revised version of the manual will obviously take precedence over the guidance provided in this information note.

Additional information on aspects of on-site wastewater treatment is also available in two further documents, namely :

- EPA Wastewater Treatment Manual “Treatment Systems for Small Communities, Business, Leisure, Centres & Hotels” (EPA, 1999), and;
- “Groundwater Protection Schemes” (DoEHLG/EPA/GSI, 1999).

While this note relates primarily to planning applications for single houses, many of the issues covered are also of relevance to multiple-house or commercial/leisure type developments. The assessment of these types of developments follows a similar format, however, the scale of assessment (eg. no. of trial hole and percolation tests required etc.) may be different to that for single houses. In particular, applicants for larger-scale developments involving the proposed installation of a centralised or combined treatment system should refer to the information contained in **Section 6** and **Appendix 1** of this note for details of the site assessment information required at planning stage for such developments.

## **2. Purpose of the Site Assessment Process**

The suitability of any site for on-site wastewater treatment is ascertained by carrying out a standard range of tests and assessments (as set out in the EPA manual). Two issues must be addressed as part of this exercise :

1. Is the site suitable for the installation and operation of a wastewater treatment system capable of achieving the required level of treatment?
2. Is the site suitable for the disposal of treated wastewater effluent?

The results of the site assessment process should be used to determine the suitability of the site for on-site wastewater treatment and the subsequent disposal of treated effluent. This information will also be used to assist in the design of any proposed treatment system.

In theory, it should be possible to identify a suitable treatment system for most site conditions. Difficulties may arise, however, with the issue of effluent disposal. This is particularly the case on sites with poor percolation characteristics (ie.  $T > 50$ ) and/or with a high water table where ponding of effluent at groundlevel may arise. Planning applicants must clearly demonstrate, by reference to the results of the site assessment process, that both of these issues have been adequately addressed at the planning stage.

## **3. Submission of Site Assessment Information**

All sites proposing the use of on-site wastewater treatment must be thoroughly assessed in line with the procedures outlined in the relevant EPA manual. Details of the information gathered during the site assessment process must be submitted at the planning application stage. The standard site characterisation form must be used to record this information and a completed copy of the form must always accompany the planning application. It should be noted that applications for multiple-house schemes, where it is proposed to provide an individual treatment system for each house, must be accompanied by an individual site assessment report for each individual site. The submission of a single assessment form in such circumstances will not be accepted.

Failure to satisfactorily complete the form, or the submission of inadequate information may result in delays in the planning process. In particular, general statements such as  $T > 50$  should not be included, instead a true and accurate figure must be submitted (eg.  $T = 100$ ) along with full details of the percolation tests carried out as outlined in section 3.3 of the standard form (eg. depth of hole, start times, finish times etc.).

Where possible, a standard percolation test (T-Test) should always be carried out on a site. There may, however, be certain instances where a T-Test cannot be undertaken; for example, sites with high water table and/or with high bedrock. In such circumstances, a P-Test should always be carried out.

In certain rare circumstances, it may not be possible to carry out either a T-Test or a P-Test, due to an extremely high water table and/or high bedrock. Such sites are unlikely to be suitable for on-site wastewater treatment.

**Note :** In circumstances where a T-value is in excess of 50 ( $T > 50$ ), a P-Test should always be carried out. Where T is less than or equal to 50 ( $T \leq 50$ ), there is no specific requirement to carry out a P-Test.

#### **4. Selection of an Appropriate Wastewater Treatment System**

Detailed guidance is provided in the various EPA manuals on the various treatment options available for a range of site conditions. A brief summary of some of the options available for single houses for a number of typical site conditions is outlined in **table 1** of this note. The list is not exhaustive and alternative options may also be available in some instances. It is important to note, however, that any proprietary wastewater treatment plant proposed for a single house development should have full and current agreement certification.

The treatment options available for larger schemes are outlined in detail in the EPA Manual “Treatment Systems for Small Communities, Business, Leisure Centres and Hotels.”

#### **5. Disposal of Treated Wastewater Effluent**

Treated effluent is typically disposed of by way of discharge to groundwater by percolation. The suitability of any site for the disposal of treated effluent is generally assessed by referring to the site assessment data obtained for the site in question. The full range of information available should be consulted in detail and a recommendation should be made as to the suitability of the site for the disposal of treated effluent. Particular attention should be paid to the results of both the percolation tests and the trial hole tests carried out on the site. A series of different scenarios are outlined below for a range of possible site conditions – a synopsis of the information given below is also provided in **table 1** of this note.

