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cpd Approved Event

Agents Workshop on Site Suitability Assessment for Domestic Waste Water Treatment Systems

Galway County Council

An Roinn Comhshaoil, Aeráide agus Cumarsáide
Department of the Environment, Climate and Communications

epa Environmental Protection Agency

Comhairle Chontae na Gaillimhe
Galway County Council

8th June 2023

The EPA Code of Practice (2021), changes, and what they mean for difficult sites in Galway

Risks from Domestic Waste Water Treatment Systems

- **Coliform bacteria in 43% of groundwater monitoring sites (EPA, 2018) and 15%-58% of household wells (Gill et al., 2018).**
- **165,000 Domestic Waste Water Treatment Systems co-located with household wells.**
- **Domestic waste water a significant pressure in 11% of at risk water bodies *e.g* Clarinbridge, Black (Shrule)_020, Abbert_040, Ballycuirke_010 and Mask lake**
- **50% of Domestic Waste Water Treatment Systems fail inspection.**
- **Approx. 4,000 DWWTS registered per annum.**

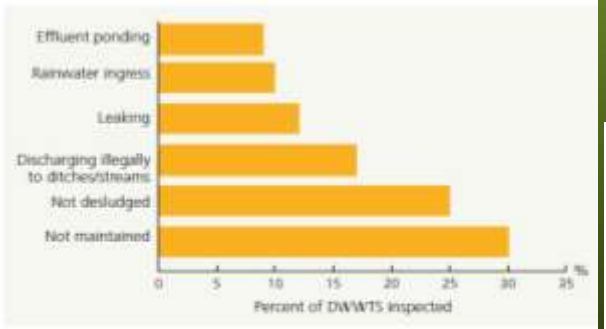
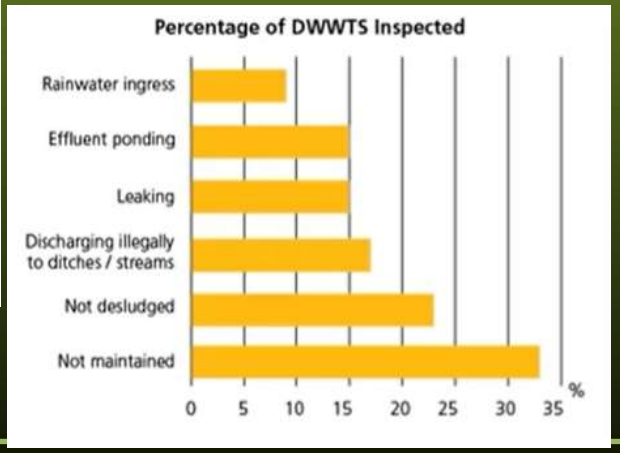
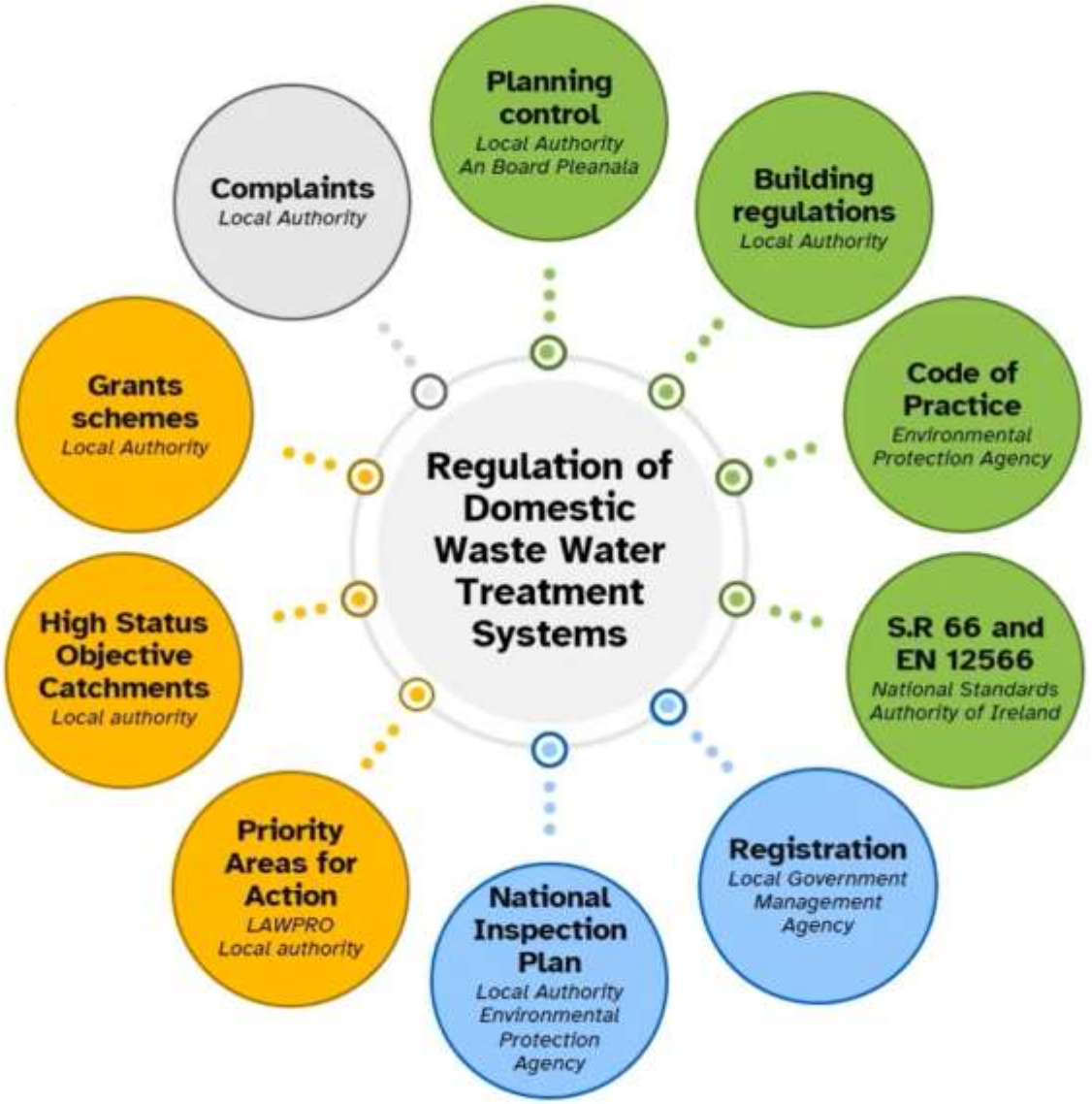


