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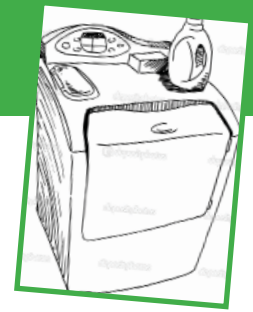
Code of Practice

A guide for users of Small Wastewater Treatment Systems (Package Plants)



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Please note: The environmental regulators the Environment Agency, the Environment and Heritage Service (Northern Ireland) and the Scottish Environment Protection Agency support the use of this code of practice, but the Agencies do not specifically endorse any particular manufacturer's product.



1. Scope

To provide background and general information for owners and users of small sewage or wastewater treatment systems (plant) to ensure that the system works satisfactorily to treat domestic wastewater (sewage) and so ensure that the treated effluent can be safely discharged to the environment and meets the regulators requirements.

2. Introduction

When taking a bath, using the washing machine or flushing the toilet few people stop to consider what happens to the wastewater and sewage. It simply goes down the drain or waste pipe and is no longer of any concern. But if the drains lead to a small wastewater treatment system then it is worth understanding what happens next to the sewage. If not then there is a risk that the safe and efficient operation of the treatment plant could be reduced with the risk of polluting the local environment and even facing possible prosecution as a result.

3. What is sewage?

Sewage is made up not of just the organic waste from toilets but also the chemicals and waste water from everyday activities such as washing, cleaning, cooking and washing clothes and dishes. The sewage from bathrooms, kitchens and toilets collects in a series of drains and flows into a sewer. In most households or commercial premises the sewage flows away through the sewers and is treated at a large-scale sewage treatment works, however, connection to a sewer is not always possible.

For houses and premises in remote or isolated locations where no mains drainage is available other options, such as cesspools or septic tanks, have traditionally been used but now the use of a package sewage treatment plant is increasingly preferred. Cesspools do not "treat" the sewage in any way and have to be emptied regularly. Although septic tanks provide some



partial treatment of the sewage the final effluent needs to be discharged through a network of special drains called a drainage field in which treatment of the sewage continues. It is vital a sufficient area of land is available, that ground conditions (permeability, groundwater level, etc.) are suitable so that waterlogging does not occur and that the site is away from watercourses and sources of drinking water and dwellings. Where these requirements are not met and if there are other regulatory restrictions, and this is increasingly so, then a package sewage treatment plant is the appropriate option.

A correctly designed, installed, and **maintained** package treatment plant will be able to meet the stringent standards now being set by the regulations. The Environmental Regulators Pollution Prevention Guidelines 4 **and the Environmental Permitting Regulations** provide comprehensive advice.

The owner of any non-mains sewage treatment system will require an **“exemption”**, or **“discharge permit”** (EA) or **“authorisation”** (SEPA) or **“consent to discharge”** (NIEA) from the local environmental regulator before the system can be installed. The environmental regulators are the Environment Agency (EA and formerly known as the National Rivers Authority) for England and Wales, the Scottish Environment Protection Agency (SEPA) for Scotland, and the Northern Ireland Environment Agency. British Water provides further guidance in its **“Guide to the Installation of Small Wastewater Treatment Systems”**.

4. Owners' responsibilities

Users of treatment systems have a responsibility under the relevant water related legislation to ensure that the plants meet the standards set by the regulators. A correctly designed, installed, and maintained system will provide a final effluent for discharging that meets these requirements.

Once the plant is commissioned and operating efficiently the environmental regulator may sample the discharge from the system to check that it meets the agreed standards. The environmental regulator also has the right to review and vary the discharge requirements that it sets. It is therefore essential to regularly maintain and service the system- this is necessary even during the first year. Failure to do so may also invalidate the manufacturers' warranty.