##### **Scenario 1 ( $T \leq 50$ )**

Sites with a T-Value less than or equal to 50 ( $T \leq 50$ ) are considered potentially suitable for the discharge of treated wastewater effluent to groundwater (ie. by percolation). In such circumstances, there is no specific requirement to carry out a P-Test.

A T-value less than 1 ( $T < 1$ ) would indicate that the site in question has a high rate of percolation available. This may pose a risk of contamination to groundwater and careful consideration should be given to the level of treatment to be achieved prior to discharge.

Options to be considered could include the construction of a suitable percolation area or polishing filter.

### **Scenario 2 (50<T≤90)**

Sites with a T-value in excess of 50 but less than or equal to 90 may be potentially suitable for the discharge of treated wastewater effluent to groundwater. In such circumstances, a P-Test should always be carried out. Conventional septic tank systems should not be considered for such sites.

If the P-value is less than or equal to 50 (ie.  $P \leq 50$ ), then the site is potentially suitable for the discharge of treated wastewater effluent to groundwater. Permission for such discharges, however, would only be considered where, following careful consideration of all issues, a clear statement can be made by a suitably qualified person that the proposed discharge will not result in ponding of effluent on site.

Where the P-value is greater than 50 (ie.  $P > 50$ ), then substantial site works would be required to facilitate installation of a polishing filter. As above, the discharge of treated effluent to groundwater would only be considered in such circumstance where, following consideration of all issues, a clear statement can be made by the applicant, or his/her agent, that the proposed discharge will not result in ponding of effluent on site.

### **Scenario 3 (T>90)**

Sites with a T-value in excess of 90 are likely to be problematic for the discharge of treated wastewater effluent to groundwater. In such circumstances, a P-Test may be carried out, however, the long-term risk of ponding of effluent on such sites is high.

If the P-value is less than or equal to 50 (ie.  $P \leq 50$ ) and where significant additional or complementary hydrogeological analysis clearly indicates that the risk of ponding of effluent on the site will not arise, then consideration may be given to the discharge of treated effluent to groundwater in limited circumstances. Any analysis undertaken must clearly show that the rate of percolation available is sufficient to allow the discharge of treated effluent to ground without causing ponding.

If the P-value is greater than 50 (ie.  $P > 50$ ), then the site is unlikely to be suitable for discharge of treated wastewater effluent to groundwater.

### **Scenario 4 (Shallow Soils)**

The presence of a high water table and/or bedrock on a site may preclude the carrying out of percolation testing. In particular, it may be difficult or impossible to carry out either a T-Test or P-Test on sites where the water table and/or bedrock is less than 600mm below existing groundlevel. Such sites are generally unsuitable for on-site wastewater treatment and subsequent disposal of treated effluent to ground. Where installation of on-site drainage is proposed as a means of resolving the issue of high water table (in an attempt

to draw down the water table), the drainage system should be installed and the site re-assessed in advance of the planning application being submitted.

A site with water table or bedrock at depths between 600mm and 1200mm below existing groundlevel (classified as a shallow soil) is potentially suitable for on-site wastewater treatment and subsequent disposal of treated effluent to groundwater, however, appropriate percolation testing must be carried out and the results assessed accordingly. In addition, any potential seasonal fluctuation in water table levels should also be taken into account.

Where possible, a T-test should be carried out and the results assessed in line with the various scenarios outlined previously. Depending on the available depth of soil, however, it may not always be possible to carry out a T-Test satisfactorily. In such circumstances, a P-Test should always be carried out. If the P-value is less than or equal to 50 (ie.  $P \leq 50$ ), then the site is potentially suitable for the installation of a polishing filter and the discharge of treated wastewater effluent to ground. However, permission for such discharge would only be considered where, following careful consideration of all issues, a clear statement can be made by a suitably qualified person that the proposed discharge will not result in ponding of effluent on site. For sites with shallow bedrock, this should include analysis of the bedrock permeability. Where the P-value is greater than 50, the site is unlikely to be suitable for the discharge of treated effluent to groundwater.

### **Direct Discharge to Surface Waters**

The direct discharge of treated domestic wastewater effluent to surface waters (freshwaters) should generally not be considered for new developments. Specific legal targets with regard to the protection of water quality are in place and these have been further reinforced with the introduction of the EU Water Framework Directive. As part of the implementation process for the Directive, considerable work is currently being undertaken on the monitoring and assessment of water quality throughout the country, including County Kerry. Initial results from this have indicated that many water bodies, particularly smaller streams and rivers, may be at risk from pollution and, in light of this, Kerry County Council would only consider granting licences for the discharge of treated domestic wastewater effluent to surface waters in rare and exceptional circumstances.