FIGURE 1: Reasons for DWWTS failures 2019 (individual DWWTS can fail for multiple reasons)



Regulatory system



Legislation

- **Water Services (Amendment) Act 2012**
- Registration Regulations (S.I. No. 220 of 2012)
- Registration (Amendment) Regulations (S.I. No. 180 of 2013)
- **Domestic Waste Water Treatment Systems Regulations (S.I. No. 223 of 2012)**
- Domestic Waste Water Treatment Systems (Financial Assistance) Regulations (S.I. No. 222 of 2013)
- Appointment Regulations (S.I. No. 384 of 2012)
- Reinspection Regulations (S.I. No. 189 of 2013)
- Commencement Order (S.I. No. 219 of 2012)
- **Housing Financial Assistance Regulations (S.I. No. 184 of 2020)**
- **Housing Financial Assistance for Prioritised Areas for Action Regulations 2020 (S.I. No. 185 of 2020)**
- **Housing Financial Assistance for High Status Objective Catchment Areas Regulations 2020 (S.I. No. 186 of 2020)**

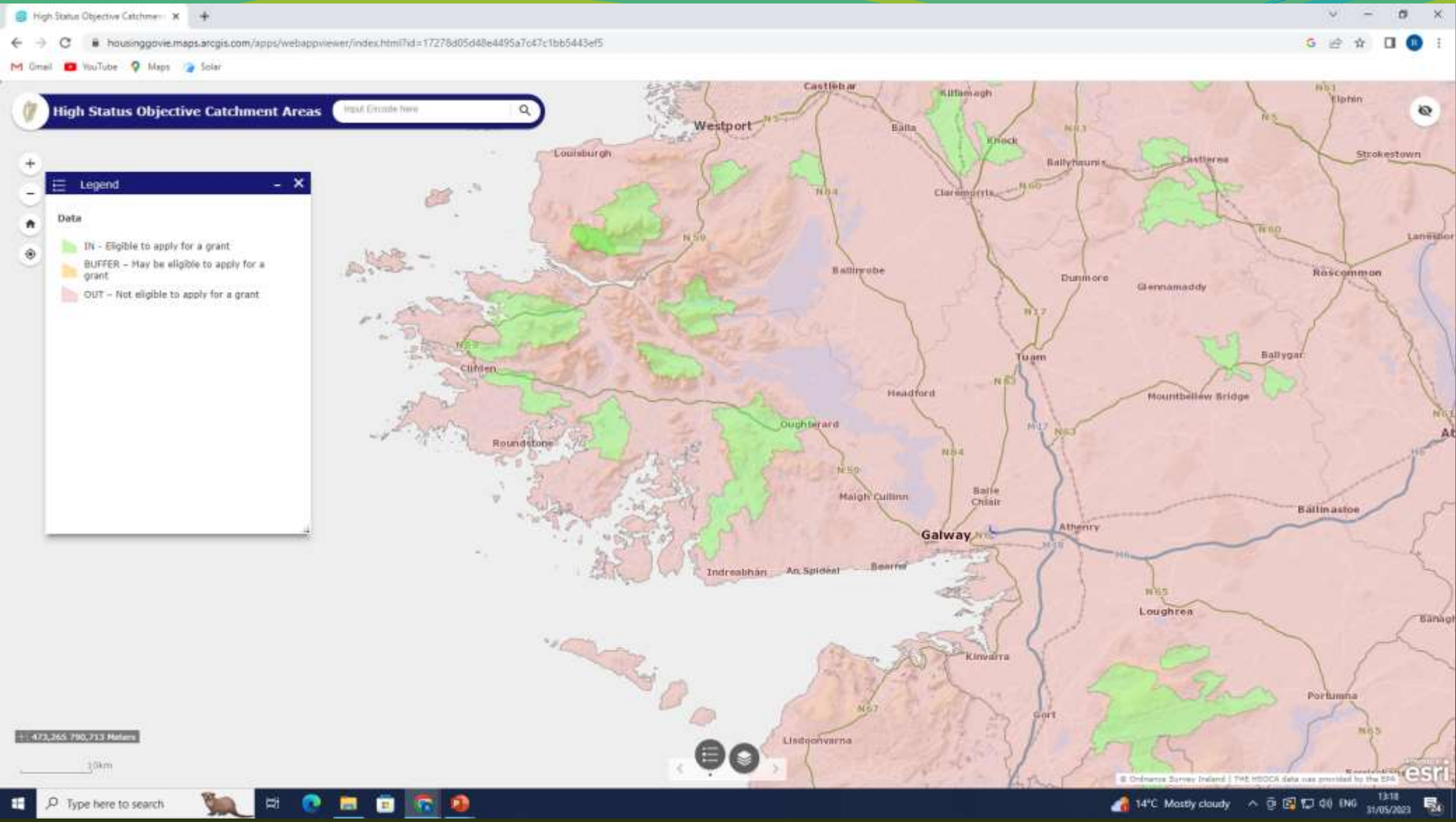
Grants

Advisory notice with actions and timeframes

Grants

- High Status Objective Areas
- National Inspection Plan
- Priority Areas for Action

Year	Grants	€
2014	29	€ 98,575
2015	85	€ 256,559
2016	72	€ 212,000
2017	56	€ 179,433
2018	83	€ 289,499
2019	160	€ 497,719
2020	112	€ 388,983
Total	597	€ 1,922,768


High Status Objective Catchment Areas
Input Eircode here
Legend
Data
IN - Eligible to apply for a grant
BUFFER – May be eligible to apply for a grant
OUT – Not eligible to apply for a grant
Westport
Castlebar
Louisburgh
Ballinrobe
Clifden
Roundstone
Oughterard
Headford
Galway
Indreabhán
An Spidéal
Maigh Cuilinn
Baile Chláir
Tuam
Dunmore
Glennamaddy
Roscommon
Ballygar
Mountbellew Bridge
Ballinasloe
Athenry
Loughrea
Kinvarra
Portumna
Gort
Lisdoonvarna
Strokestown
Castlerea
Ballyhaunis
Claremorris
Balla
Knock
Kiltimagh
Elphin
Type here to search
14°C Mostly cloudy
ENG
13:18
31/05/2023

History

History

History

History – Irish Standards

- NSAI - S.R. 6 1975
- NSAI - S.R. 6 1991

- EPA - Guidance 2000

- EPA - Code of Practice 2009
- EPA - Code of Practice 2021

- Percolation value: 1-60 → 5-60 → 1-50 → 3-90 → 3-120

1975-1991 1991-2000 2000-2009 2009-2021 2021 - ??