There are many straight forward actions that the user can take to ensure that the system gives a satisfactory performance in treating the sewage and safely

discharging the treated effluent to the environment. This code of practice offers a simple and practical guide to help achieve just that.

a. Preventative Maintenance and Servicing

All operation and maintenance must be carried out by suitably qualified and trained personnel and a British Water Accredited service engineer can be relied upon to ensure your package treatment plant functions in line with current regulations. Frequency of servicing should be undertaken in line with the system manufacturer's specification in the Operation and Maintenance manual. In the absence of other guidance, domestic residences may require servicing at least twice a year and commercial sites at least four times per year. Local site conditions and variations in loadings may affect servicing frequency so you should be guided by your maintenance provider with whom you have a service contract. They will assess the system's performance at each visit and make recommendations to you as necessary.

b. Choosing a Maintenance Provider

The UK Environment Agency¹ recommends entering into a Service Agreement with a reputable supplier with suitably qualified staff who are recognised by British Water as Accredited service engineers. Accredited service engineers are issued with a “Qualified Service Engineer” certificate and identity card which you can ask to see. These engineers have demonstrated through independent assessment that they are skilled in the servicing and repair of sewage treatment plants. Before entering into a Service Agreement with a provider, owners are advised to check the British Water web site for the current list of **“Accredited service engineers”**

c. Choosing a Service Agreement

Service Agreement terms and conditions vary across maintenance providers and you should consider carefully which type of agreement is suitable for you. Many providers will arrange a free site visit to assess the system's condition and explain its maintenance requirements to you before you enter into a maintenance contract with them.

d. Desludging (Emptying the System)

Your maintenance provider can arrange and oversee the desludging operation. Each manufacturer recommends desludging intervals for its systems and these should be followed. However you should also be guided by your



maintenance provider who may advise a variation from the standard desludging intervals but only where this is necessary to maintain optimal working of the system. More information is provided in the British Water '[Guide to the Desludging of Small Wastewater Treatment Systems](#)'.

e. Keeping Records and Transferring Ownership

Owners should ensure that the manufacturer's Operation and Maintenance manual and maintenance requirements are available when transferring responsibility for the operation of the system to a tenant or new owner. When it comes to resale, the operation manual and service history are as important for a sewage treatment system as they are for a vehicle. The Environmental Permitting Programme – 2nd Phase (EPP2) will require records of any system registered as 'exempt' to be kept for at least 5 years from the date of 'exemption' and to be made available upon request.

5. Do's and Don'ts

Do:

- ✓ think before putting anything down the sink, toilet or drains
- ✓ tell guests/visitors/staff that the drains do not flow into mains drainage but into a specialist sewage treatment system and tell them how to avoid harming it
- ✓ read the label and use the manufacturers' recommended doses for all household cleaning products
- ✓ use cleaning products little and often so the system isn't overloaded
- ✓ spread clothes washing throughout the week
- ✓ use the same washing and dishwasher detergents and other cleaning products as being consistent will help the bacteria in the system to work more efficiently, if the products in the sewage do not vary widely the bacteria can adapt to remove a wide range of products but as this can take a while the operation of the treatment system will be more consistent if the variability of the sewage is minimised
- ✓ use liquid cleaners for clothes washing and for dishwashers
- ✓ separately dispose of sanitary towels, tampons, disposable nappies, baby wipes, cotton wool, incontinence pads, etc. and not down the toilet
- ✓ take out a maintenance and service contract

Don't:

- ✓ spring clean and use large amounts of cleaners and chemicals in one day
- ✓ have a "washing day" – spread the washing throughout the week
- ✓ use household bleach and other strong chemicals indiscriminately
- ✓ keep changing the brands of household cleaners and washing powders
- ✓ tip bottles of medicine, mouth wash, etc. down the toilet
- ✓ put sanitary towels, tampons, disposable nappies, baby wipes, cotton wool, incontinence pads, etc. down the toilet
- ✓ over flush the toilet unnecessarily – use a water-saving flush if it's fitted
- ✓ pour fat or grease from cooking or oil from the chip pan down the sink or drains
- ✓ use the waste disposal unit like a rubbish bin, use it sparingly if at all
- ✓ pour garden chemicals or car engine oil down the drains

6. Use of cleaning products

To minimise the quantity of laundry detergents and cleaning products used it will be best to find out how hard the water is. Hard water is rich in calcium and other minerals which reduce the effectiveness of soap and detergents. Water hardness is determined by measuring the amount of calcium in the water. This value can be obtained from the local water company (see reverse of Water Bill or directory for telephone number) unless you are on your own private water supply, in which case contact your water treatment equipment supplier. Water can be soft to very hard and the table below shows levels of calcium and calcium carbonate which correspond to the different levels of hardness. In line with EC recommendations, all fabric washing products now carry advice on how much to use according to the water hardness. So, once the hardness of the water supply has been obtained the amount of detergent to use can be determined from the manufacturers' recommendations. If in doubt phone the manufacturer for advice – most offer a customer-care phone service.

a. Laundry detergents

It is best to minimise the amount of detergent used to



limit its impact on the treatment system whilst ensuring that the best washing results are obtained.

