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# Site Assessor's Guide

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Information to  
support One-Off  
House Planning  
Applications

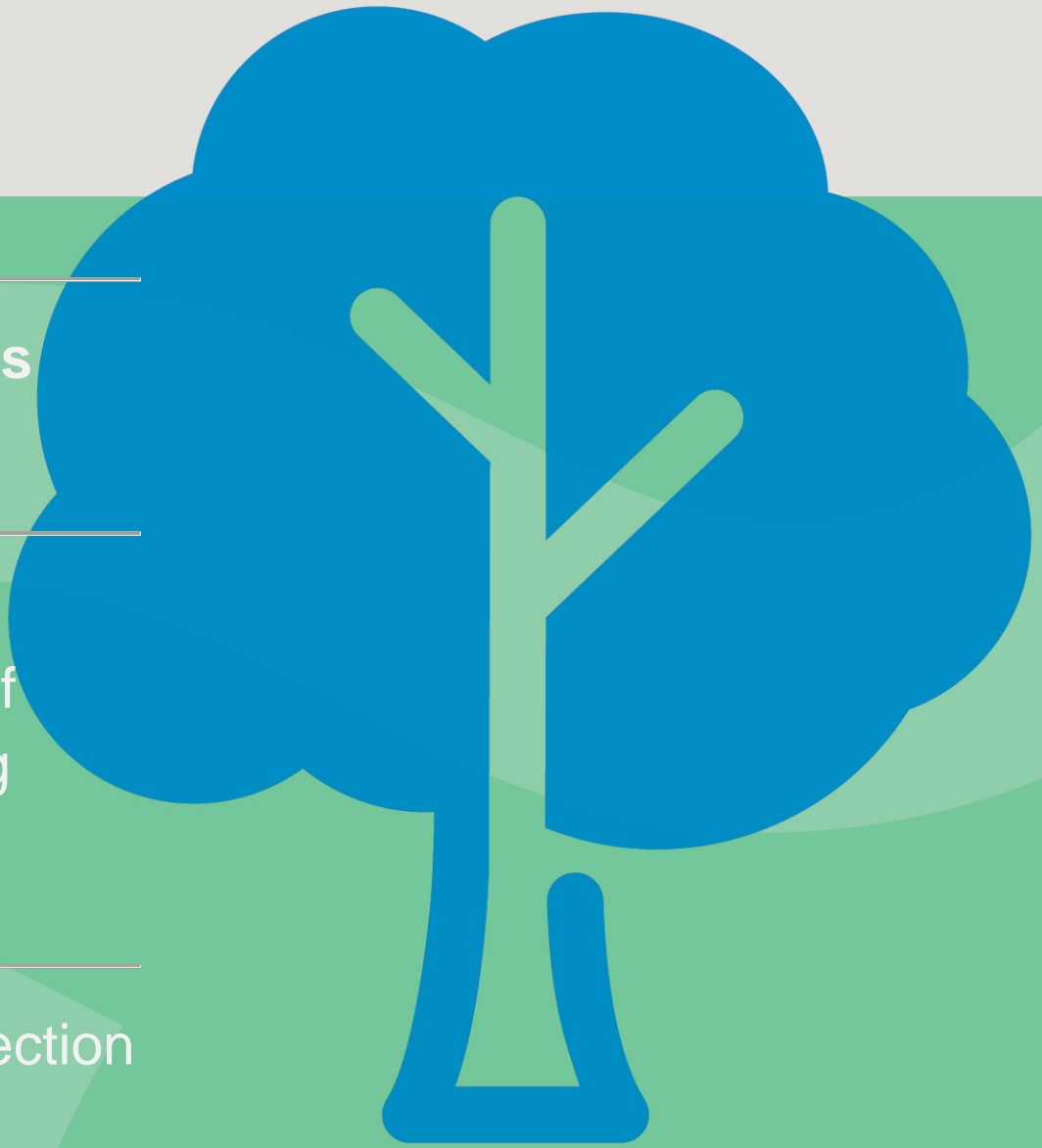
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Environment Section

July 2015

Version 1.0

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## 1. Introduction

The *Site Assessor's Guide* (Guide) has been prepared by Tipperary County Council (TCC) Environment Section in conjunction with TCC Planning Authority.

The primary aim of the Guide is to ensure that on-site wastewater treatment systems for one-off housing development in Tipperary are appropriately sited and designed at planning application stage. The Guide will also help to improve and streamline the Planning Application process for Site Assessors and the Local Authority by reducing or eliminating the need for further information and will also facilitate quicker and better planning decisions by the Planning Authority.

The Guide should be read in conjunction with the EPA's **Code of Practice: Wastewater Treatment and Disposal Systems Serving Single Houses 2009** (CoP) (<http://www.epa.ie/pubs/advice/water/wastewater/>).

## 2. Principles of On-site Wastewater Treatment

### 2.1. Site Suitability Assessment

The purpose of Site Suitability Assessment (SSA) is to ensure that wastewater can be treated and disposed of within the site boundaries, without resulting in a risk to human health or the environment. SSA is a Source-Pathway-Receptor environmental risk assessment (see Figure 1 Source-Pathway-Receptor showing a typical S-P-R model applicable to on-site wastewater treatment). The SSA will assess if the site is suitable for the treatment of domestic effluent so that the wastewater (hazard/source) will not travel either too quickly or too slowly through the pathway (soil/rock) to any nearby receptors (wells, rivers, streams, human beings etc).