Review process for 2021 Code

- EPA ... Steering Committee: Department of Housing, Local Government and Heritage; City and County Management Association; Trinity College Dublin; Irish Onsite Wastewater Association and Irish Water Treatment Association.
- Expert assistance: Dr Robbie Meehan (Site Assessor) and Professor Laurence Gill (Technical Guidance and Research findings).
- Public consultation:11 December 2018 to 26 March 2019 - 37 submissions containing approximately 500 individual comments.
- Statutory consultation: Minister for the Environment, Climate and Communications and Minister for Housing, Local Government and Heritage.

Code Publication

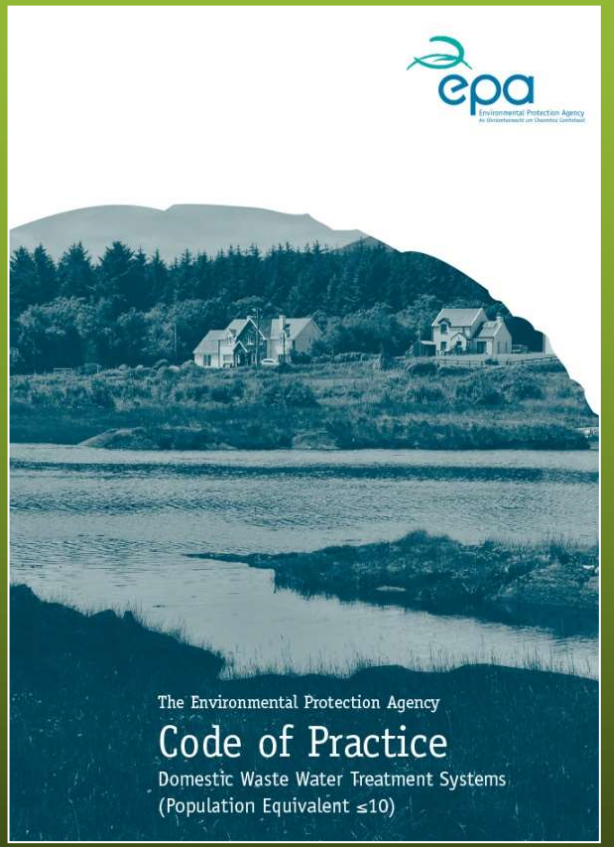
- Section 76 of the Environmental Protection Agency Act,1992 (as amended).
- Issued 24/03/2021 – came into effect 07/06/2021.
- Published online with electronic form, explanatory letter and response to public consultation.

  http://www.epa.ie/water/wastewater/guidance/cop/

- Hardcopies from EPA Publications Office

  publications@epa.ie

- Clerical amendments since:
  - Site characterisation form: T 100 value in Scenario 1 from 300 to 480 minutes (page 94 and 96).
  - Text relating to R2[3] and R2[4] GWPR (page 113).



Legal status

- Section 76 of the EPA Act – Codes of Practice

'practical guidance …for the purposes of environmental protection'

- Building Regulations: - Technical Guidance Document H –

'…systems for single houses should comply with the…EPA Code of Practice 2009 Wastewater Treatment and Disposal Systems Serving Single Houses'

'*if* [a] *technical specification is subsequently revised or updated by the issuing body, the new version may be used'*

- Planning circular NRUP 01/2021 refers to application of the Code of Practice under Section 22(2)(c) of the Planning and Development Regulations which requires:

"…information on the on-site treatment system proposed and evidence as to the suitability of the site for the system proposed."

Transitional arrangements

- 2021 Code applied from **7th June 2021**.
- 2009 Code could be used where planning permission had been applied for or site assessment commenced before **7th June 2021**.

Key messages

- Proper site characterisation and assessment
- Proper design
- Proper follow on … installation, commissioning and maintenance

- Section 1.3 … Variances allowable on existing sites, if all CoP criteria can not be met … but there is a need to comply with Building Regulations, technical standards, and adequate protection of the environment and human health
- SR 66 from 2015 – new National Annex included, and also called up by TGD H and considers EN Standards 1 to 7
- Sections 2.3 – WFD, 2.4 – Discharge Licences, 2.5 – DWWTS Law, 2.6 – Protected Species and Areas

Main changes

- Drip dispersal (120)
- Low pressure pipe distribution (90)
- Willow evapotranspiration systems with soil polishing filter


Low pressure pipe


Willow evapotranspiration systems


Drip dispersal

- Section 3.4 - minimising wastewater flow

Chapter 5 – Site characterisation

- **Terminology change:**
  - The percolation test terminology has changed, from ‘T-test’ and ‘P-test’ to ‘subsurface’ and ‘surface’ test.
  - This is a terminology change only, it does not affect how the tests are completed.

- **Percolation test:**
  - The percolation test methodology was also amended to allow it to extend to a percolation value of 120, permissible using drip dispersal.
  - This is also reflected in Appendix D where the percolation test is set out in more detail.

- **Density of >6 houses per hectare …**
  - Where ‘X’, ‘E’ or ‘H’ groundwater vulnerability, issues with *E. Coli* and nitrate

- **Minimum depth of 500 mm of *in situ* suitable soil and / or subsoil required for suitable sites for discharge to ground**

Chapter 6 – Determining site suitability and the appropriate DWWTS

- A **new chapter** to consolidate all the site characterisation criteria into one chapter:

  - Section 6.3 consolidates minimum separation distances.

  (A separation distance of 25m is specified for free water surface constructed wetlands to neighbouring dwelling houses.)

  - Section 6.4 consolidates the minimum unsaturated soil and/or subsoil depth requirements.

  (These are the same as the 2009 Code except provision is made for lesser depths for drip dispersal systems in low permeability soils and infiltration areas following tertiary systems where certain levels of E.coli treatment is achieved. Infiltration areas for other tertiary systems require the same depths of unsaturated soil and/or subsoil as polishing filters following secondary systems.)

  - Section 6.5 covers the interpretation of percolation test results.

  (Provision has also been made for low-pressure pipe distribution and drip dispersal systems.)

