

The murky world of sewage



Ali Morse, Water Policy nerd, Tweets: [@this_damselfly](https://twitter.com/this_damselfly)

Sewage Treatment

Urban wastewater from homes & businesses is collected, treated and discharged.

In England & Wales:

- >570,000kms sewers
- Nearly 26M properties
- 6,320 STWs





The Sewage Treatment Process

Large items like nappies, and even bricks!

Settlement tanks separate solids (sludge) and liquids (for further treatment)

Aeration supports 'good bacteria' to break down harmful bacteria

Tertiary treatment, e.g. to remove phosphate, EDCs, etc. UV, chemical, Filtration.

1 Taking the wastewater away

2 Screening the wastewater

3 Carrying out our primary treatment

4 Carrying out our secondary treatment

5 Carrying out our final treatment

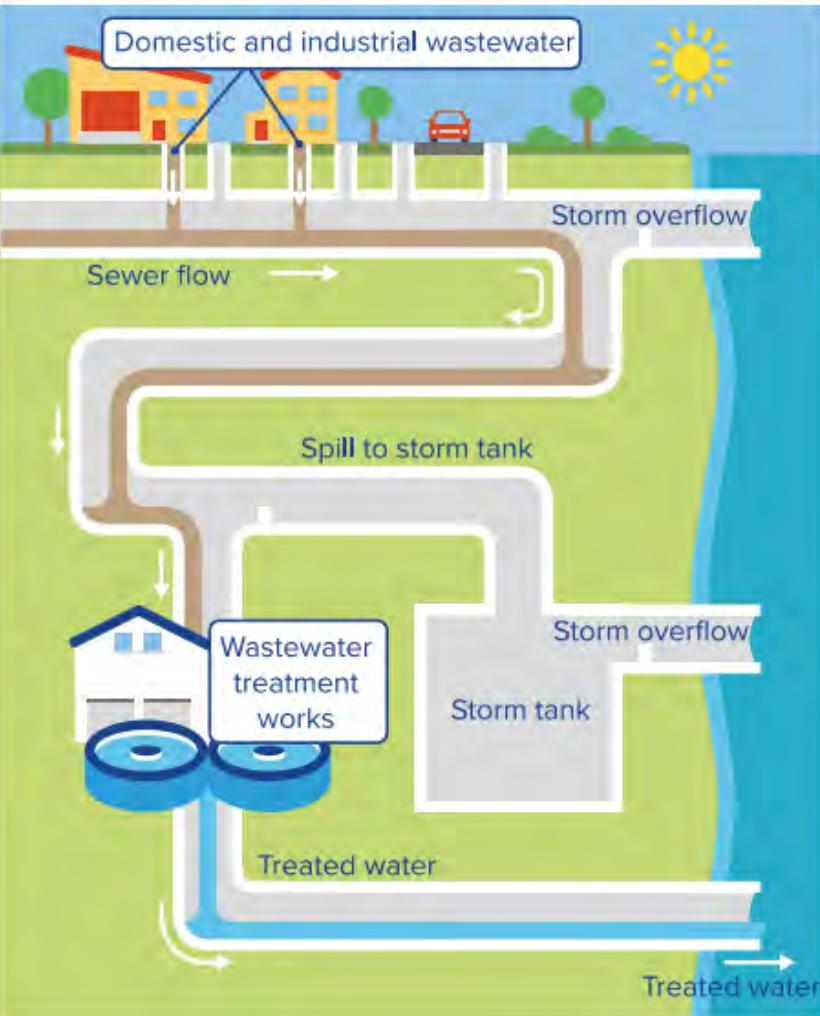
6 Generating power

7 Returning water to rivers and solids to land

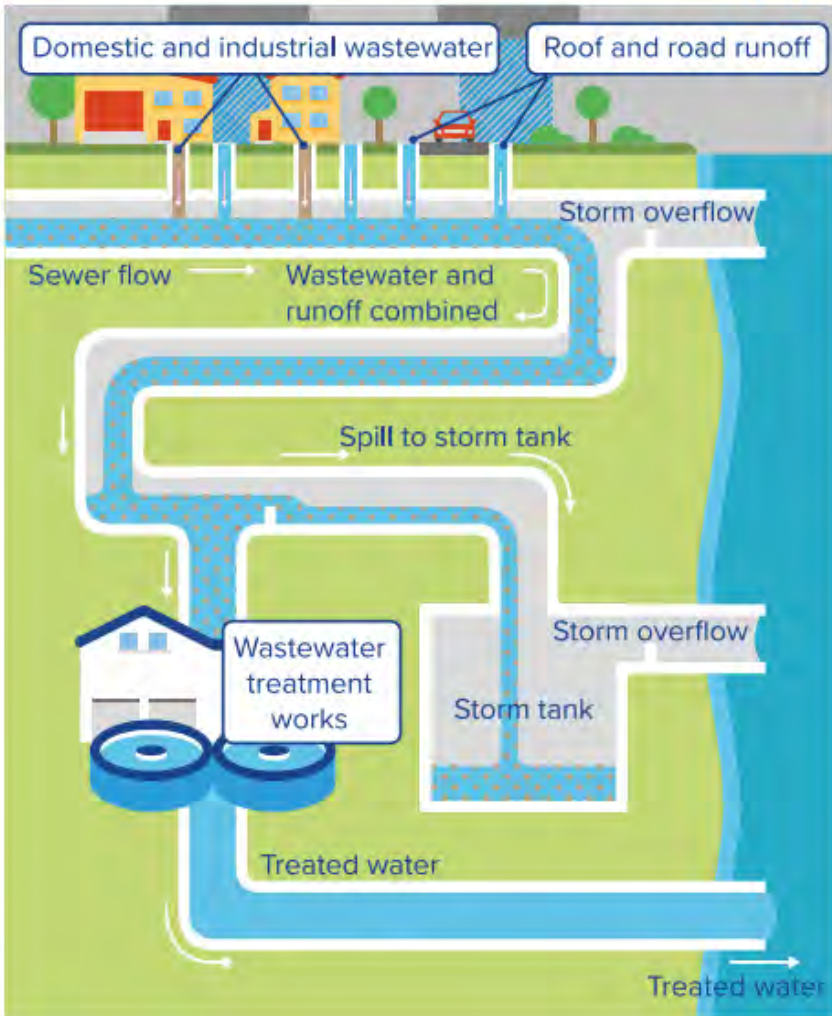
Sludge can be used to generate power (e.g. via anaerobic digestion, creating biogas) or is recycled to agricultural land.