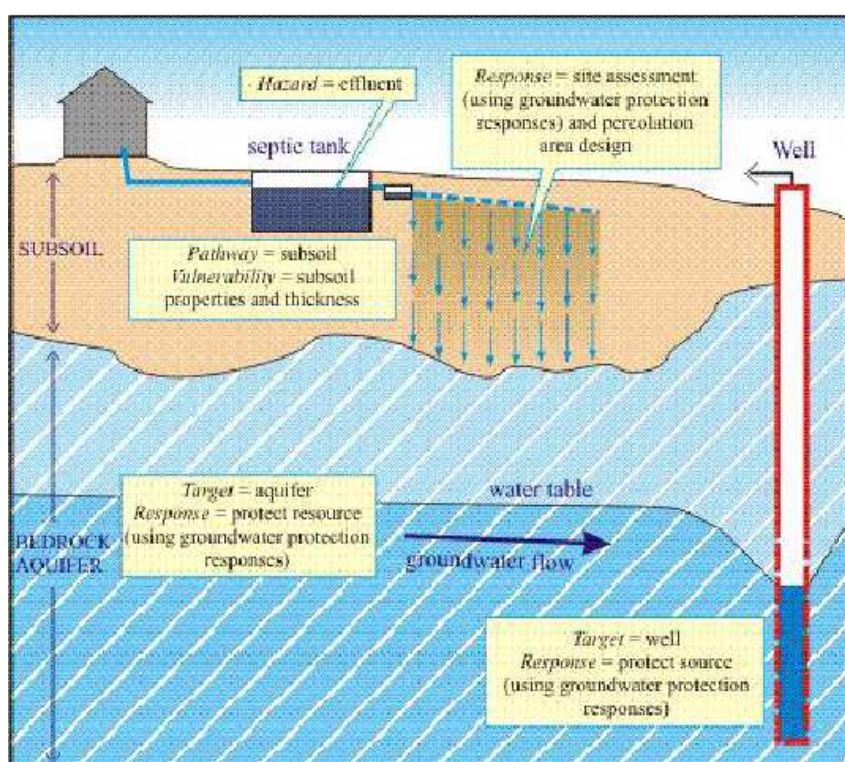


Figure 1 Source-Pathway-Receptor Model applicable to OSWTS

## 2.2. Types of On-Site Wastewater Treatment Systems

There are two types of domestic wastewater treatment systems:

- septic tanks with percolation areas
- secondary treatment systems with polishing filters

## 2.3. Principles of Effective Treatment

Effective effluent treatment capacity of soil depends on:

- **soil combination** (< 2mm diameter particle size) i.e. sand/ silt/ clay
- **sufficient depth** of percolation
- **permeability** of the soil

Note. Excessive rock/stone content in underlying soil layers do not contribute to effective effluent treatment irrespective of T/P values.

## 3. Roles and Responsibilities of the Site Assessor and the Local Authority

### 3.1. Role of the Site Assessor

A site assessment is carried out by a suitably qualified and experienced Site Assessor. Both the applicant and the Planning Authority are relying on the Site Assessor's expert judgement to fully assess the site and to make an appropriate recommendation, guided by the CoP. The Site Assessor will:

- a) Identify if the site is suitable for waste water treatment
- b) Decide where on the site the waste water treatment system will be located
- c) Design an appropriate waste water treatment system

### 3.2. Role of the Local Authority

The role of the Local Authority is to evaluate the site suitability assessment, the wastewater treatment design and the application supporting information completed by the Site Assessor. The Local Authority when evaluating this information will check that the Site Assessor's proposals adhere to fundamental environmental principles as contained in the CoP, having regard to the features of the site and the site's context.

## 4. Existing House Applications Upgrade/Extension

### 4.1 New House Applications on Greenfield Sites

The full requirements of the CoP will apply, in the case of new one-off house applications on green-field sites.

## 4.2 Existing House Upgrade/Extension Applications

Where an applicant is applying for permission to extend or renovate an existing house, please note the following:

- a) Where the dwelling is to be substantially upgraded and/or extended, the applicant will be required to demonstrate that the existing domestic effluent treatment system is or is not adequate and in the event that it is not adequate to identify remedial measures to ensure the system does not present a risk to human health or the environment. The owners of an on-site wastewater treatment system have an ongoing duty of care and a responsibility to ensure that their system is fit for purpose, operating and maintained appropriately and is not causing environmental damage.<sup>1</sup>
- b) As part of the planning application for such a development, a Site Assessor's report should be submitted confirming:
  - the type of system that exists (i.e. septic tank or other to percolation area/filter/soak-away area)
  - the approximate capacity of the tank system versus the occupancy rating
  - that the system can be legally accessed and maintained (location to be shown on the site layout drawings) i.e. in applicant's ownership or way-leave available.
  - clean roof/surface water is not entering the system
  - that there is no visible evidence of the system causing a risk to human health or the environment i.e. no ponding on the ground in the vicinity of the system, no effluent break-out at slopes, no "by-pass" pipe to a nearby drain and that any drains in the vicinity are clear with no build-up of sewage fungus etc.
- c) where an upgrade to an existing system is required, compliance with the CoP is desirable. The Planning Authority may consider however a net improvement, where full compliance is not possible, that will offer the highest level of protection to human health and the environment. All designs must be proposed and justified by the Site Assessor.

## 5. Site Selection and Site Characterisation

### 5.1 Desktop Assessment

- a) The Site Assessor should be aware of previous site assessment results in the area, which may help to inform if the site or immediate area is likely to be suitable for on-site waste water treatment.
- b) The locations of public and group water schemes and **Groundwater Protection Zones** are available (<http://spatial.dcenr.gov.ie/GeologicalSurvey/Groundwater/index.html>) and are being updated regularly. If in doubt about a Groundwater Protection Response, consult with the District Planner or the Environment Section Executive Engineer (Nenagh office) or Executive Scientist (Clonmel office), as applicable, in advance of submitting an application.

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<sup>1</sup> See *Water Services Acts 2007 and 2012* and

## 5.2 Visual Assessment

- a) Identify vulnerable receptors and ensure separation distances (see CoP) are met.
- b) The **Groundwater Flow Direction** stated in Section 3.1 of the SCF must reflect the slope of the site under the proposed percolation area.

## 5.3 Trial Holes

- a) Take note of the aquifer class and ground slope and ensure the **trial hole depth** is sufficient to reflect a recommendation that can be substantiated e.g. a 3m trial hole is required for regionally important aquifers with extreme vulnerability.
- b) The **location of the trial hole** should be outside the footprint of the proposed percolation area (see Figure 2 Location of T and P Test Holes).