Chapter 7 – Septic tank systems (incl. percolation areas)

- Section 7.1: S.R. 66 requires that the septic tank nominal and usable capacities are declared. The declared usable capacity of the septic tank being installed on site must be no less than the calculated design capacity. The text has been amended and table which referred to nominal capacity has been removed to clarify.
- Section 7.2.3, Table 7.3: specifies 12–32 mm washed gravel or broken stone aggregate.
- Section 7.2.4 and Figure 7.4: The text and figure clarify that the top of the trench gravel should not extend above ground level.
- Other criteria such depth to bedrock etc. are covered in Chapter 6 so are not repeated in this section.

Chapter 8 – Secondary treatment systems receiving septic tank effluent (soil filters, sand filters, constructed wetlands and packaged media filters)

- Section 8.1.1: Intermittent soil filters
  - Term ‘intermittent soil filters’ used to distinguish them from tertiary soil polishing filters (Section 10.1).
  - Typical intermittent soil filter requirements are specified in Table 8.1.

- Section 8.1.2: Intermittent sand filters
  - Term ‘intermittent sand filters’ used to distinguish them from tertiary sand polishing filters (Section 10.2.1).
  - Typical intermittent sand filter requirements are specified in Table 8.2.

Chapter 8 – Secondary treatment systems receiving septic tank effluent (soil filters, sand filters, constructed wetlands and packaged media filters)

- Section 8.1.3: The areas required for vertical flow reed beds have been amended to 4 m^2 per population equivalent.

- Section 8.1.7: Access to free water surface constructed wetlands is required to be controlled by fencing to the given specification. They are required to be located as far from dwellings as possible (see also table 6.2).

- Section 8.2.2 covers coconut husk media filters.

- Section 8.3 covers willow bed evapotranspiration systems.

Chapter 10 – Tertiary treatment systems receiving secondary treated effluent (including soil polishing filters)

- The chapter has been divided into:
  - tertiary soil polishing filters (10.1) for treatment and disposal of secondary effluent to ground;
  - tertiary treatment systems (10.2) where there is an additional treatment module (after the secondary treatment system) which then discharges to an infiltration area.
- Section 10.1 introduces low-pressure pipe distribution and drip dispersal systems.
- The minimum depths required are specified in Table 6.3.
- 0.9m is required (in R1 and R2[1] areas), except for drip dispersal systems in low permeability soils (0.6m) and infiltration areas following tertiary systems where certain levels of E.coli treatment is achieved (0.6m).

Tertiary treatment systems may be used where treatment over and above secondary treatment is necessary, e.g. nutrient and pathogens. The treatment performance of the system should match that need.

Chapter 10 – Tertiary treatment systems receiving secondary treated effluent (including soil polishing filters)

Table 10.1: Infiltration/treatment area and trench length design for tertiary treatment, per PE[1]

Percolation values (PVs)	Pumped or underlying gravity discharge (Options 1 and 2)	Gravity discharge into 500 mm wide trenches (Option 3)	Low-pressure pipe distribution into 300 mm wide trenches[4] (Option 4)	Drip dispersal system (Option 5)	Tertiary infiltration area (Option 6)
	[2] Area required per person (m^2)	Trench length required per person (m)	Trench length required per person (m)	Area required per person (m^2)	Area[5] required per person (m^2)
$3 \leq PV \leq 20$	≥7.5	≥6	≥6	≥5	≥3.75
$21 < PV \leq 40$	≥15	≥12	≥12	≥14	≥7.5
$41 < PV \leq 50$	≥30	≥17[3]	≥17	≥16	≥15
$51 < PV \leq 75$	≥50	≥19	≥19	≥22	≥25
$76 < PV \leq 90$	–	–	≥28	≥34	–
$91 < PV \leq 120$	–	–	–	≥54	–

Chapters 11 and 12 – Installation, operation and maintenance

- References to legislation and standards have been bought up to date in Chapter 11.

- Section 11.3: The maximum number of outlet pipes from any distribution device is six.

- Section 11.5 covers installation and operation of low-pressure pipe distribution and drip dispersal systems.

- Section 12.2.2 provides new guidance on determining septic tank desludging frequency based on tank size and number of house occupants.

Chapters 11 and 12 – Installation, operation and maintenance

Table 12.2: De-sludging frequency (1 to 5 years) for various sizes of tank and Number of house occupants

Tank useable volume (m^3)	Number of house occupants						
	2	3	4	5	6	7	8
2.5	5	3	2	1	1	1	1
3	5	3	2	2	1	1	1
3.5	5	4	3	2	2	1	1
4	5	5	3	3	2	2	1
4.5	5	5	4	3	2	2	2
5	5	5	5	3	3	2	2
5.5	5	5	5	4	3	2	2
6	5	5	5	5	3	3	2

- **Example:** 3.5m^3 tank for a 3-person house = every 4 years

The nub of sites being suitable under the 2021 Code

6. DETERMINING SITE SUITABILITY AND THE APPROPRIATE DWWTS

6.1 Integration of the Desk Study and On-Site Assessment

The information gathered during the desk study and the on-site assessment is used to characterise the site and, if the site is deemed suitable, to choose and design an appropriate DWWTS.

In summary, determining site suitability means checking that all the following requirements relevant to the site are met:

- the natural slope is ≤1:8;
- all required minimum separation distances from the DWWTS can be met;
- all required minimum depths of unsaturated soil and/or subsoil are present on the portion of the site hosting the DWWTS;
- percolation values of the soil and/or subsoil are within the acceptable ranges;
- any other issues arising from the site characterisation.

These are detailed further below. Table 6.1 summarises the relevance of the data collected from the desk study and the on-site assessment.

The cumulative loading from on-site DWWTSs should also be considered, particularly in areas of high-density one-off housing (see Section 5.4.1).