Treated wastewater is returned to the environment.

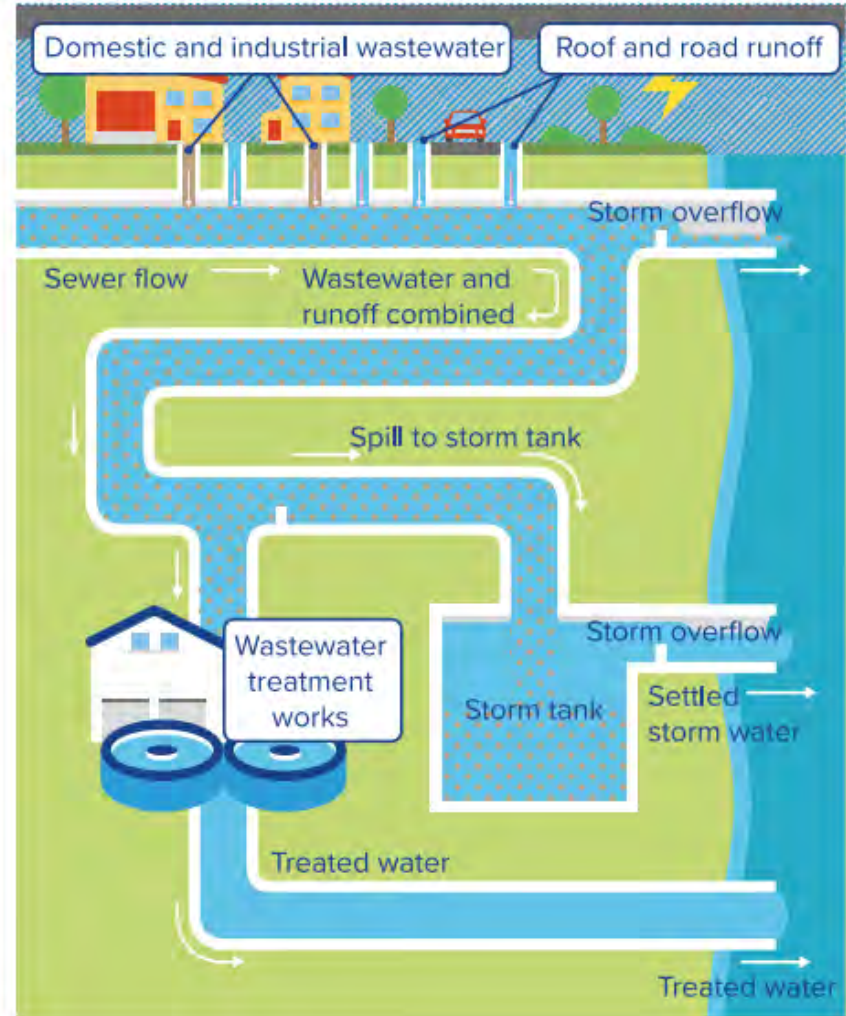
Dry conditions



Rainfall

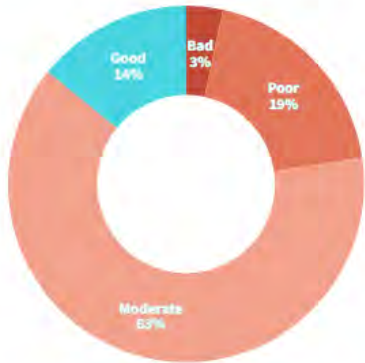


Heavier rainfall

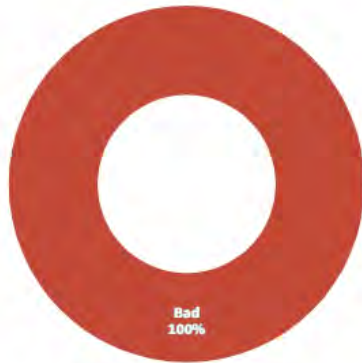


State of Our Rivers

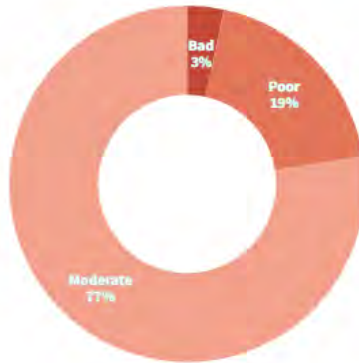
Ecological health



Chemical health



Overall health

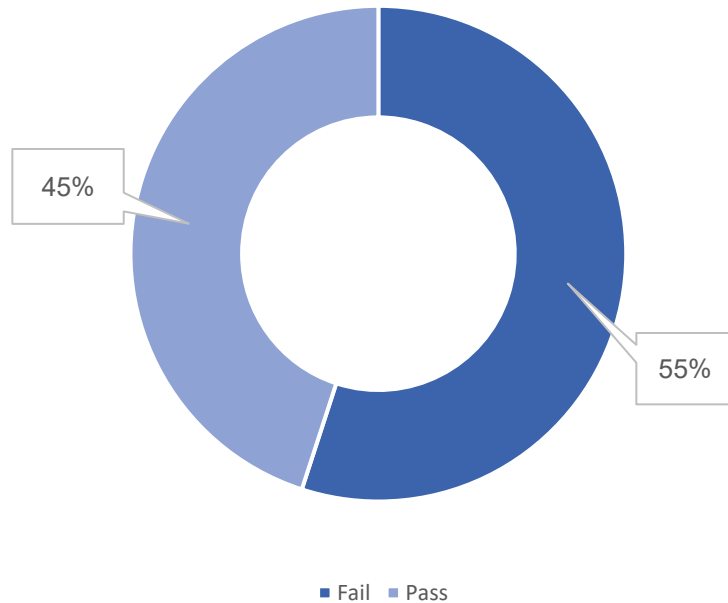


- **14%** of rivers are in good ecological health
- **No** rivers are in good chemical health
- **No** rivers are in good overall health

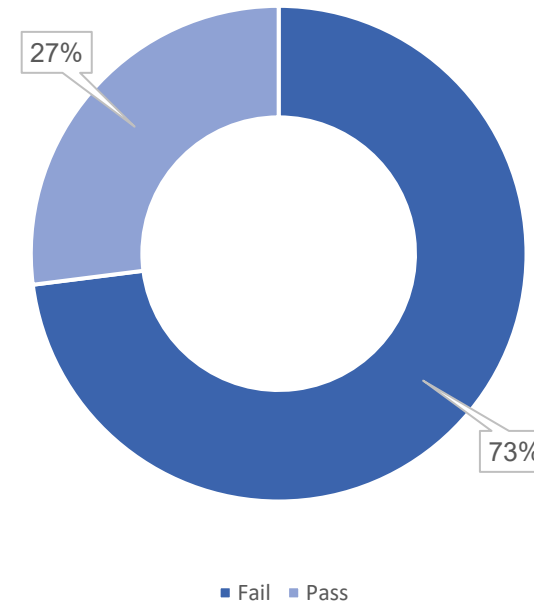


Phosphate in England's waters

Phosphate Standards: River Waterbodies



Phosphate Standards: Lake waterbodies



What does Phosphate do?