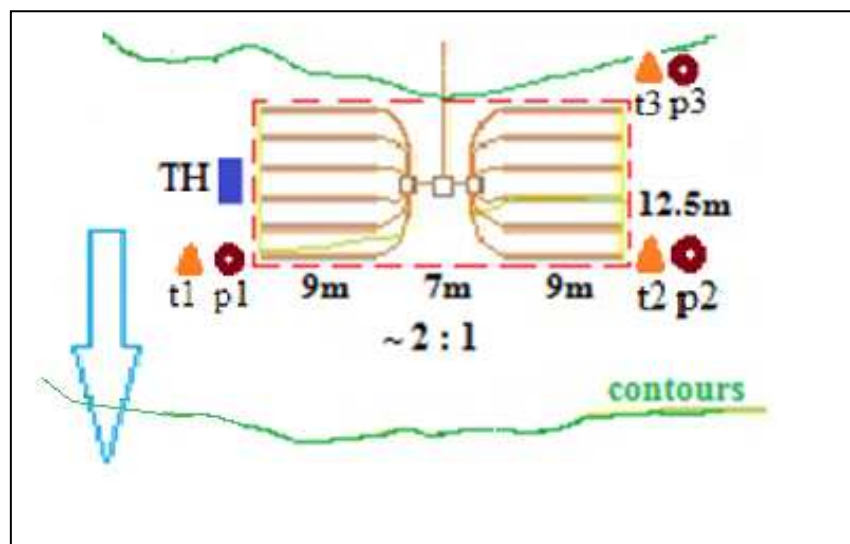
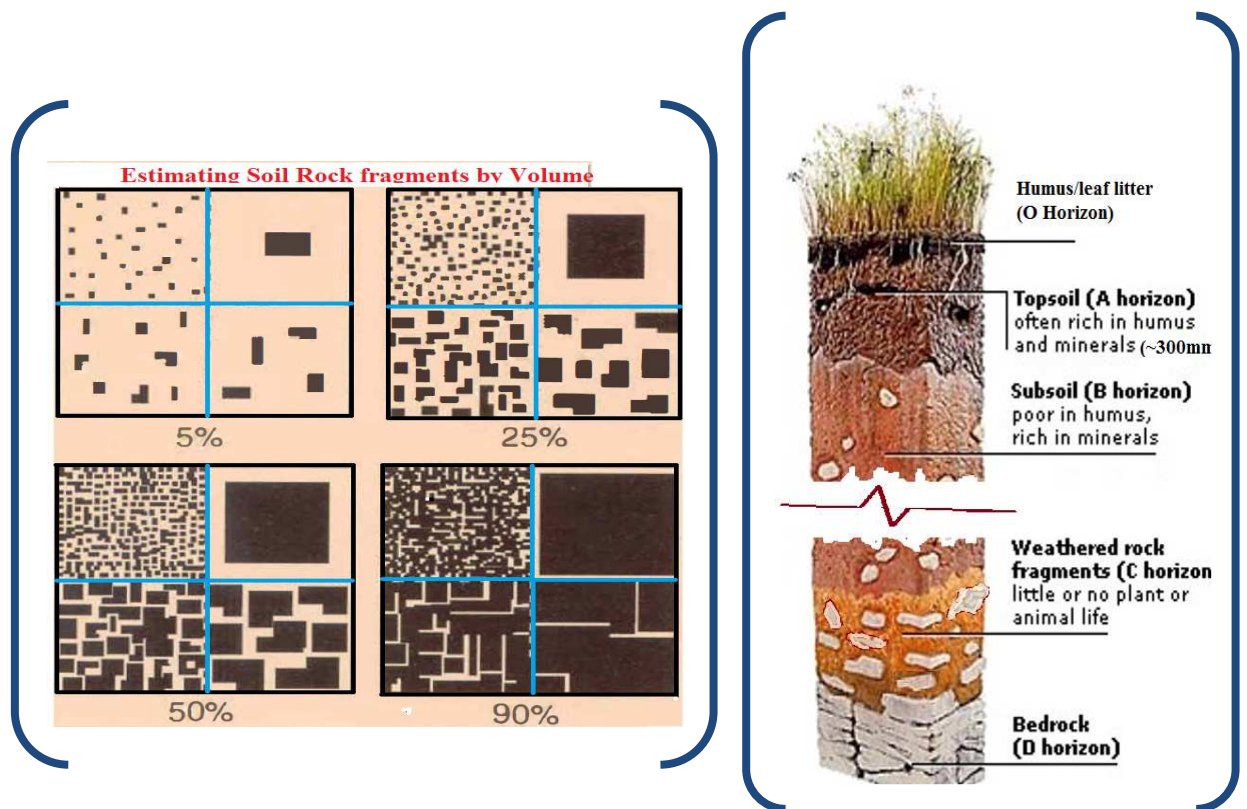


Figure 2 Location of T and P Test Holes

- c) **“Suitable soil”** contains certain fractions of sand, silt and clay that has the capacity to both filter and treat effluent before release into the environment i.e. groundwater. The soil must be unconsolidated and unsaturated and form a coherent body of soil, generally free from impediments such as short-circuiting flow-paths and excessive rock fragments etc. The **depth of “suitable soil”** required for percolation beneath the trench/stone distribution layer invert is:
  - 900mm minimum for a secondary treatment system/package plant
  - 1200mm minimum for a septic tank system
- d) Take care to reference the presence of **rock** correctly.
  - i. Bedrock is interpreted as solid/ fractured bedrock.
  - ii. Excessive rock/gravel fragments can occur as a discrete layer within a soil profile or may form part of the weathered bedrock above the competent bedrock layer. In either case, such layer containing greater than 20% by volume fragments should not be treated as “suitable soil” for wastewater treating purposes. (see Figure 3 Tool for Estimating % of Soil Rock Fragments by Volume). Note that excessive rock/stone content in underlying soil layers do not contribute to effective effluent treatment irrespective of T/P values



**Figure 3 Tool for Estimating % of Soil Rock Fragments by Volume**

- d) Where **rock is close to the surface**, the potential for groundwater contamination is high, so look out for signs of outcropping rock in the surrounding area and boulders within the excavated trial hole material. Reflect these findings in the Site Suitability Assessment Report.
- e) The **Soil Profile Log** should bring all the above details together and illustrate the following (see Figure 4 Trial Hole and Percolation Pipe Depths):
- Soil layers in the trial hole from ground to the identified depth
  - Depth of the top of the P and T test pits (1200mm or 1500mm); the bottom level of the depth of “suitable soil” is required to be identifiable.
  - Check that the “suitable soil” depth is free of water-table, bedrock, mottling, excessive rock/stone fragments and other impediments.