- Use of washing liquids in an in-machine ball dispenser is preferred to powders. Best results are obtained from having the liquid in the heart of the wash, it is already in suspension and therefore “gets to work” quickly and none is left in the dispenser. For normal “coloured” washes try to use a washing product without added bleach. For white washes add a separate bleach formulated to minimise its environmental impact.
- Read the “instructions for use” and ensure that the correct dosage is used for the level of hardness of the water and to match the level of dirtiness of the washing. Particular care is needed with “concentrated” or “compact” liquids or powders as it is easy to accidentally use too much.
- Try to ensure that a full load is used each time or use an energy-saving “half load” programme if there is one. Don’t be tempted to overload as this will not produce a good wash and could damage the machine in the longer term. A correctly loaded machine should have enough space for the liquid ball to be readily placed on top of the washing.
- Normal wash temperatures, with the occasional very hot or “boil” wash, are not a problem for the treatment plant. However, try to avoid regular or repeated very hot washes as this could raise the plant temperature and affect the bacterial process.
- The washing machine produces the largest quantity of waste water that the treatment system has to deal with in a short space of time. If possible avoid having a “wash day” as this could produce too much water for the system to cope with satisfactorily at any one time. Try to spread the washing throughout the week.
- As laundry detergents can inhibit biological treatment and so reduce the effectiveness of a treatment system it is important to keep detergent use to the minimum necessary. In some larger applications, eg nursing homes it is especially important to be aware of the amount of laundry waste as a percentage of the total normal flow, this should have influenced the sizing of the treatment plant (see Design Code of Practice Flows and Loads 2). It is worth noting that discharge quality may be improved if detergents with a low environmental impact are used, eg low phosphate content.

b. Dishwasher products

The dishwasher detergent is probably the most

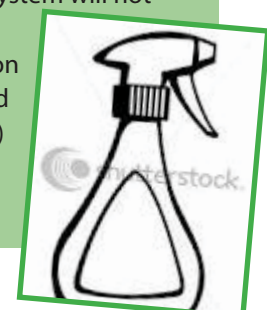
“aggressive” cleaning product in any household. It needs to be so that it is effective and not only to make greasy plates sparkling and “squeaky” clean as the advertisers promise.

- It is therefore all the more important that sewage treatment system owners are careful and only use the manufacturers’ recommended dosage. It is recommended that a liquid detergent is used, rather than a powder or tablet cleaner as the dosing can be adjusted more easily.
- Most dishwashers use a salt-based water softener – ensure that the salt dispenser is always topped up because softened water increases the efficiency of cleaning products so enabling only the minimum dosage to be used.
- Some dishwasher manufacturers now recommend that dishes, etc are not rinsed under the hot tap before putting it in the dishwasher. Although this is traditionally common practice dishwashers and their cleaning products are now so effective that it is unnecessary and merely wastes hot water, energy and time and unnecessarily increases the flow of wastewater to the treatment system.

c. Other cleaning products

It is most important to always follow the manufacturers’ recommended dosage and instructions on all household cleaning products.

- Read the label and don’t be tempted to use guesswork.
- Try to avoid using large amounts of cleaning products at any one time.
- If the dosage recommendations are followed and only small quantities are used on a regular basis they should not have any adverse effect on the treatment system.
- However, a day’s spring cleaning using massive amounts of household cleaners and disinfectants indiscriminately will affect the efficiency of the system and destroy some of the bacteria. If the bacteria are harmed or killed the system will not operate properly for a while, some will survive (numbers depending on the amount of chemicals used) and grow, eventually (in days or weeks) the system will be returned to normal effectiveness.





7. Impact of other domestic equipment

a. Water softeners

To minimise the quantity of laundry detergents used it will be best to find out how hard the water is and to adjust the dosage accordingly. To help minimise the quantity of detergents used (soaps and household cleaning agents as well) – and save money – a separate water softener could be installed.