Table 6.1: Information obtained from the desk study and on-site assessment

Information collected	Relevance	Factor determined
GWPR zoning Hydrological features Density of existing	Identifies groundwater protection requirements and receptors at risk Potential cumulative nutrient	Site restrictions

The nub of sites being suitable under the 2021 Code

- Slope ≤ 1:8

The nub of sites being suitable under the 2021 Code

- All required minimum separation distances from the DWWTS can be met

The nub of sites being suitable under the 2021 Code

- All required minimum depths of unsaturated soil and/or subsoil are present on the portion of the site hosting the DWWTS

Water table


‘Mottling’
Record it and mention it’s absence / presence at all times
Mottling

6. DETERMINING SITE SUITABILITY AND THE APPROPRIATE DWWTS

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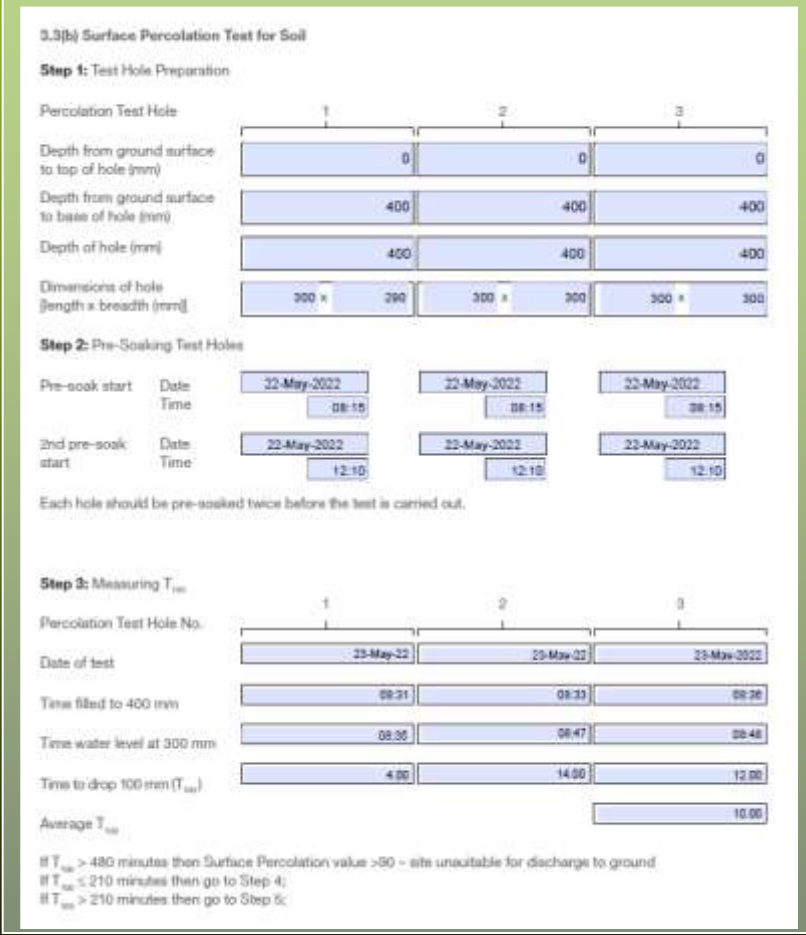
Information collected	Relevance	Factor determined
GWPR zoning Hydrological features Density of existing	Identifies groundwater protection requirements and receptors at risk Potential cumulative nutrient	Site restrictions

The nub of sites being suitable under the 2021 Code

- Percolation values of soil and/or subsoil are within the acceptable ranges

Percolation tests – the numbers …

- Percolation value of 3 –
  - 3 holes



3.3(b) Surface Percolation Test for Soil

Step 1: Test Hole Preparation

Percolation Test Hole	1	2	3
Depth from ground surface to top of hole (mm)	0	0	0
Depth from ground surface to base of hole (mm)	400	400	400
Depth of hole (mm)	400	400	400
Dimensions of hole (length x breadth (mm))	300 x 300	300 x 300	300 x 300

Step 2: Pre-Soaking Test Holes

		1	2	3
Pre-soak start	Date	22-May-2022	22-May-2022	22-May-2022
	Time	08:15	08:15	08:15
2nd pre-soak start	Date	22-May-2022	22-May-2022	22-May-2022
	Time	12:10	12:10	12:10

Each hole should be pre-soaked twice before the test is carried out.

Step 3: Measuring T_{100}

Percolation Test Hole No.	1	2	3
Date of test	23-May-22	23-May-22	23-May-2022
Time filled to 400 mm	08:31	08:33	08:36
Time water level at 300 mm	08:36	08:47	08:48
Time to drop 100 mm (T_{100})	4.00	14.00	12.00
Average T_{100}			10.00

If T_{100} > 480 minutes then Surface Percolation value >90 – site unsuitable for discharge to ground
If T_{100} ≤ 210 minutes then go to Step 4;
If T_{100} > 210 minutes then go to Step 5;

Step 4: Standard Method (where $T_{100} \leq 210$ minutes)

Percolation Test Hole	1			2			3		
Fill no.	Start Time (at 300 mm)	Finish Time (at 200 mm)	ΔT (min)	Start Time (at 300 mm)	Finish Time (at 200 mm)	ΔT (min)	Start Time (at 300 mm)	Finish Time (at 200 mm)	ΔT (min)
1	08:35	08:44	9.00	08:47	09:02	15.00	08:48	09:01	13.00
2	08:44	08:54	10.00	09:02	09:18	16.00	09:01	09:15	14.00
3	08:54	09:07	13.00	09:18	09:35	17.00	09:15	09:32	17.00
Average ΔT Value			10.67			16.00			14.67

Average ΔT/4 = [Hole No.1] 2.67 (T_1) | Average ΔT/4 = [Hole No.2] 4.00 (T_2) | Average ΔT/4 = [Hole No.3] 3.67 (T_3)

Result of Test: Surface Percolation Value = 3.44 (min/25 mm)

Comments:

S1, S2 and S3 confirm the classification of the soil as a sandy loam underlain by a gravelly SAND with occasional cobbles. All holes were empty on the morning of the test following two presoaks the previous day. The surface percolation test rates support the observations made on the trial hole and the visual assessment on the drainage and textural characteristics of the topsoil and the upper portion of the subsoil.