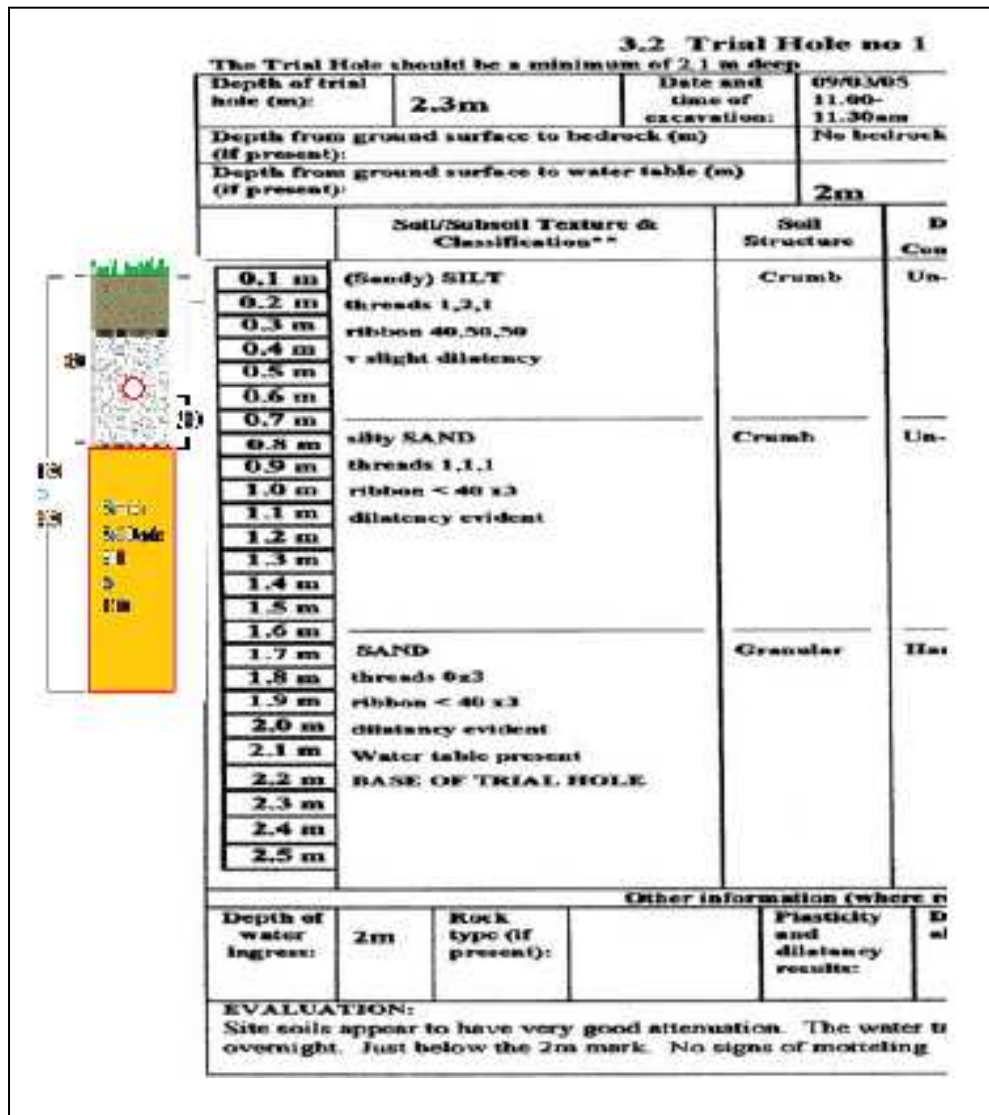


Figure 4 Trial Hole and Percolation Pipe Depths

#### 5.4 Percolation P and T Tests

- In order to fully characterise and ascertain the representative nature of the soil of the entire percolation area, it is critical that **both the T and P test values** are determined and reported in the Site Characterisation Report.
- The **location of P and T test holes** should be at the outside corners of the footprint of the proposed percolation area (see Figure 2 Location of T and P Test Holes).

#### 5.5 Site Characterisation Form

- Complete all parts of the **Site Characterisation Form** fully and accurately. If a report is incomplete or where inconsistent information is submitted, a request for further Information or supervised retesting may be required or a refusal of permission may issue.

#### 5.6 Unsuitable Test Location/Site

- If the test location is not suitable, the Site Assessor should either find another location on the site or identify an alternative site in the area.



## 6 Wastewater Treatment Design

Once the Site Assessor has fully characterised the site conditions, identified vulnerable receptors (e.g. wells, streams etc) and any limiting factors on the site (such as soil depths, depth to bedrock, slope, site boundaries etc) the Site Assessor can select and design the wastewater treatment proposal that is most suitable.

### 6.1 General

Having regard to the design proposals, please note the following:

- a) The design proposals must be **clearly presented** in plan and section drawings so that they can be easily understood by:
  - i) Any member of the public viewing an application
  - ii) the client and any engineer/builder responsible for constructing the treatment system and who would be relying on any subsequent permission to ensure correct implementation. Note there is no guarantee that the Site Assessor/Agent will be the one implementing the recommendations.
- b) Refer to the **Groundwater Protection Responses** (Annex B.5 of the CoP) and comply with the minimum requirements.
- c) In advance of the planning application being made, the Site Assessor should ensure that the householder is made aware of the **operational and maintenance requirements** associated with the particular system recommended, in particular the requirements for de-sludging and maintenance of pumps and other mechanical parts.