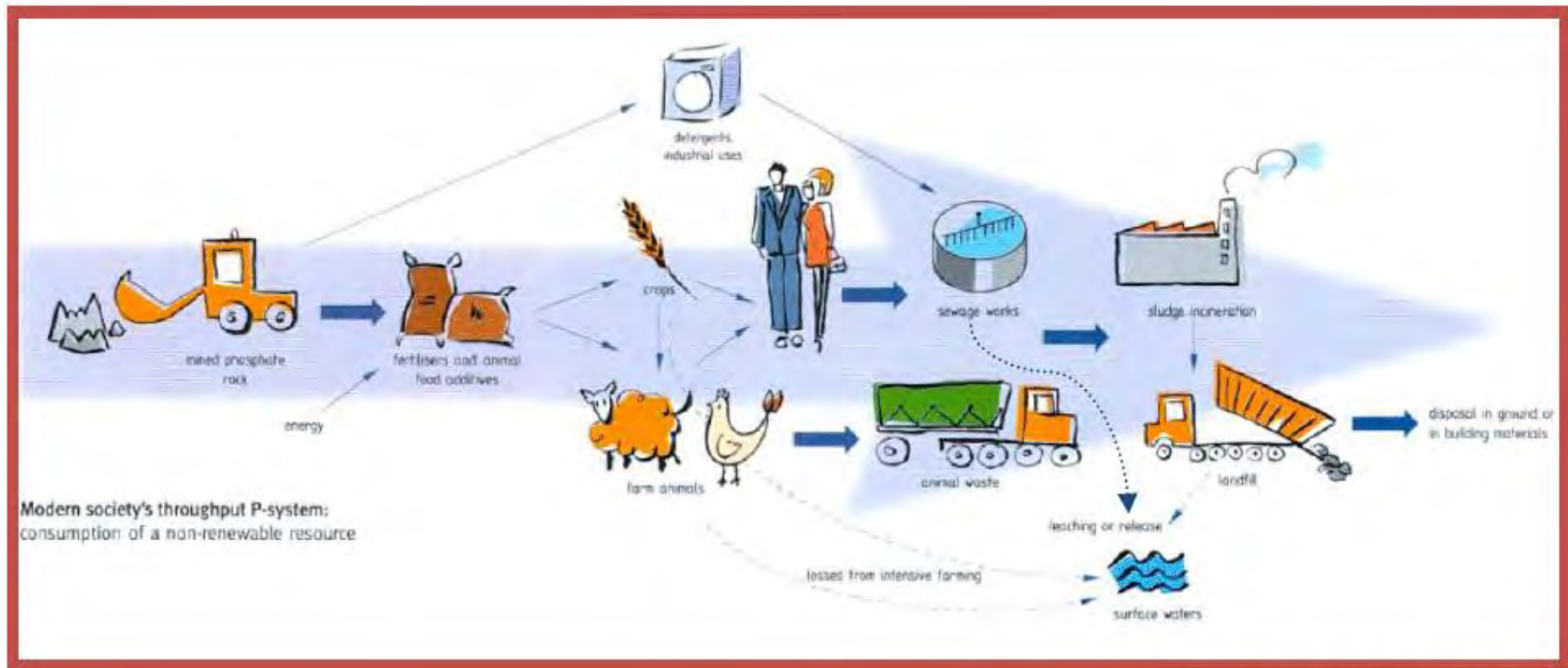


Eutrophication



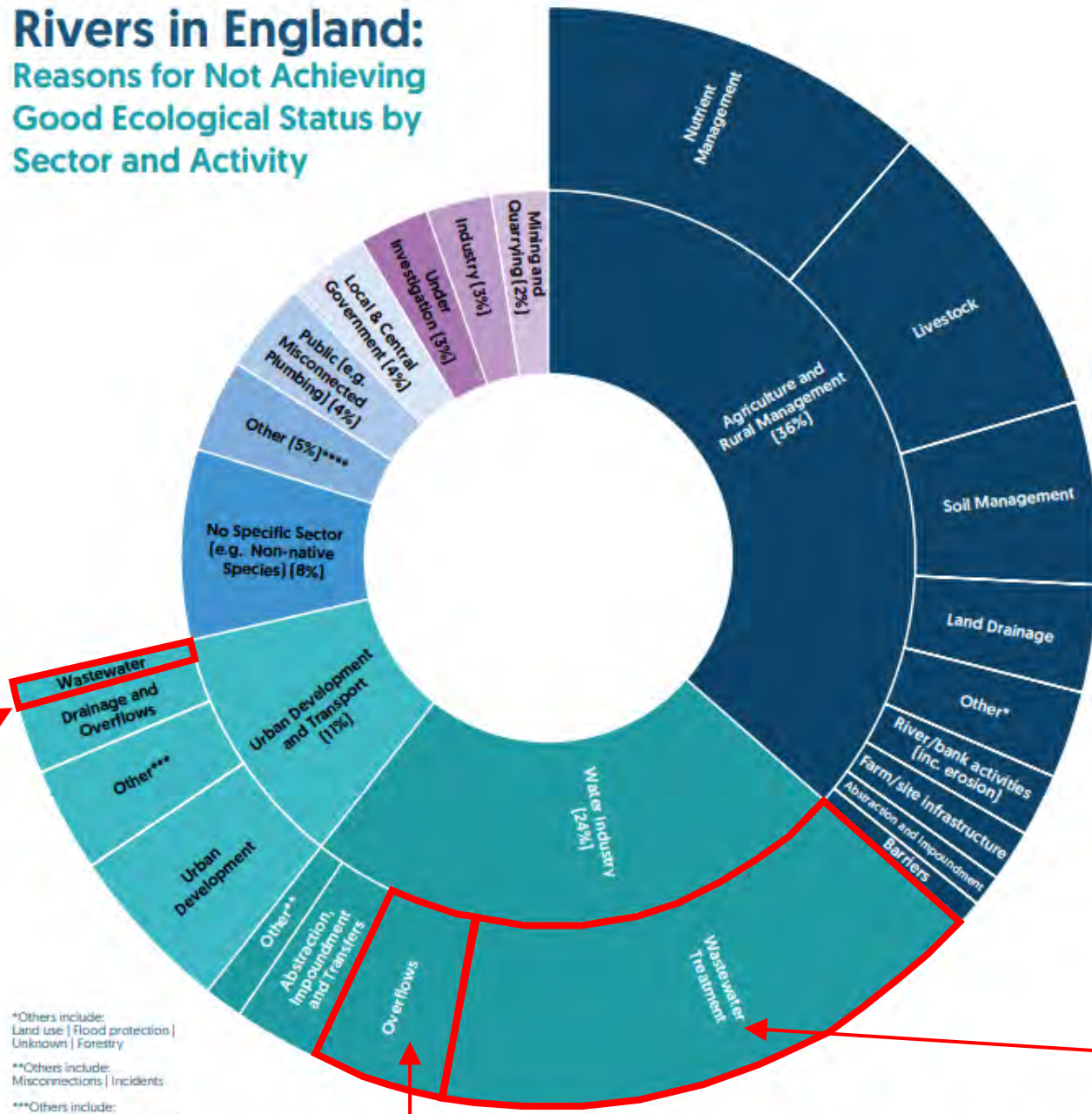
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Where does Phosphate come from?



Source: CEEP with addition

Rivers in England: Reasons for Not Achieving Good Ecological Status by Sector and Activity



Private Sewerage

Wastewater Drainage and Overflows

Storm Overflows

Wastewater Treatment Works

*Others include: Land use | Flood protection | Unknown | Forestry
 **Others include: Misconnections | Incidents
 ***Others include: Transport | Flood protection | Contaminated Land/River bed | Barriers | Unknown
 ****Others include: Navigation | Recreation | Waste

Source: The Environment Agency Catchment Data Explorer, September 2021

Types of Private Sewerage



SEPTIC TANKS are underground chambers where bacteria safely break down the waste. Solids sink to the bottom forming sludge and the liquid flows into a 'drainage field' where more bacteria treat it as it soaks into the ground. These systems must not discharge to watercourses.



SMALL SEWAGE TREATMENT PLANTS work in a similar way but use powered mechanical parts to aerate the bacteria. This makes them more effective at treating waste water and means they can discharge treated sewage into a soakaway or directly into flowing water.

