



sewage treatment plants

Sewage treatment plants allow you to treat waste before discharging it into a local watercourse, and are often the best way to meet the discharge limits imposed by the Environment Agency. To run one, you'll need a permit from the Environment Agency, as well as an electricity supply.

how it works

Sewage treatment plants create an artificial environment to speed up the natural process of breaking down the pollutants in sewage. The treated effluent can then be safely discharged into a local watercourse or soakaway system.

There are three main process types:

- Rotating biological contactor (RBC)
- Aerated filter
- Submerged aerated media (SAM)

Although each works in different ways, they all have three core treatment stages:

primary treatment

Solid matter (sludge) separates from liquid waste and settles at the bottom of the primary settlement tanks, while lighter material forms a layer of scum on the top of the liquid. Sludge and scum need to be removed regularly by a vacuum tanker, and will then be disposed of at a large municipal wastewater treatment works.

If it's not removed, the sludge will build up and eventually carry over into the secondary treatment stage, where it could interfere with the biological process, block the biological filter or pollute the watercourse or soakaway. Putting this right can be really expensive, so don't wait until things go wrong before you give us a call.

secondary treatment

The remaining liquid is broken down by live, naturally occurring micro-organisms (biomass) until the quality is high enough for it to be safely discharged to a watercourse or soakaway. The biomass is fed with oxygen to speed up the digestion process.

final settlement

This final stage allows the contents of the humus tank to settle out. Where discharge consent is more stringent, tertiary treatment is likely. This adds significantly to overall process costs, e.g. nitrification units, sand filters, reed beds etc. Not forgetting the need for more frequent tanker de-sludging.

final disposal

If a watercourse is available and you've been given permission by the Environment Agency, this is the simplest way to dispose of the treated effluent. At the moment the most common consent issued is:

BOD (biological oxygen demand)	20mg/l
SS (total suspended solids)	30mg/l
Ammonia	20mg/l

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maintaining the system

Regular tanker visits are essential to prevent sludge and scum building up in the tank. Equally as important is having the system maintained by a properly trained engineer. Serious engineers are British Water accredited.

Day to day, you'll need to keep the system and electrics well looked after – we recommend you get into the habit of inspecting the plant every day to check everything's working properly. It's crucial the electricity supply is never turned off, as this will stop the treatment from working.

when it all goes wrong

Neglect your plant at your peril. Not only will the consequences be unpleasant, if you pollute the surrounding area you could face prosecution and some serious fines.

If the biomass is harmed, it will usually recover with time and patience. But until it does, you'll have to live with a pretty foul smell. Prevention is definitely better than cure.

troubleshooting

What's happening	Possible causes
No crust layer in primary tank	Hydraulic overload causing scouring Inlet / outlet dip pipe missing Secondary sludge return (SSR) connected directly to the primary tank instead of the inlet manhole
Heavy crust layer in second compartment of primary tank	Tank needs de-sludging Baffle missing or damaged
No biological growth in the biozone	Chemical toxicity
White filamentous biological growth in biozone	Plant overloaded Insufficient oxygen
Uneven distribution of biomass on the surface of a filter bed	Blocked distribution system
Unpleasant odour from the biozone	Plant overloaded Insufficient oxygen
Poor bubble pattern over submerged media	Blocked distribution system
Head loss through the biozone	Blocked media, caused by primary sludges being carried over or overgrowth of biomass
No aeration / distribution	Ineffective or failed SSR system Can also indicate high plant performance-denitrification, causing gassing and rapid rise of settled humus solid
Floating sludge in the humus tank	Pump / blower not functioning
High suspended solids in an otherwise good effluent	Failed / ineffective SSR system

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the sewage treatment plant owner's guide to...



washing machine and dishwasher detergents and washing-up liquid

These are generally fine in normal domestic use and in normal concentrations. You might have a problem if you run a hotel or nursing home and your washing machine's in constant use, or if, for instance, you volunteer to wash kits for your local rugby team. The enzymes in biological powders can break down the biomass, so swap them for non-biological ones. Try to spread your washes out too, rather than doing a few loads one after the other.

floor cleaners, disinfectants and bleaches

These are fine as long as you follow the manufacturer's recommendations and use the minimum concentrations. Don't pour neat disinfectant or bleach down sinks or outside gullies. If these are smelly the cause is usually a build-up of decaying material or a plumbing problem, so investigate and deal with the problem accordingly.

nappy disinfectants and sterilising fluids

These are fine to dispose of as long as they're diluted with plenty of water. The easiest way to do this is simply to flush it down the toilet.

waste-disposal units

These can unbalance the biomass and, depending on how you use them, can put extra strain on the treatment plant, potentially leading to problems. It's far better (and greener) to compost vegetable peelings and other food waste.

home beer and wine making

One pint of beer tipped down the sink will make your plant work as hard as 24 hours' worth of normal human waste. If it isn't fit to drink, flush it down the loo or dilute it with plenty of water.



what not to flush

Your treatment plant won't be able to cope with any of the items here, so find another way to dispose of them.

- Motor oil, grease, anti-freeze or brake fluid
- Cooking oil and fat
- Weed killers, insecticides, fungicides or other gardening chemicals
- Paint, thinners, white spirit, turpentine or creosote
- Medicines – ask your pharmacist to dispose of them for you
- Chemical toilet waste
- Photo-developing fluids
- Disposable nappies, sanitary towels and tampons, cleaning cloths and rags

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