### 6.2 Soil Cover and Depth

- a) See Figure 5: **Soil Cover above and Soil Depth below** Percolation Drains. In relation to all wastewater treatment systems that involve percolation drainage trenches, it is critical that trenches are not laid too deeply below ground level. While such depth should be limited to the range 850mm to 1350mm, an ideal depth would be 1000mm, which allows for 600mm cover to the drains as per Building Regulation requirements, while also providing optimum depth for soil oxygenation purposes.
- b) The **cover provided above the percolation drains** should range between 450mm (minimum) and 950mm (maximum). The desirable minimum cover above the percolation drains is 600mm.
- c) 300mm depth of **stone fill** should be provided under percolation drains.
- d) The **depth of "suitable soil"** required for percolation is:
  - 900mm minimum for a secondary treatment system/package plant
  - 1200mm minimum for a septic tank system

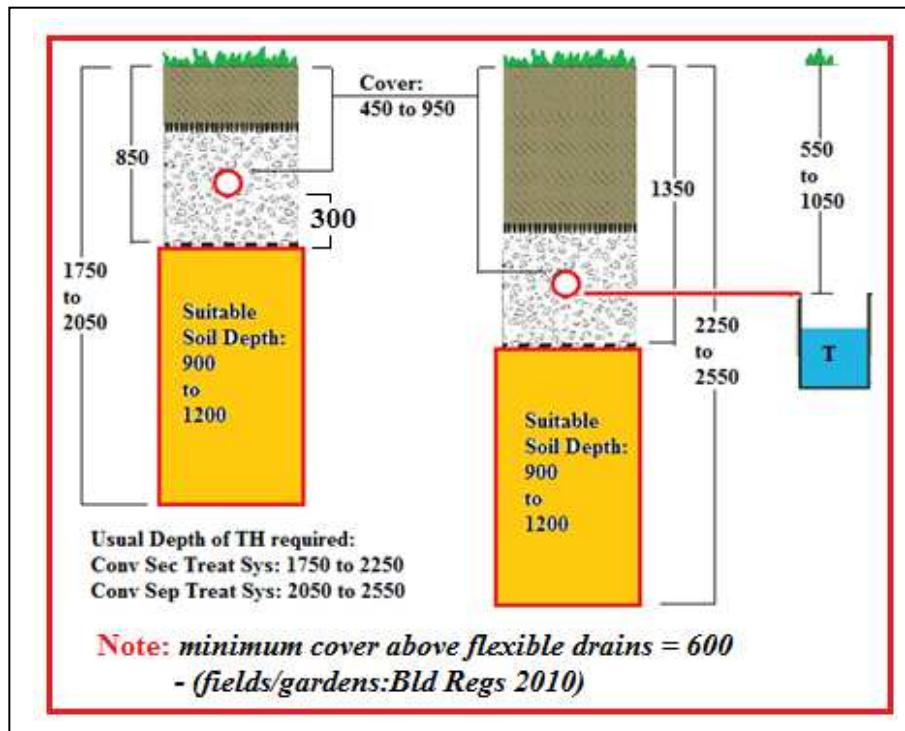


Figure 5 Soil Cover above and Soil Depth below Percolation Drains

### 6.3 Percolation Area Design

- a) When designing **percolation area layouts** (see Figure 6 Percolation Area Layouts), the ratio of the sides of the percolation area should conform to a minimum 2:1 ratio to facilitate construction and reduction on groundwater impact. The longer side of the percolation area “rectangular box” should be aligned with the contours of the site. If the site is relatively flat then ascertain the discernible slope over a wider topographical context.
- b) For ‘with-slope’ type percolation areas, it is critical that all drains run parallel with the contours of the site, while adhering to recommended falls.
- c) For ‘Cut & Fill’ type percolation areas, there is no restriction on the actual orientation of the percolation drains within the percolation “rectangular box”, however it is critical that the drains are laid to recommended falls and there must be an equal number of drains emanating from all such boxes in the system.
- d) All percolation drains must be **pip ed individually** to distribution boxes. Trenches may be **vented** singly or in groups e.g. offset common vent pipe to boundary fence.

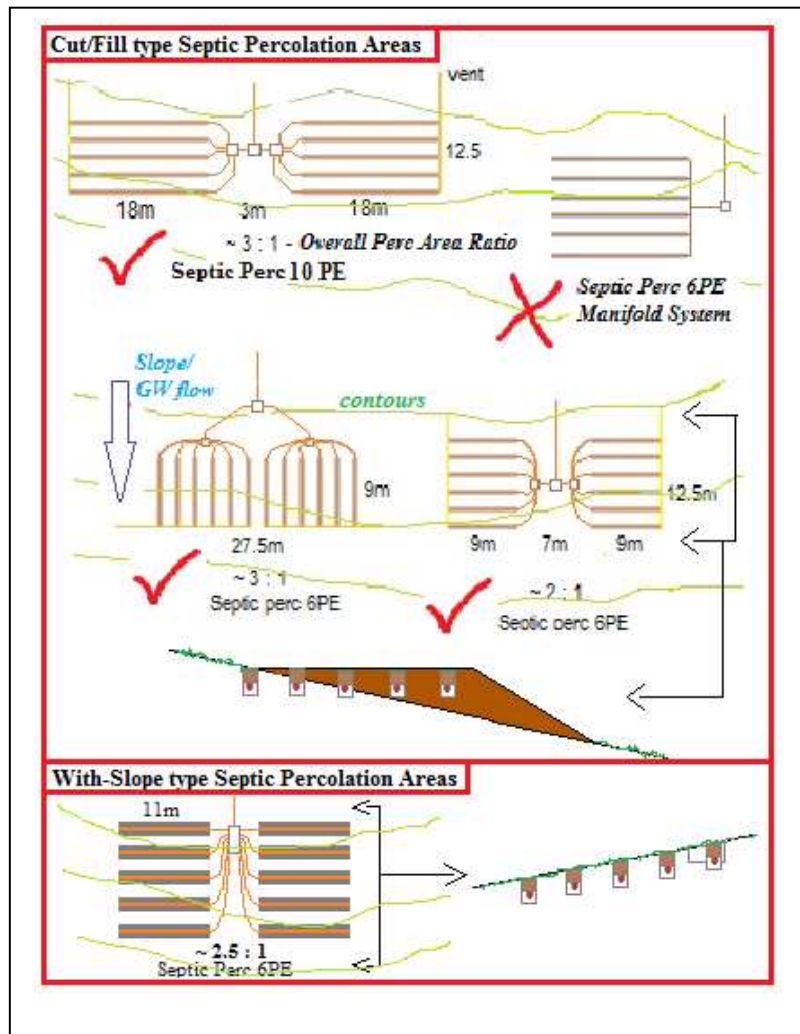


Figure 6 Percolation Area Layouts

#### 6.4 Pumped/Low Pressure Distribution Systems

- a) If a **pumped/ low pressure distribution system** to a polishing filter is proposed, a site specific design of the system must be included with the site suitability assessment. The design must be prepared by a suitably qualified individual experienced in hydraulic design, who shall submit design calculations, specifications and design drawings.