Step 5: Modified Method (where $T_{100} > 210$ minutes)

Percolation Test Hole No. 1

Fall of water in hole (mm)	Time Factor = T_f	Start Time hh:mm	Finish Time hh:mm	Time of fall (mins) = T_m	$K_b = T_f / T_m$	T – Value = 4.45 / K_b
300 - 250	8.1			0.00		
250 - 200	9.7			0.00		
200 - 150	11.9			0.00		
150 - 100	14.1			0.00		
Average	T- Value		T- Value Hole 1 = (T_1)			0.00

Percolation Test Hole No. 2

Fall of water in hole (mm)	Time Factor = T_f	Start Time hh:mm	Finish Time hh:mm	Time of fall (mins) = T_m	$K_b = T_f / T_m$	T – Value = 4.45 / K_b
300 - 250	8.1			0.00		
250 - 200	9.7			0.00		
200 - 150	11.9			0.00		
150 - 100	14.1			0.00		
Average	T- Value		T- Value Hole 2 = (T_2)			0.00

Result of Test: Surface Percolation Value = 0.00 (min/25 mm)

Percolation Test Hole No. 3

Percolation tests – the numbers …

- Percolation value of 24 –
  - 3 holes

3.3(a) Subsurface Percolation Test for Subsoil

Step 1: Test Hole Preparation

Percolation Test Hole	1	2	3
Depth from ground surface to top of hole (mm) (A)	300	400	400
Depth from ground surface to base of hole (mm) (B)	700	800	800
Depth of hole (mm) [B - A]	400	400	400
Dimensions of hole [length x breadth (mm)]	300 x 300	300 x 300	320 x 300

Step 2: Pre-Soaking Test Holes

		1	2	3
Pre-soak start	Date	22-May-2022	22-May-2022	22-May-2022
	Time	08:15	08:15	08:15
2nd pre-soak start	Date	22-May-2022	22-May-2022	22-May-2022
	Time	12:10	12:10	12:10

Each hole should be pre-soaked twice before the test is carried out.

Step 3: Measuring T_{100}

Percolation Test Hole No.	1	2	3
Date of test	23-05-2022	23-05-2022	23-05-2022
Time filled to 400 mm	08:22	08:25	08:28
Time water level at 300 mm	09:21	09:36	09:47
Time (min.) to drop 100 mm (T_{100})	59.00	71.00	79.00
Average T_{100}			69.67

If T_{100} > 480 minutes then Subsurface Percolation value >120 – site unsuitable for discharge to ground
If T_{100} ≤ 210 minutes then go to Step 4;
If T_{100} > 210 minutes then go to Step 5;

Step 4: Standard Method (where T_{100} ≤ 210 minutes)

Percolation Test Hole	1			2			3		
Fill no.	Start Time (at 300 mm)	Finish Time (at 200 mm)	Δt (min)	Start Time (at 300 mm)	Finish Time (at 200 mm)	Δt (min)	Start Time (at 300 mm)	Finish Time (at 200 mm)	Δt (min)
1	09:21	10:34	73.00	09:36	10:54	78.00	09:47	11:12	85.00
2	10:34	11:57	83.00	10:54	12:37	103.00	11:12	12:46	94.00
3	11:57	13:54	117.00	12:37	14:49	132.00	12:46	14:44	118.00
Average Δt Value			91.00			104.33			99.00
	Average Δt/4 = [Hole No.1]		22.75 (t_1)	Average Δt/4 = [Hole No.2]		26.08 (t_2)	Average Δt/4 = [Hole No.3]		24.75 (t_3)

Result of Test: Subsurface Percolation Value = 24.53 (min/25 mm)

Comments:

SS1, SS2 and SS3 confirm the classification of the subsoil as a sandy SILT with occasional gravels, over a slightly sandy SILT/CLAY with occasional gravels. All holes were empty on the morning of the tests following two presoaks the previous day. The subsurface test rates support the observations made on the trial hole and the visual assessment with respect to the textural and drainage class of the subsoil.

Step 5: Modified Method (where T_{100} > 210 minutes)

Percolation Test Hole No. 1

Fall of water in hole (mm)	Time Factor = T_f	Start Time hh:mm	Finish Time hh:mm	Time of fall (mins) = T_m	$K_s = T_f / T_m$	T – Value = 4.45 / K_s
300 - 250	8.1			0.00		
250 - 200	9.7			0.00		
200 - 150	11.9			0.00		
150 - 100	14.1			0.00		
Average	T- Value		T- Value Hole 1 = (T_1)			0.00

Percolation Test Hole No. 2

Fall of water in hole (mm)	Time Factor = T_f	Start Time hh:mm	Finish Time hh:mm	Time of fall (mins) = T_m	$K_s = T_f / T_m$	T – Value = 4.45 / K_s
300 - 250	8.1			0.00		
250 - 200	9.7			0.00		
200 - 150	11.9			0.00		
150 - 100	14.1			0.00		
Average	T- Value		T- Value Hole 2 = (T_2)			0.00

Result of Test: Subsurface Percolation Value = 0.00 (min/25 mm)

Percolation Test Hole No. 3

Percolation tests – the numbers …

- Percolation value of 39 –
  - 3 holes

3.3(a) Subsurface Percolation Test for Subsoil

Step 1: Test Hole Preparation

Percolation Test Hole	1	2	3
Depth from ground surface to top of hole (mm) (A)	300	400	400
Depth from ground surface to base of hole (mm) (B)	700	800	800
Depth of hole (mm) [B - A]	400	400	400
Dimensions of hole [length x breadth (mm)]	300 x 300	300 x 300	320 x 300

Step 2: Pre-Soaking Test Holes

		1	2	3
Pre-soak start	Date	22-May-2022	22-May-2022	22-May-2022
	Time	08:15	08:15	08:15
2nd pre-soak start	Date	22-May-2022	22-May-2022	22-May-2022
	Time	15:10	15:10	15:10

Each hole should be pre-soaked twice before the test is carried out.

Step 3: Measuring T_{100}

Percolation Test Hole No.	1	2	3
Date of test	23-05-2022	23-05-2022	23-05-2022
Time filled to 400 mm	08:22	08:25	08:28
Time water level at 300 mm	09:54	10:21	10:18
Time (min.) to drop 100 mm (T_{100})	92.00	116.00	110.00
Average T_{100}			106.00

If T_{100} > 480 minutes then Subsurface Percolation value >120 – site unsuitable for discharge to ground
If $T_{100} \leq 210$ minutes then go to Step 4;
If T_{100} > 210 minutes then go to Step 5;

Step 4: Standard Method (where $T_{100} \leq 210$ minutes)

Percolation Test Hole	1			2			3		
Fill no.	Start Time (at 300 mm)	Finish Time (at 200 mm)	Δt (min)	Start Time (at 300 mm)	Finish Time (at 200 mm)	Δt (min)	Start Time (at 300 mm)	Finish Time (at 200 mm)	Δt (min)
1	09:54	11:53	119.00	10:21	12:46	145.00	10:18	12:29	131.00
2	11:53	14:10	137.00	12:46	15:37	171.00	12:29	15:01	152.00
3	14:10	16:51	161.00	15:37	18:53	196.00	15:01	18:14	193.00
Average Δt Value			139.00			170.67			158.67
	Average Δt/4 = [Hole No.1]		34.75 (t_1)	Average Δt/4 = [Hole No.2]		42.67 (t_2)	Average Δt/4 = [Hole No.3]		39.67 (t_3)

Result of Test: Subsurface Percolation Value = 39.03 (min/25 mm)

Comments:

SS1, SS2 and SS3 confirm the classification of the subsoil as a sandy SILT/CLAY with occasional gravels, over a slightly sandy SILT/CLAY with occasional gravels. All holes were empty on the morning of the tests following two presoaks the previous day. The subsurface test rates support the observations made on the trial hole and the visual assessment with respect to the textural and drainage class of the subsoil.