This approach may be reviewed as and when new information and/or guidance arising from the monitoring and research work currently being undertaken as part of the Water Framework Directive implementation becomes available.

Further information on discharge licensing is available from **the Environment Protection Section, Kerry County Council, Maine Street, Tralee. [Tel. 066-7162000]**

## **6. Large-Scale Developments (Centralised Wastewater Treatment Systems)**

Information submitted in support of any planning application involving the proposed use of a centralised wastewater treatment systems must clearly show that the system in question is adequate for the satisfactorily treatment and disposal of wastewater.

The information provided on the proposed treatment system should include the anticipated loading, treatment capacity, full details of the proposed treatment plant etc. Details should also be provided on any proposed percolation area/polishing filter. It should be noted, however, that difficulties may arise with the distribution of effluent through gravity-fed percolation areas/polishing filters where large volumes of effluent are involved. Accordingly, the use of gravity-fed percolation areas/polishing filters may not be appropriate for systems in excess of approximately 25 P.E. (population equivalent). The use of pumped/pressurised systems should, therefore, be considered for developments in excess of this size.

Detailed information must also be provided on the method proposed for the disposal of treated effluent from the system. **It should be noted that discharges of treated effluent to groundwater may require licencing under the Water Pollution Acts. In particular, discharges of domestic effluent which exceed 5 cubic metres in any 24 hour period to an aquifer from a septic tank or other disposal unit, by means of a percolation or other method, require licencing under the Acts. Details of the information which would need to be submitted in support of planning applications in such circumstances is contained in appendix 1 of this document.**

## **7. Other Issues**

It is important that the separation distances as specified in table 4 of the relevant EPA manual (“Treatment Systems for Single Houses”) and in table 4 of the EPA manual (“Treatment Systems for Small Communities, Business, Leisure Centres and Hotels”) are adhered to. In particular, the guidance on separation distances from wells and springs should be strictly adhered to in order to avoid risk of contamination. This issue is of particular relevance where a spring or bored well is proposed as the source of drinking water for a development, and/or where a neighbouring or nearby property is making use of such a source. In such cases the applicant, or agent, should clearly illustrate that the appropriate separation distances can be achieved, taking account of issues such as slope, ground conditions etc. Further detailed guidance on this issue is provided in the GSI/DoE/EPA document “Groundwater Protection Schemes – Groundwater Protection Responses for On-Site Wastewater Systems for Single Houses.”

In circumstances where soil replacement or a mound system is proposed, additional percolation tests should always be carried out during the course of construction of the system. This requirement is in line with the recommendations contained in section 3.2.2. of the current EPA manual.

**Table 1**

<b>T-Test Result</b>	<b>P-Test Result</b>	<b>Potential Treatment Options (Single House)</b>	<b>Disposal Option for Treated Effluent</b>
T<1	P<=50	<ul style="list-style-type: none"> <li>• Alternative Septic Tank System*</li> <li>• Mechanical Aeration System + Polishing Filter</li> </ul>	Discharge to Groundwater
1<=T<=50	Not Required	<ul style="list-style-type: none"> <li>• Conventional Septic Tank System</li> <li>• Alternative Septic Tank System*</li> <li>• Mechanical Aeration System + Polishing Filter</li> </ul>	Discharge to Groundwater
50<T<=90	P<=50	<ul style="list-style-type: none"> <li>• Alternative Septic Tank System*</li> <li>• Mechanical Aeration System + Polishing Filter</li> </ul>	Discharge to Groundwater <sup>1</sup>
	P>50	<ul style="list-style-type: none"> <li>• Alternative Septic Tank System*</li> <li>• Mechanical Aeration System + Polishing Filter</li> </ul>	Discharge to Groundwater <sup>1</sup>
T>90	P<=50	<ul style="list-style-type: none"> <li>• Alternative Septic Tank System*</li> <li>• Mechanical Aeration System + Polishing Filter</li> </ul>	Discharge to Groundwater <sup>2</sup>
	P>50	<ul style="list-style-type: none"> <li>• Alternative Septic Tank System*</li> <li>• Mechanical Aeration System + Polishing Filter</li> </ul>	Site potentially unsuitable for discharge of effluent
Unable to carry out T-Test due to high water table and/or bedrock (Note : min. 600mm depth of suitable unsaturated soil must be present above WT and/or bedrock.)	P<=50	<ul style="list-style-type: none"> <li>• Alternative Septic Tank System*</li> <li>• Mechanical Aeration System + Polishing Filter</li> </ul>	Discharge to Groundwater <sup>1</sup>
	P>50	<ul style="list-style-type: none"> <li>• Alternative Septic Tank System*</li> <li>• Mechanical Aeration System + Polishing Filter</li> </ul>	Site potentially unsuitable for discharge of effluent

1 – Only allowable where the applicant can provide a report clearly stating that the proposed discharge will not result in ponding of effluent on site.