## 7 Application Supporting Information

In addition to the Site Characterisation Report, supplementary information is requested to support and illustrate the design proposal.

- a) The supporting information **must compliment and be consistent with** the information contained in the SCR and all drawings provided must be consistent with the findings and recommendations detailed in the Site Characterisation Report.
- b) Note Section 7 of Site Assessor's Guide replaces Section 3.4 of Site Characterisation Form.
- c) Before submitting a Planning Application, the Site Assessor/Agent should ensure:
  - i. The Site Assessor's wastewater treatment proposals in the SCF correspond with the Architect/Designer/Agent drawings submitted with the plans and particulars of the planning application.
  - ii. All of the supporting information, as applicable, is supplied with the application in the first instance. See Appendix 1 – Checklist of Supporting Information. Appendix 2 – Details on Supporting Information, provides the detail of the nature and full extent of the supporting information which is requested.

## Appendix 1

### Checklist of Supporting Information

<b>Attachments</b>	<b>Attached</b>
<b>Site Characterisation Report</b>	<input type="checkbox"/>
<b>Maps</b>	
1) Soil	<input type="checkbox"/>
2) Subsoil	<input type="checkbox"/>
3) Aquifer	<input type="checkbox"/>
4) Vulnerability	<input type="checkbox"/>
5) Bedrock	<input type="checkbox"/>
6) Wells	<input type="checkbox"/>
7) Natura 2000 Sites	<input type="checkbox"/>
8) Surface Features	<input type="checkbox"/>
<b>Photographs</b>	
1) Visual Assessment	<input type="checkbox"/>
2) Trial Holes	<input type="checkbox"/>
3) Percolation P and T Tests	<input type="checkbox"/>
<b>Drawings</b>	
1) Regionalised Groundwater Flow	<input type="checkbox"/>
2) Site Layout Plan	<input type="checkbox"/>
3) Site Plans	<input type="checkbox"/>
4) Longitudinal Sections	<input type="checkbox"/>
5) Cross-sections	<input type="checkbox"/>
6) Distribution Boxes	<input type="checkbox"/>
<b>Pumped Pressurised Distribution System Design</b>	<input type="checkbox"/>
<b>Certificate of Performance Results</b>	<input type="checkbox"/>

Note: See **Appendix 2 – Details of Supporting Information**

## Appendix 2

### Details of Supporting Information

#### Site Characterisation Report

Note the following general requirements in relation to the Site Characterisation Report

- 1) Site Characterisation Report should be signed by the Site Assessor.
- 2) BS 5930 descriptions should be used to describe subsoil e.g. GRAVEL, SAND, SILT, SILT/CLAY, etc. Please note use of CAPITALS to describe primary constituents and lower case to describe secondary constituents of subsoils.
- 3) Groundwater Flow Direction i.e. local groundwater flow as implied by the site contours and the direction of regional groundwater flow direction (if different)
- 4) T and P results must be included in relation to any wastewater treatment proposal.

#### Maps

The following maps should be submitted with the Site Characterisation Report:

- 1) Soil Map
- 2) Subsoil Map
- 3) Aquifer Category Map
- 4) Vulnerability Map
- 5) Bedrock Map
- 6) Wells Map
- 7) 1:50,000 National Discovery Map with estimated Regional Groundwater Flow indicated thereon along with the site location and potential water pollution target(s) i.e. surface waters/inner-outer source zones etc.
- 8) Surface Features Map. This is an OSI map to an appropriate scale showing all relevant surface features within 250 metre radius of the site. Relevant surface features include:
  - a) All dwellings and effluent treatment systems
  - b) dug wells/borehole wells/springs
  - c) surface water soakaways
  - d) watercourses & streams
  - e) open drains & drainage ditches
  - f) protected sites e.g. SAC/SPA/NHA/Freshwater Pearl Mussel
  - g) protected structures
  - h) lake or foreshore
  - i) site boundaries
  - j) trees
  - k) roads
  - l) slope breaks and/or cuts
  - m) wetlands
  - n) beaches/shellfish areas
  - o) lakes
  - p) karst features

Care **should** be taken to ensure that:

- i. All maps are clear and distinct
- ii. the site location is clearly marked on all maps.
- iii. the location of the site on the map is not obscured by any logo

Note: These maps are available from the GSI/EPA Envision/Teagasc website.

## **Photographs**

### General

Photographs must be submitted with the Site Characterisation Report in respect of:

- the Visual Assessment
- Trial Holes
- Percolation P and T tests

Specific requirements in respect of same are given below, however all photographs must be:

- 1) In hardcopy
- 2) In colour
- 3) Dated stamped
- 4) Printed on A4 pages
- 5) Minimum size 6"x4"
- 6) Clear and devoid of obscurities such as shadows and reflections etc

### Visual Assessment

- 1) of the site relative to the landscape, including any areas of poor drainage indicator vegetation
- 2) of soil or rock outcrops (if any) noted in Site Characterisation Report
- 3) of existing systems on-site (if any)
- 4) of test pits/trial hole(s) spoil heap locations on the site

### Trial Holes

*Note 1 For health and safety reasons Tipperary County Council does not require that trial holes remain open until inspected by the Environment Section. As a consequence of this a comprehensive set of photographs must be submitted in support of this section of the site assessment.*