Step 5: Modified Method (where $T_{100} > 210$ minutes)

Percolation Test Hole No.	1						2					
Fall of water in hole (mm)	Time Factor = T_f	Start Time hh:mm	Finish Time hh:mm	Time of fall (mins) = T_m	$K_s = T_f / T_m$	T – Value = 4.45 / K_s	Time Factor = T_f	Start Time hh:mm	Finish Time hh:mm	Time of fall (mins) = T_m	$K_s = T_f / T_m$	T – Value = 4.45 / K_s
300 - 250	8.1			0.00			8.1			0.00		
250 - 200	9.7			0.00			9.7			0.00		
200 - 150	11.9			0.00			11.9			0.00		
150 - 100	14.1			0.00			14.1			0.00		
Average	T- Value		T- Value Hole 1 = (T_1)	0.00			T- Value		T- Value Hole 2 = (T_2)	0.00		

Percolation Test Hole No. 3

Result of Test: Subsurface Percolation Value = 0.00 (min/25 mm)

Percolation tests – the numbers …

- Percolation value of 50 using Modified Method –
  - 3 holes

3.3(a) Subsurface Percolation Test for Subsoil

Step 1: Test Hole Preparation

Percolation Test Hole	1	2	3
Depth from ground surface to top of hole (mm) (A)	300	400	400
Depth from ground surface to base of hole (mm) (B)	700	800	800
Depth of hole (mm) [B - A]	400	400	400
Dimensions of hole [length x breadth (mm)]	300 x 300	300 x 300	320 x 300

Step 2: Pre-Soaking Test Holes

		1	2	3
Pre-soak start	Date	22-May-2022	22-May-2022	22-May-2022
	Time	08:15	08:15	08:15
2nd pre-soak start	Date	22-May-2022	22-May-2022	22-May-2022
	Time	15:10	15:10	15:10

Each hole should be pre-soaked twice before the test is carried out.

Step 3: Measuring T_{100}

Percolation Test Hole No.	1	2	3
Date of test	23-05-2022	23-05-2022	23-05-2022
Time filled to 400 mm	08:22	08:25	08:28
Time water level at 300 mm	11:53	11:56	12:02
Time (min.) to drop 100 mm (T_{100})	211.00	211.00	214.00
Average T_{100}			212.00

If T_{100} > 480 minutes then Subsurface Percolation value >120 – site unsuitable for discharge to ground
If $T_{100} \leq 210$ minutes then go to Step 4;
If T_{100} > 210 minutes then go to Step 5;

Step 5: Modified Method (where T_{100} > 210 minutes)

Percolation Test Hole No. 1

Fall of water in hole (mm)	Time Factor = T_f	Start Time hh:mm	Finish Time hh:mm	Time of fall (mins) = T_m	$K_s = T_f / T_m$	T – Value = 4.45 / K_s
300 - 250	8.1	11:53	13:48	115.00	0.07	63.18
250 - 200	9.7	13:48	15:44	116.00	0.08	53.22
200 - 150	11.9	15:44	17:40	116.00	0.10	43.38
150 - 100	14.1	17:40	19:36	116.00	0.12	36.61
Average	T- Value		T- Value Hole 1 = (T_1)			49.10

Percolation Test Hole No. 2

Fall of water in hole (mm)	Time Factor = T_f	Start Time hh:mm	Finish Time hh:mm	Time of fall (mins) = T_m	$K_s = T_f / T_m$	T – Value = 4.45 / K_s
300 - 250	8.1	11:56	13:54	118.00	0.07	64.83
250 - 200	9.7	13:54	15:52	118.00	0.08	54.13
200 - 150	11.9	15:52	17:51	119.00	0.10	44.50
150 - 100	14.1	17:51	19:50	119.00	0.12	37.56
Average	T- Value		T- Value Hole 2 = (T_2)			50.25

Percolation Test Hole No. 3

Fall of water in hole (mm)	Time Factor = T_f	Start Time hh:mm	Finish Time hh:mm	Time of fall (mins) = T_m	$K_s = T_f / T_m$	T – Value = 4.45 / K_s
300 - 250	8.1	12:02	14:00	118.00	0.07	64.83
250 - 200	9.7	14:00	15:58	118.00	0.08	54.13
200 - 150	11.9	15:58	17:59	121.00	0.10	45.25
150 - 100	14.1	17:59	20:00	121.00	0.12	38.19
Average	T- Value		T- Value Hole 3 = (T_3)			50.60

Result of Test: Subsurface Percolation Value = 49.98 (min/25 mm)

Comments:

SS1, SS2 and SS3 confirm the classification of the subsoil as a sandy SILT/CLAY with occasional gravels, over a slightly sandy SILT/CLAY with occasional gravels. All holes were empty on the morning of the tests following two presoaks the previous day. The subsurface test rates support the observations made on the trial hole and the visual assessment with respect to the textural and drainage class of the subsoil.

Percolation tests – the numbers …

- Percolation value of 62 using Modified Method –
  - 14 hours on site
- Percolation value of 75 using Modified Method –
  - 17 hours on site
- Percolation value of 90 using Modified Method –
  - 20 hours on site
- Percolation value of 120 using Modified Method –
  - 26.5 hours on site

Standard and Modified Surface and Subsurface Percolation Tests

The standard percolation test (see Steps 1–4, Appendix D) should be carried out at all sites where the subsoil characteristics suggest that the percolation result might be less than or equal to 50.

In the case of CLAY or SILT/CLAY subsoil, where the percolation value is likely to be greater than 50, a modified percolation test may need to be carried out. This test is outlined in Step 5 of Appendix D and is a modification of the standard method whereby an approximation of the percolation value for relatively poorly permeable sites can be made in a shorter time frame, thus reducing to a degree the time spent on site.

Difficult sites and difficult questions

Bedrock … what is it?