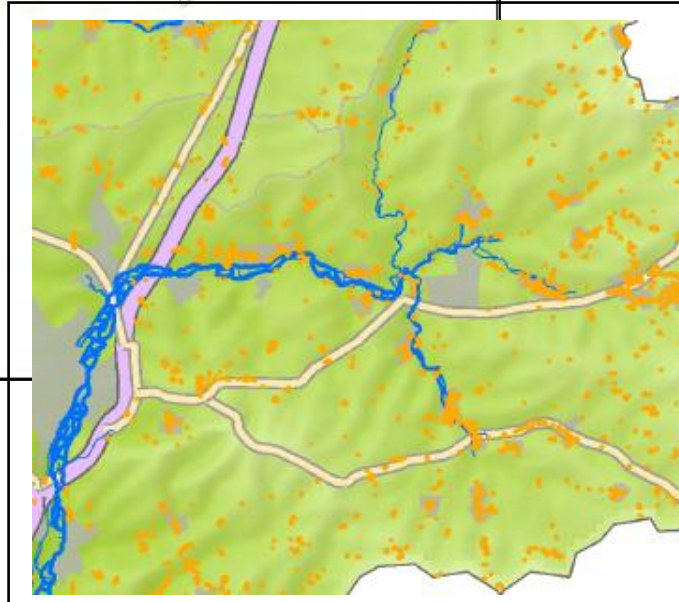
- These are both 'Small Sewage Discharges'.


Non-Mains Sewerage Project

Test & Itchen Catchment



0 3.5 7 14 Miles



 Properties on non-mains sewerage

A summary of Natural England’s
research on Small Sewage Discharges
and the risk to protected sites.

- Many septic tank systems do not function properly –being either incorrectly sited or improperly maintained (based on limited data)
- Empirical data supported cases where STs have a significant impact locally on downstream P concentration e.g. up to 700% increase
- SSDs can give rise to considerable ecological damage at a local scale
- At the catchment scale, impact is reduced but in some situations they may still affect the likelihood of meeting water quality targets

Location factors	Design factors	Management factors
Soil hydrological characteristics	Age of tank	Frequency of drainage field maintenance
Topography	Condition	Frequency of de-sludging
ST density	Receives run off	Use of appropriate household cleaning products
Proximity to watercourse	Size for household	

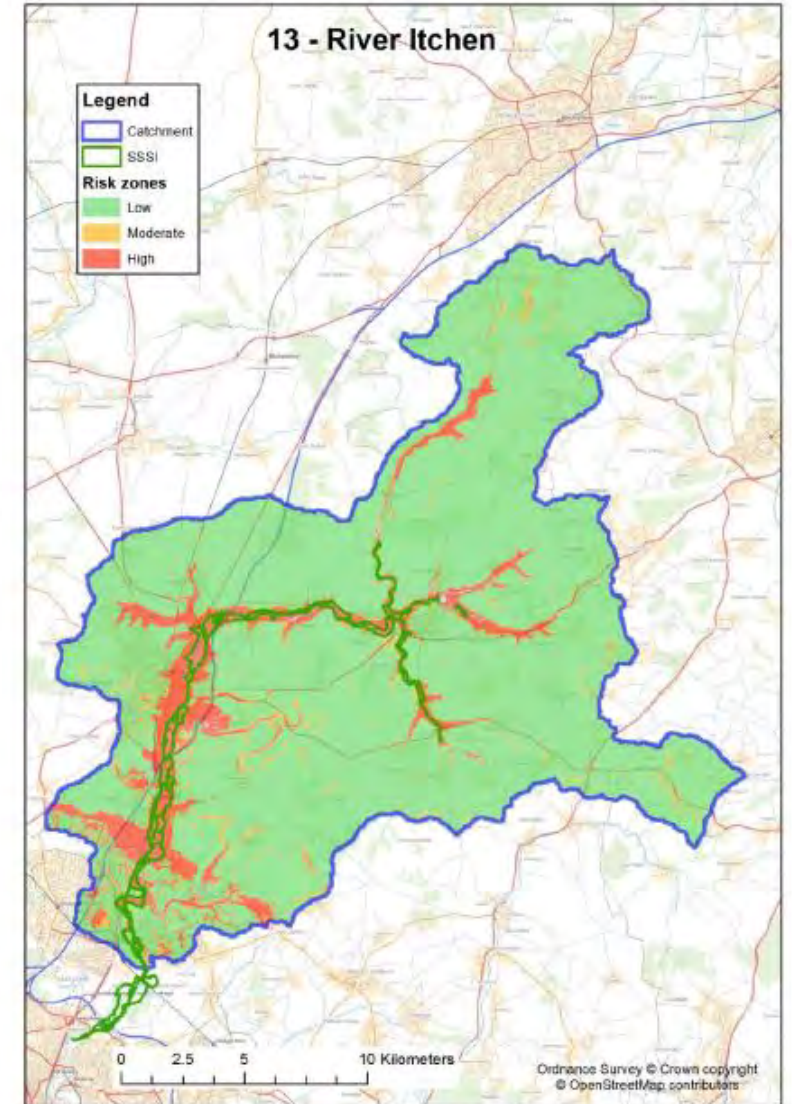


Figure 15 Catchment of the River Itchen SSSI showing high, moderate and low risk zones for locating small domestic discharges

General Binding Rules

<https://www.gov.uk/permits-you-need-for-septic-tanks>

Existing Discharges (pre '15)

- 2) 5m^3 discharge (to water)
- 3) Domestic only
- 4) Must not cause pollution
- 6) Septic tanks discharging to water
→ Foul sewer / replace with SSTP / drainage field to ground. Upgrade on sale.
- 9) Meet British Standard
- 10) Capacity

11) Regular maintenance

12) Regular emptying

13) Tell when you sell

New Discharges – also:

- 15) Connect to a foul sewer (in 30m)
- 16) Distance from protected sites & chalkstreams
- 19) Streams to have year-round flow

22 November 2019

We have made 2 changes for clarity under the heading 'Use the correct treatment system'.