As with all equipment, when using water softeners the manufacturers' instructions should be followed, especially as regards sizing, operation and installation. All domestic and commercial water softeners involve a salt regeneration process and salt in high concentrations can be harmful to biological treatment systems. When the softener regenerates a concentrated salt solution is used and there is a small possibility that this could affect the performance of the sewage treatment system. However, if the softening equipment is correctly sized and installed and the package treatment plant is designed and sized correctly, with the knowledge that a water softener will discharge into it, then there should not be a problem with the treatment plant and it should perform satisfactorily.

b. Waste disposal units

Depending on how frequently they are used, they can add a considerable extra load to the treatment system from the macerated vegetable wastes and other degradable organic material. It would be preferable to compost the vegetable peelings (it is cheaper and more environmentally friendly) and dispose of non-vegetable waste via another route.

8. Chemicals and products to be avoided

At all times there should be a cautious and careful use of all substances, chemicals and cleaning products within the home and wherever drains flow into the sewage treatment system. The manufacturers' use instructions should always be closely followed. The following products can all significantly and adversely affect the operation and efficiency of sewage treatment plants and so putting them down the sink, toilets or drains should be avoided if at all possible:

- external cleaning agents and disinfectants
- cooking oil or melted fat e.g. from a grill tray or chip pan
- medicines
- dairy waste



- motor oils, antifreeze or other car products
- garden chemicals such as pesticides, preservatives, weed killers or fertilisers
- DIY products such as paints, white spirit, paint thinners and other solvents, glue
- swimming pool water

This list cannot be totally comprehensive or exhaustive - just be careful and cautious before discarding any chemicals into the system - if in any doubt always responsibly dispose of it elsewhere.

Where cleaning agents are used for hygienic reasons obviously follow the use instructions but if possible spread out their use so that small amounts enter the treatment system at any one time, eg clean toilets on separate days rather than all on the same day. Do select and use the most appropriate product bearing in mind the impact that it may have on the sewage treatment system and the environment².

9. Health & Safety

Before beginning any work on the plant ensure familiarity with all of the Health & Safety advice given in the Operation & Maintenance Manual. All operations and maintenance must be carried out by suitably trained and qualified personnel. See '[Choosing a Maintenance Provider](#)'. In particular note the following:

- Gases given off by sewage are potentially toxic and explosive. Do not enter any below ground compartments of a sewage treatment system.
- When the lid or cover is removed from the system there is a danger of deep water and the unit should not be left unattended. Put up temporary barriers and warning signs around any open covers or manholes and try to keep the amount of time the cover is removed to a minimum. Remember small children may not read or understand the signs, pets certainly will not.
- The equipment must be electrically isolated before any maintenance work is carried out.

10. Health Warning – Leptospirosis

Two types of Leptospirosis affect people in the UK:-

- Weil's Disease which is a serious infection

transmitted to humans by contact with soil, water or sewage which has been contaminated with urine from infected rats.

- Hardjo-type Leptospirosis which is transmitted from cattle to humans.

Bacteria from both diseases can enter the body through cuts and scratches and through the lining of the mouth, throat and eyes. Typical symptoms start with a flu-like illness with a persistent and severe headache, muscle pains and vomiting, jaundice appears on about the fourth day of illness.

Sensible precautions which should be taken are:

- After working with sewage or anything contaminated with sewage wash hands and forearms thoroughly with soap and water. If clothing or boots are contaminated wash thoroughly after handling them.
- Always wash any cut or scratch thoroughly and quickly before applying a plaster, bandage or other protective covering.
- Always wash hands thoroughly before handling food, drink, cigarettes, cigars etc.
- If after coming into contact with sewage an illness with any of the above symptoms develops see a doctor immediately. Be sure to tell him/her of the contact with sewage as this could be an important help to the correct diagnosis of the illness

Please note:

- 1.Guidance on the selection of the most appropriate option for non-mains sewage treatment and the use of accredited service engineers is recommended in the UK Environment Agency's Pollution Prevention Guidelines Number 4 (PPG 4) which is available at:<http://publications.environment-agency.gov.uk/pdf/PMHO0706BJGL-E-E.pdf>
- 2.Guidance on the discharge of chemicals to groundwater is provided in the following Code of Practice:<http://www.defra.gov.uk/environment/water/ground/pdf/groundwater-guidance.pdf>
- 3.The sewage treatment system should be sized in accordance with the British Water design Code of Practice Flows and Loads 3 which can be downloaded fromhttp://www.britishwater.co.uk/publications/publications_and_technical_guides.aspx

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