*Note 2 All trial hole photographs shall be 6"x4" minimum size and printed on an A4 page, maximum 2 per page, devoid of obscurities such as shadows, reflections etc.*

Sufficient dated photographs per excavated trial hole(s) to support the evidence detailed in the SCF should be submitted:

- a) Full profile of the trial hole(s) taken from the correct/optimum location shown in Figure A.1 below. The photographs of the trial holes must be clear and devoid of obscurities such as shadows and reflections etc. See Figure A.2 Unclear Photograph and Figure A.3 Clear Photograph

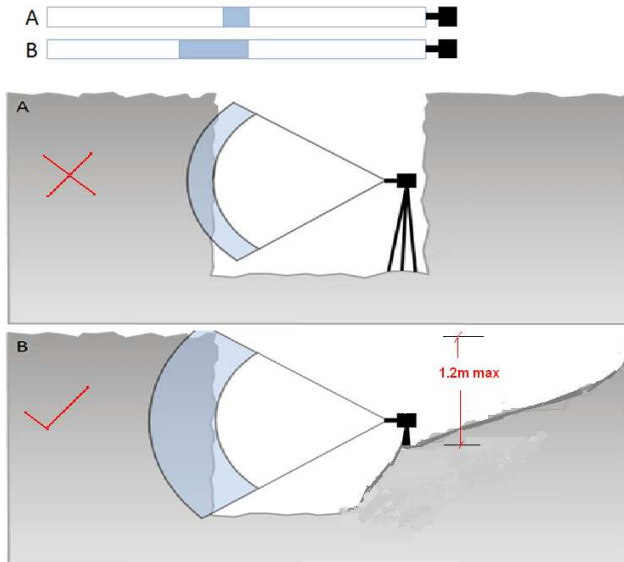


Figure A.1 Optimum Location for Taking Photographs of Trial Hole Profile.

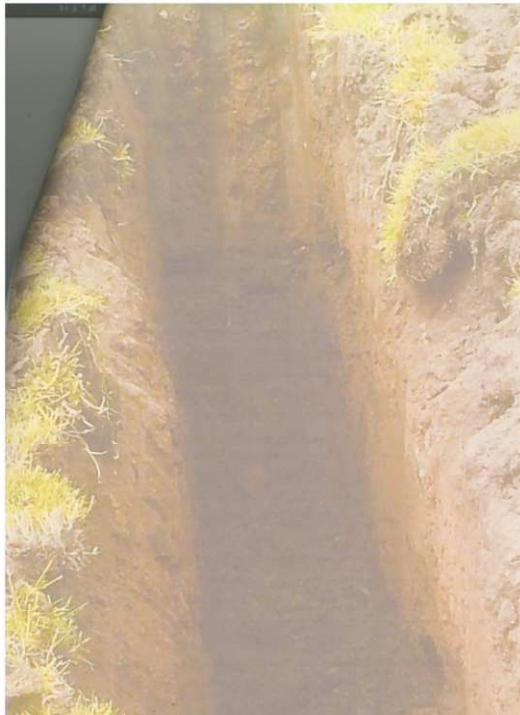


Figure A.2 Unclear Trial Hole Photograph



Figure A.3 Clear Trial Hole Photograph



- b) A levelling staff, fully extended, showing the trial hole depth\*. The photographs should show the levelling staff from a distance (see Figure A.4 Levelling Staff from Distance below) and also in close-up (see Figure A.5 Levelling Staff in Close-Up below) so that the numbers on the levelling staff are legible.

\* Alternatively a 4" flexible tape with alternate 300mm minimum segments painted thereon (see Figure A.6 Trial Hole Depth Readings with Flexible Tape).



Figure A.4 Levelling Staff from Distance



Figure A.5 Levelling Staff in Close-Up



Figure A.6 Trial Hole Depth Readings with Flexible Tape

- c) mottling/water table/broken-rock/excessive rock fragments layer(s) encountered along with a levelling staff showing the depth below ground level.
- d) the trial hole and test pit spoil heaps corresponding to excavation of various layers
- e) Where, for example, the subsoil is described as 'GRAVEL', or the subsoil layer features excessive rock fragments i.e. >20% by volume, photographs are required to support the soil classification (see Figure A.7 Excessive Rock Fragments +50% below). See also Figure A.8 Tool for Estimating % of Soil Rock Fragments by Volume below. Note the % stone content general estimate may be obtained by reference to the Teagasc Soils website (typical soil type horizons).



Figure A.7 Excessive rock fragments (+50%) T =4,  
P=15

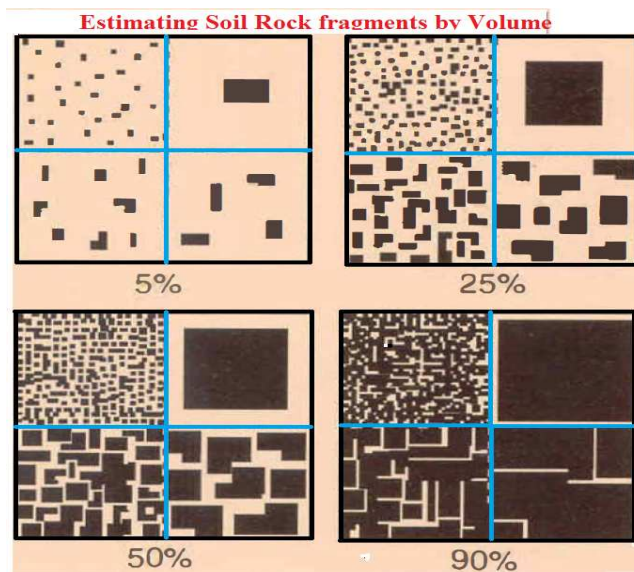
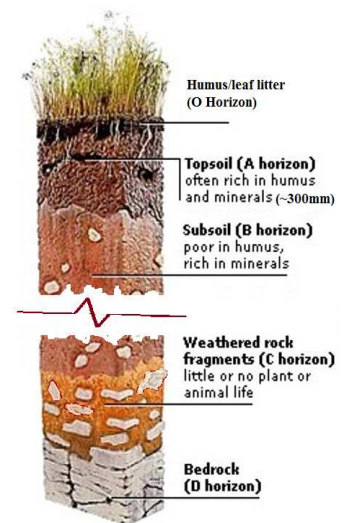


Figure A.8 Tool for Estimating % of Soil Rock  
Fragments



## Percolation P and T Tests

- 1) Photographs of T/P test holes should clearly:
  - a) Identify the locations of the T/P test holes on the site
  - b) Illustrate T/P test holes condition. Photographs of the test holes condition must be taken prior to filling the holes with water.