1) We have stated that there may be other competent service engineers in addition to those on the list provided by British Water. 2) We have added: You cannot use a septic tank conversion unit or a reedbed for discharging effluent to a watercourse under the general binding rules.

25 October 2019

We've updated this guide. Your discharge must not cause pollution. If you have a septic tank that discharges directly to a watercourse you need to take action as soon as possible to make sure you meet requirements.

31 July 2019

This guide only applies to England. We added links to guides for Northern Ireland, Scotland and Wales.

4 July 2019

Updated the section on 'Building regulations and planning approval'. You must have building regulations approval if you have or are planning to install a new sewage treatment plant. You may also need planning permission.

25 June 2019

Updated the section on 'Rules for existing and new treatment systems' to make it clear that: You do not need to meet the British Standard requirement if your treatment system was installed before 1983. You must still meet all the other general binding rules.

5 July 2018

New sentence to clarify the rules for existing and new treatment systems: Where properties with septic tanks that discharge directly to surface water are sold before 1 January 2020, responsibility for the replacement or upgrade of the existing treatment system should be addressed between the buyer and seller as a condition of sale.

16 June 2015

First published.

- When do non-compliant septic tanks need to be upgraded by?
- Levelling Up & Regeneration Bill – likely establishment of a register.

Best Practice Guidelines

- Get to know your system**
Where is your tank? A metal or concrete lid should be visible, usually in the ground downhill from your property. Is it shared? Ask your neighbours. Where does it discharge to? Locate your soakaway. This gravel or grassed area cleans and filters the liquid effluent from your tank.
- Check your system**
Check that the soakaway isn't waterlogged, and that there are no pools of water running in to ditches or watercourses. Effluent inside the inspection chamber should be clear or pale, and odour-free.
- Don't upset the balance**
Using products marked as 'suitable for septic tanks' or 'environmentally friendly' will keep the bacteria in your tank healthy. The bacteria break down your waste, so the tank could cause health risks and environmental problems without them. Avoid harsh chemicals like bleach, caustic soda, disinfectants and anti-bacterials, and use cleaning products and detergents sparingly. Domestic sewage systems can't remove phosphates and use phosphate-free products will help to protect your local rivers and streams.
- Bin your waste**
Household waste can block or damage your system and should be binned instead of flushed. Kitchen towels, 'flushable' wipes, tissues, cotton buds, nappies and sanitary items will all block your tank or pipes leading to expensive repair bills. Oils, fat and grease will solidify and block pipes and soakaways. Use a kitchen sink strainer to prevent food waste filling up your tank, or it will need to be emptied more frequently. Paints, solvents and chemicals can kill your tank bacteria and should be disposed of at a civic amenity site. Medicines can also kill your bacteria.
- Don't over-water!**
Large volumes of water can overwhelm your tank. Flushing out untreated sewage. Ensure that roof gutters carrying rainwater aren't connected to your system, and avoid running dishwashers and washing machines several times in one day.
- Keep good records**
Keeping a record of maintenance, emptying and servicing will help contractors to fix any problems that arise, and will be useful if you want to sell your home.

General Binding Rules

These rules must be complied with by law

- Follow the law**
Calculate how much your system is discharging at www.gov.uk/small-sewage-rules - if you discharge more than 2,000 litres of treated sewage / day into the ground or 5,000 litres of flowing water, you will need a permit. If replacing or installing a new system, choose equipment that meets British Standard BS EN 12566 and speak to your local council to check that it will meet planning requirements and building regulations. You will also need to contact the Environment Agency to find out whether your new system will need a permit.
- Fix Faults**
Gurgling pipes, discoloured effluent, odours, foam, a swampy soakaway, lush grass growth, and sewage fungus (that looks like grey cotton wool) in local waterways can all indicate that your system isn't working properly. The most common problems are that tanks are blocked - these can be cleared with boiling water or drain rods. Problems with pipes are full and need to be emptied, or must be fixed immediately, preventing pollution, health risk, and escalating repair bills. Accredited engineers can fix more serious faults and carry out servicing.
- Get it emptied regularly**
All systems need to be emptied of sludge on a regular basis. Frequency will depend on levels of use, and on how well you treat your system, but having it emptied annually by a registered waste carrier will help to ensure that it functions properly and doesn't cause pollution.
- Buyer beware**
If you sell your property, you must inform the buyer in writing that it has a septic tank or small sewage treatment plant. Being able to provide them with records and a maintenance guide will reassure them that the system isn't a liability.

There are many thousands of private sewerage systems in the rural parts of southern England and their collective impact on local waters can be substantial. But following the 10 steps above can ensure that you're minimising the nitrogen, phosphorus and other pollutants invisibly entering our waters from your home. Take care of your tank, and avoid contributing to our rivers 'dirty secret'.

Department for Environment Food & Rural Affairs

Environment Agency

Your sewage - Your environment

Important information for households and businesses with septic tanks and small sewage treatment plants

A clean home shouldn't mean a dirty river

The 'gin clear' waters of the River Meon hide a dirty secret - Phosphate.