… the ‘unweathered’ rock below the cover of unlithified deposits …

This ‘unweathered’ descriptor is crucial !


Bellewstown, Meath


Reaghstown, Ardee

Bedrock … where is it?


Percolation tests – existing houses proposing extensions
… bedroom numbers not changing

Percolation tests – existing houses and bedroom numbers rising … appraisal of existing system required …

Percolation tests – existing houses … appraisal of existing system required … and proof of infiltration / treatment area …

Percolation tests – existing houses … bedrooms numbers rising and Site Characterisation needed…

1.3 Variances for Existing Systems, Sensitive Areas and New Technologies

Adoption without modification of the specifications in this document may not, in all circumstances, be appropriate.

In sensitive areas, such as bathing water catchments, high status river catchments, high status lake catchments, drinking water source protection areas or zones of contribution to public water supplies, localities adjacent to shellfish areas designated through the Shellfish Water Directive (2006/113/EC) or pearl mussel catchments, local authorities may apply and require standards higher than those specified within this CoP.

Existing DWWTSs may not meet the performance requirements as set out in this CoP. If existing DWWTSs are being upgraded, variances to the requirements set out within this CoP may be considered by the local authority where the authority is satisfied that the proposed upgrade will protect human health and the environment. DWWTSs serving buildings of architectural or historical interest may be especially likely to give rise to such circumstances. Homeowners should consult with their local authority to determine if planning permission is required for proposed upgrades.

The use of new and innovative products and technologies must be considered in detail by local authorities on a case-by-case basis with due regard to:

- compliance with building regulations;
- compliance with technical standards as appropriate;
- evidence of suitability internationally or in Ireland;
- adequate protection of the environment and human health.

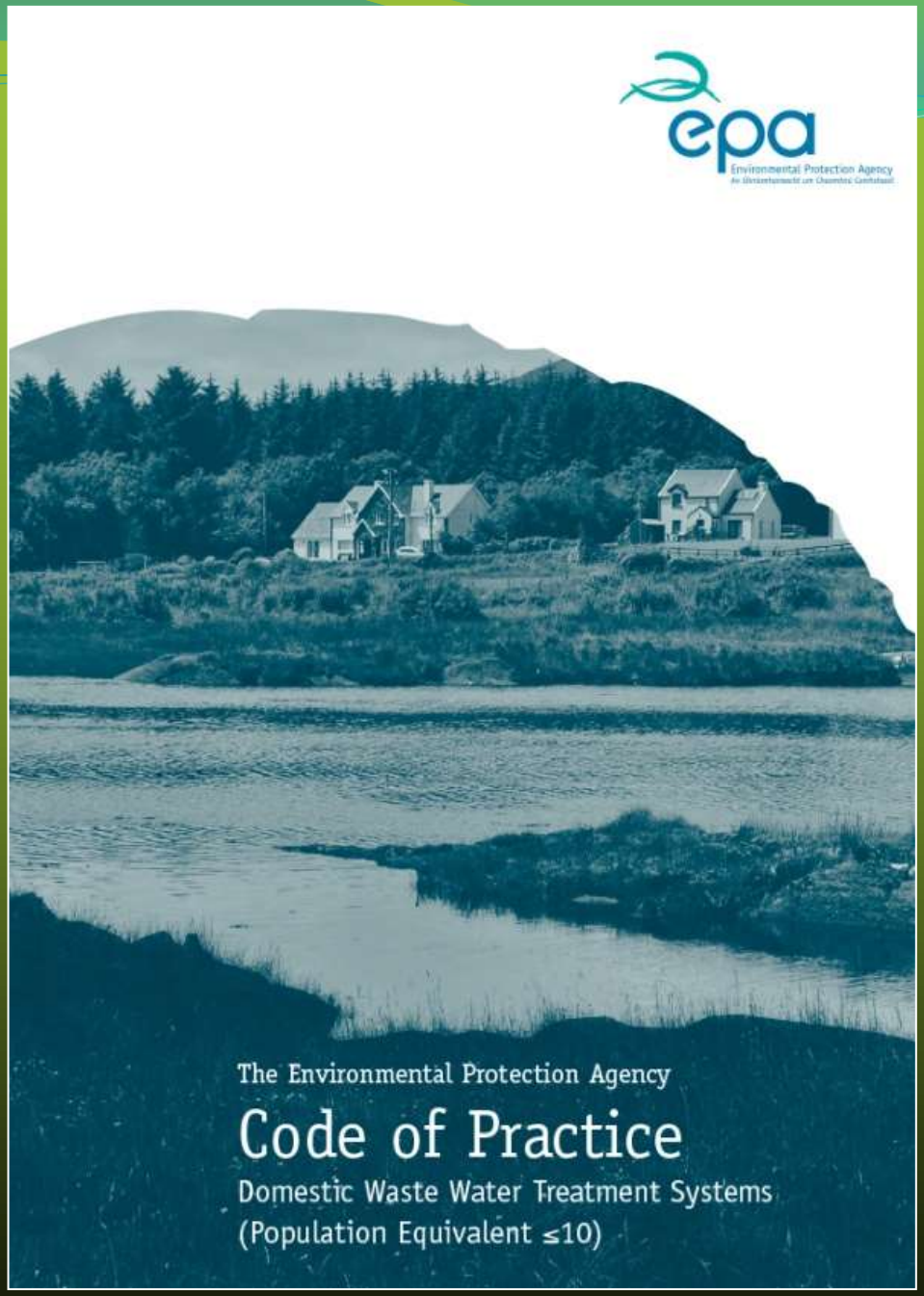
Percolation tests – existing houses and the potential for 'relaxing' separation distances …

- Public/group water supply abstraction points/wells – 60 m
- Down-gradient domestic well – 30 m to 60 m, depending on subsoil type and groundwater flow direction
- Alongside domestic well - 25 m
- Up-gradient domestic well – 15 m
- Karst feature – 15 m
- Lake or foreshore - 50 m
- Watercourse/stream - 10 m
- Open drain or drainage ditch - 10 m
- Surface water soakaways - 5 m
- Road - 4 m

- Slope break/cuts - 4 m

Percolation tests – existing houses and the potential for ‘relaxing’ separation distances …

- Own dwelling house – 10 m / 7 m
- Site boundaries - 3 m


epa
Environmental Protection Agency
The Environmental Protection Agency
Code of Practice
Domestic Waste Water Treatment Systems
(Population Equivalent ≤10)