2 – Only allowable where a detailed hydrogeological analysis has been undertaken which clearly shows that the rate of percolation available is sufficient to allow the discharge of treated effluent without causing ponding on site.

\* – Alternative Septic Tank System = Septic Tank + Intermittent Filter and/or Constructed Wetland + Polishing Filter. (Septic tank + constructed percolation area may also be possible in some instances.)

## **APPENDIX 1**

### **ON-SITE WASTEWATER TREATMENT**

#### **ASSESSMENT INFORMATION REQUIRED FOR LARGE SCALE HOUSING DEVELOPMENTS (CENTRALISED WASTEWATER TREATMENT SYSTEMS)**

The site assessment information required at the planning application stage for developments of a scale larger than single house developments is as outlined below. The requirements vary according to the scale of the development proposed and are divided into two distinct categories as follows :

#### **Treatment Systems where the Proposed Discharge Does Not Exceed 5m<sup>3</sup> in a 24 Hour Period (Approximately Equivalent to a Design P.E. of less than 25)**

- The site assessment process should be undertaken as outlined in the EPA manual “Treatment Systems for Single Houses” and the relevant information recorded and submitted in the format provided on the standard site characterisation form.
- The on-site evaluation procedure as outlined in chapter 2 of the EPA Manual “Treatment Systems for Single Houses” (visual assessment, trial hole and percolation testing) should be undertaken for every 150 square metres of percolation area/polishing filter proposed, or part thereof.

[eg. for a soil polishing filter of area 550 square metres, 4 sets of on-site tests should be carried out.]

#### **Treatment Systems where the Proposed Discharge Exceeds 5m<sup>3</sup> in a 24 Hour Period (Approximately Equivalent to a Design P.E. in excess of 25)**

- As above, the site assessment process should be undertaken as outlined in the EPA manual “Treatment Systems for Single Houses” and the relevant information recorded and submitted in the format provided on the standard site characterisation form.

- The on-site evaluation procedure as outlined in chapter 2 of the EPA Manual “Treatment Systems for Single Houses” (visual assessment, trial hole and percolation testing) should be undertaken for every 150 square metres of percolation area/polishing filter proposed, or part thereof.

In addition to this, however, a detailed hydrogeological report should also be prepared and submitted in support of the application. This report, which should be prepared by a suitably qualified person, must include a detailed hydrogeological assessment of the site containing details of the following :

- An aquifer classification (ie. whether the aquifer in question is considered regionally important, locally important etc.),
- An assessment of groundwater vulnerability on the site (expressed as a vulnerability rating – extreme, high, moderate, low);
- Details of any groundwater supplies in the vicinity of the site (both public and private);
- An assessment of existing groundwater quality on the site and the likely impact of the proposed development on groundwater quality. As part of this process groundwater quality analysis should be carried out for the following range of parameters :  
**Coliforms (both faecal and total), E-coli, Electrical Conductivity, pH, Ammonia (as ammonium), Chloride, Nitrate (as NO<sub>3</sub>), Nitrite (as NO<sub>2</sub>), Orthophosphate, Potassium, Sodium, Sulphate, Copper, Zinc, Lead.**

The report should indicate, based on a thorough assessment of the data gathered, whether ground conditions on the site are suitable for the discharge of effluent without causing adverse impacts on groundwater quality generally (reference should be made to the Interim Guideline Values produced by the EPA, or to any subsequent or amending values) and, in particular, without causing adverse impacts on any groundwater supplies in the vicinity of the site.

The report should also indicate whether ground conditions on-site are suitable for the proposed discharge of effluent to groundwater without resulting in ponding or flooding on the site or in its vicinity.

*[N.B. - It should also be noted that, in addition to planning permission being obtained, a discharge licence under the Water Pollution Acts would also be required in such instances. Details of the licence application procedure are available from the Environment Protection Section, Kerry County Council, Maine Street, Tralee – Tel. (066) 7162000.]*

**Kerry County Council,  
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