Naturally-occurring nutrients feed the crowfoot, water parsnip and watercress usually found growing in our streams. But in excess amounts, the plant nutrient phosphate acts as a pollutant. It can't be seen in the water, but it makes its presence plain by disrupting the habitat, allowing nutrient-hungry algae to out-compete aquatic plants, and in extreme cases, triggering algal blooms. When the algae die and are deposited as sediment, this can smother plants, and as they decompose, oxygen is used up causing suffocation of aquatic insects and fish. As well as threatening our Wildlife, these processes can prevent us from using and enjoying our waterways, threatening angling, water sports, shellfisheries, contributing to flood risk, and polluting the rivers from which we source our drinking water.

MEON VALLEY PARTNERSHIP
Catchment Based Approach
Partnerships for Action

Best Practice Guidelines

1

Get to know your system

Where is your tank? A metal or concrete lid should be visible, usually in the ground downhill from your property.

Is it shared? Ask your neighbours.

Where does it discharge to? Locate your soakaway.

This gravel or grassed area cleans and filters the liquid effluent from your tank.



2

Check your system

Check that the soakaway isn't waterlogged, and that there are no pools of water running in to ditches or watercourses. Effluent inside the inspection chamber should be clear or pale, and odour-free.



General Binding Rules

These rules must be complied with **by law**

- The rules are aimed at preventing pollution – check for: sewage smells, overflowing sludge, white scum / foam on the water.

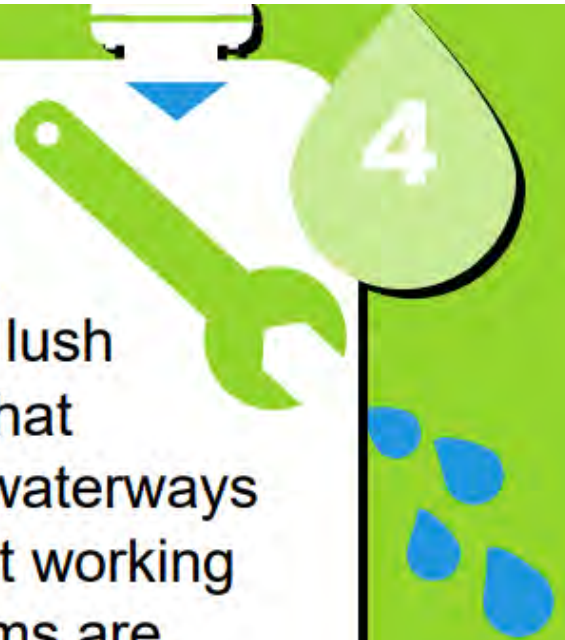
Calculate how much your system is discharging at www.gov.uk/small-sewage-rules - if you discharge more than 2,000 litres of treated sewage / day into the ground or 5,000 litres to flowing water, you will need a permit.

If replacing or installing a new system, choose equipment that meets British Standard BS EN 12566 and speak to your local council to check that it will meet planning requirements and building regulations. You will also need to contact the Environment Agency to find out whether your new system will need a permit.



Fix Faults

Gurgling pipes, discoloured effluent, odours, foam, a swampy soakaway, lush grass growth, and sewage fungus (that looks like grey cotton wool) in local waterways can all indicate that your system isn't working properly. The most common problems are that tanks are full and need to be emptied, or that pipes are blocked – these can be cleared with boiling water or drain rods. Problems must be fixed immediately, preventing pollution, health risk, and escalating repair bills. Accredited engineers can fix more serious faults and carry out servicing.



- British Water have a list of accredited service engineers

Get it emptied regularly

All systems need to be emptied of sludge on a regular basis. Frequency will depend on levels of use, and on how well you treat your system, but having it emptied annually by a registered waste carrier will help to ensure that it functions properly and doesn't cause pollution.



5

Companies disposing of waste must be registered waste carriers – ask to see their registered waste carriers certificate