## **Drawings**

The following drawings should be submitted with the Site Characterisation Report:

- 1) Discovery Series Map 1:50,000 scale showing the estimated direction of regionalised groundwater flow. Note “groundwater flow” on the SCF form refers to local groundwater flow which may or may not coincide with the estimated regional flow direction.
- 2) Site Layout Plan at a scale of 1:500 showing:
  - a) Trial hole location(s) and percolation test hole location(s)
  - b) Distances from all relevant features (ref: 3.1 of Site Characterisation Form)
  - c) All existing and proposed domestic effluent treatment types and wells/boreholes/springs. Separation distances are to be noted.
  - d) All springs within 250 metres radius
  - e) Contours and spot levels on and adjacent to the site along with the proposed finished floor level for the proposed dwelling.
  - f) Estimated direction of localised groundwater flow under proposed percolation area as implied from the site contour levels i.e. perpendicular to the contours.
  - g) spot levels around the proposed soil polishing filter/percolation area
  - h) All separation distances for the proposed wastewater treatment system i.e. separation distances to ditches, boundaries, roads, dwellings etc.
  - i) North point
- 3) Site Plans
  - a) Overall plan (appropriately annotated) of the proposed foul drainage system and associated wastewater treatment system clearly indicating all aspects of the proposed conveyance system and treatment train: e.g. a.j.’s/ m.h.’s/ wwt unit/ pump-sump/ stilling chamber(s)/ distribution boxes/ percolation drains/percolation bed/ cut-fill slope intersections/ etc. (1:50 scale for details otherwise, 1:100 scale the minimum acceptable).
  - b) Overall plan (appropriately annotated) of the proposed surface water/SUDS drainage system e.g. a.j.’s, m.h.’s, soakaways/ interceptor drains/ etc. (1:50 scale for details otherwise, 1:100 scale the minimum acceptable).
  - c) Plan of the percolation area/bed inclusive of (uphill) surface water interceptor drain (where applicable), (1:50 scale for details otherwise, 1:100 scale the minimum acceptable).
- 4) Longitudinal Section and Cross-section(s).
  - (i) Comprehensive longitudinal section through the dwelling/ discharge drain/ wastewater treatment system/ boundary/other (1:100 scale the minimum acceptable)
  - (ii) Comprehensive cross-section through the percolation/infiltration area (at right angles to the longitudinal section) – 1:100 scale minimum acceptable.
  - (iii) The Section drawings should clearly show
    - a) Foul drainage design from dwelling to wastewater treatment system inclusive of manholes, invert/cover levels, falls etc
    - b) invert level of the percolation trench/polishing filter

- c) original ground levels
  - d) extent of any replacement or addition to the in-situ soils on site
  - e) depth of excavated trial hole(s)
  - f) outline of the trial hole(s) should be superimposed on all cross sections
  - g) level of limiting boundary conditions e.g. level at which bedrock/water table/seasonal water table (as indicated by mottling) is encountered, or if not encountered then the level of the base of the trial hole
  - h) depth of unsaturated subsoil
- 5) Ancillary WWTS Details – Manholes, Distribution Boxes etc.
- If distribution boxes (and/or associated stilling chambers, flow splitting chambers, manholes etc) are utilised in the design then plans and sections of these devices are required.
- Note. Care should be taken in selecting the type of material that these devices are manufactured from and that such material is appropriate to the proposed end-use and end-location. For example, reinforced concrete is both strong and robust and appropriate for most situations. PVC/plastic boxes and lids (including a,j.'s etc) on the other hand, while having excellent hydraulic properties, are susceptible to movement (unless properly bedded-in and supported) and prone to accidental damage in certain situations e.g. ride-on mower, animal hooves etc. Provided that appropriate precautions are taken, however, in any given situation, the use of such systems is acceptable. The assessor should clearly outline on the section drawing the type and construction of the proposed device(s).*

#### Notes

- i. All drawings accompanying the Site Characterisation Report (and thus forming part of the site assessment) should bear either a title block with the site assessors name and contact details (& where appropriate the assessors company logo) or otherwise be endorsed in writing by the site assessor. Note this is taken as confirming that the Site Characterisation Report and accompanying drawings are consistent and that the Site Characterisation Report and accompanying drawings accurately represent the proposed wastewater treatment system for the site.
- ii. If possible, the plan, longitudinal section(s), and a cross-section(s) should be submitted on one drawing. More than one cross-section may be desirable.
- iii. All the various elements of the effluent treatment system (septic tank / mechanical aeration unit, distribution boxes, percolation area / polishing filter etc.) should be shown on all sections and on the plan.

#### **Pumped Pressurised Distribution System Design**

If a pumped/pressurised distribution system to a soil bed or to a soil filter system is proposed then a system design should be included with the site assessment. The design must be prepared by a suitably qualified/experienced individual or consultant (i.e. Civil/Mechanical Engineer) where such design drawing(s) including hydraulic calculations and specifications **must** be submitted as part of the wastewater treatment system proposals.

## **Certificate of Performance Results**

A Certification of Performance Results (Notified Test Laboratory:PIA) must be submitted as part of the proposed wastewater treatment system documentation. Wastewater treatment products shall comply with:

- (a) Building Regulation H and TGD H(2010)
- (b) Harmonised EN12566 Standards and their Annexes (Parts 1,3,4 and 6 of EN12566 currently developed)

*Note where the relevant part of EN12566 is not yet available, products should be certified (certification may include a European Technical Approval, an Agrément Certificate or equivalent), be fit for the purpose for which they are intended, the conditions in which they are used and meet the performance requirements of the latest version of the CoP.*