6

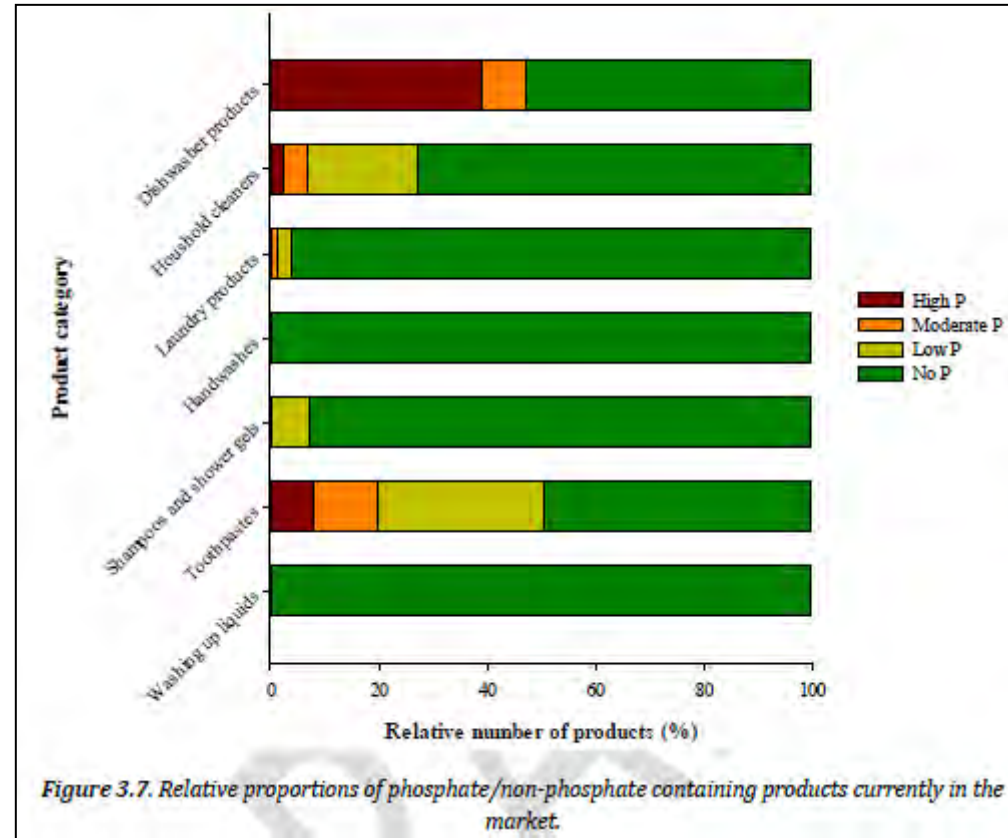
Don't upset the balance

Using products marked as 'suitable for septic tanks' or 'environmentally friendly' will keep the bacteria in your tank healthy. The bacteria break down your waste, so the tank could cause health risks and environmental problems without them. Avoid harsh chemicals like bleach, caustic soda, disinfectants and anti-bacterials, and use cleaning products and detergents sparingly.

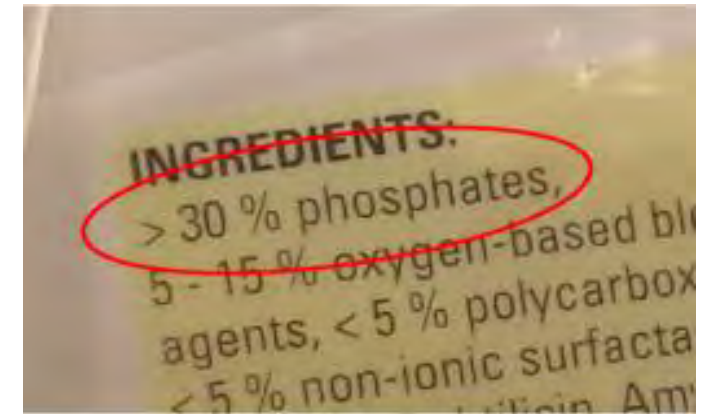
Domestic sewage systems can't remove phosphates from the effluent, so using phosphate-free products will help to protect your local rivers and streams.



Phosphates in domestic cleaning products



Eco products? Chlorine bleaches, plastics and polymers, toxic chemicals...
Ethical Consumer
Dishwasher Detergent review



7

Bin your waste

Household waste can block or damage your system and should be binned instead of flushed. Kitchen towels, 'flushable' wipes, tissues, cotton buds, nappies and sanitary items will all block your tank or pipes leading to expensive repair bills. Oils, fat and grease will solidify and block pipes and soakaways. Use a kitchen sink strainer to prevent food waste filling up your tank, or it will need to be emptied more frequently. Paints, solvents and chemicals can kill your tank bacteria and should be disposed of at a civic amenity site. Medicines can also kill your bacteria.



Keeping drains clear.

Helping your business avoid blocked pipes and sewer flooding.



Bin it - don't block it.

8

Don't over-water!

Large volumes of water can overwhelm your tank, flushing out untreated sewage. Ensure that roof gutters carrying rainwater aren't connected to your system, and avoid running dishwashers and washing machines several times in one day.



9

Keep good records

Keeping a record of maintenance, emptying and servicing will help contractors to fix any problems that arise, and will be useful if you want to sell your home.



“Dear Diary,...”?

Buyer beware

If you sell your property, you must inform the buyer in writing that it has a septic tank or small sewage treatment plant. Being able to provide them with records and a maintenance guide will reassure them that the system isn't a liability.

10

FOR
SALE



- Familiarise yourself with the General Binding Rules
- If you don't comply, consider improvements, or apply for a permit
- Contact the Environment Agency
- Follow the best practice guidelines: Be nice to your tank!



References

- Legal requirements - <https://www.gov.uk/permits-you-need-for-septic-tanks>
 - General Binding Rules: <https://www.gov.uk/government/publications/small-sewage-discharges-in-england-general-binding-rules>
 - Discharges to surface water <https://www.gov.uk/guidance/general-binding-rules-small-sewage-discharge-to-a-surface-water>
 - Discharges to groundwater <https://www.gov.uk/guidance/general-binding-rules-small-sewage-discharge-to-the-ground>
 - Apply for a Permit: <https://www.gov.uk/permits-you-need-for-septic-tanks/apply-for-a-permit>
- British Water Accredited Engineer list <https://www.britishwater.co.uk/page/ListofAccreditedServiceTechnicians>
- NE Report <http://planning.southkesteven.gov.uk/SKDC/S20-0383/1823861.pdf>
- Ethical Consumer Dishwasher Detergent Review <https://www.ethicalconsumer.org/home-garden/shopping-guide/ethical-dishwasher-detergent>
- State of our Rivers Report <https://theriverstrust.org/key-issues/state-of-our-rivers>
- Water UK '21st Century Rivers Report <https://www.water.org.uk/wp-content/uploads/2022/06/Water-UK-21st-Century-Rivers-download.pdf>
- Environment Agency WFD Data <https://environment.data.gov.uk/catchment-planning>