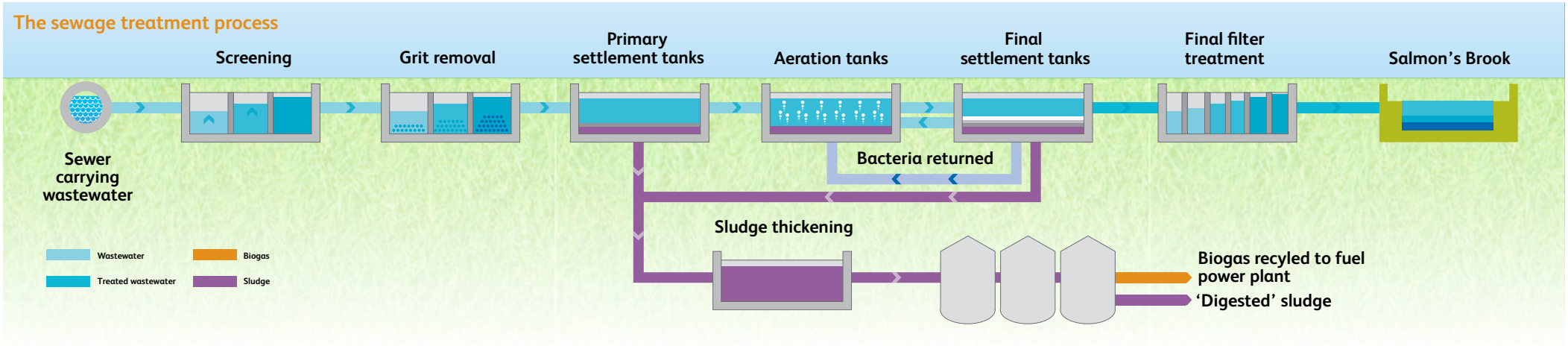
Find out about

- How we treat your sewage
- Potential treatment options we are looking at in more detail

Treatment options

When the wastewater from your toilet, shower and sink leaves your home, it flows into our network of sewers and eventually reaches a sewage works where it is treated. The treatment process involves several different stages to make sure the treated wastewater meets the quality standards set by the Environment Agency and can safely flow into a nearby river.

The sewage treatment process



Screening

The first stage of the process is to screen the sewage arriving at the sewage works to remove all the rags and larger objects that cannot be broken down biologically in the treatment process. These include bricks, bottles and nappies, which could block or damage the treatment equipment. This is followed by a further treatment stage to remove any grit.

Primary treatment

The sewage then passes into large settlement tanks. The heavy solid waste settles to the bottom of the tanks and is removed for treatment later on (see 'Sludge treatment' below). Oils and grease present in the sewage float to the top of the tanks and are skimmed off the surface. The sewage then passes on to the next stage.

Secondary treatment

At this stage, any lighter solid particles are removed from the sewage. We do this by either pumping air through the sewage in large tanks to encourage bacteria to grow and break down the solid particles, or by sucking the sewage through very fine filters.

We have looked at a number of different secondary treatment options for the Deephams Sewage Works Upgrade and selected four to consider in more detail (See 'Secondary treatment options').

Final treatment

The sewage then passes into a final set of large settlement tanks where any bacteria or other tiny particles left over from the previous stages settle to the bottom of the tank and are either recycled to the secondary treatment stage or removed for treatment (see 'Sludge treatment').

If the river that the treated wastewater will be put back into is particularly sensitive, a further treatment stage is needed where the treated wastewater is filtered to catch any small solid particles before it is returned to the river. This is called tertiary treatment.

Sludge treatment

The solid waste that settled to the bottom of the tanks in the earlier stages is called 'sludge'. We treat the sludge to make it safe and put it to good use.

Sludge is treated before being recycled as fertiliser on farm land. To treat the sludge we heat it, which kills bacteria and produces 'biogas' that can either be used to make electricity on site or treated to a higher standard and added to the national gas grid.

Back to the river

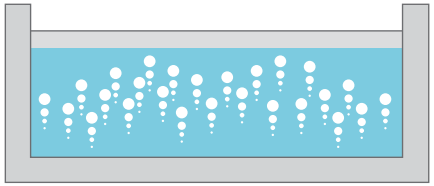
The final stage of the sewage treatment process is to return the treated wastewater to a nearby river. The quality of the water is tested to make sure it meets the high water quality standards set by the Environment Agency.

Deephams Sewage Works Upgrade
Creating a cleaner, healthier River Lee

Thames Water

Secondary treatment options

To make sure the Deephams Sewage Works Upgrade is as effective and sustainable as possible, we have looked at a number of different options for the secondary stage of the treatment process. We have looked in more detail at the four technology options below, but we will review these options again and base our decisions on preferred treatment options on feedback from this consultation and expert advice from the contractors we will employ to build the upgrade.

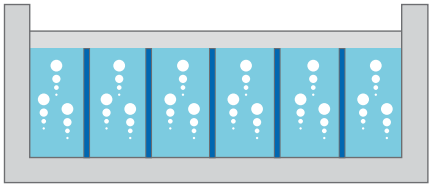


1. Conventional activated sludge

The wastewater left over from the primary treatment stage is put into large rectangular tanks and air is pumped through it to encourage bacteria to eat and break down the harmful bacteria.

This is the most common treatment option at large sewage works worldwide and is the process we currently use at the Deephams Sewage Works.

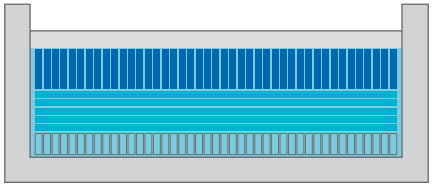
It is the cheapest to run and uses the lowest amount of energy compared to the other options, but it also needs the largest amount of land for treatment tanks.



2. Integrated fixed-film activated sludge

This process is very similar to conventional activated sludge. The bacteria are encouraged to grow closer together on films that float within the rectangular tanks, allowing the same level of treatment to be provided in smaller tanks.

This means that less land is needed than for conventional activated sludge, as the treatment tanks can be smaller, but the process uses more energy and so is slightly more expensive to run than for conventional activated sludge.

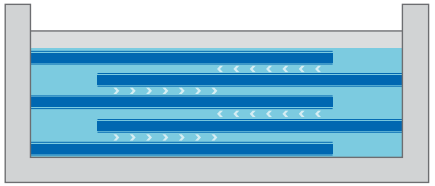


3. Biological aerated flooded filter

This is also a very similar process to conventional activated sludge. The sewage is passed through filters containing the bacteria, which significantly reduces the size of the tanks needed for treatment. .

This means that less land is needed, but the process is more expensive to run than the previous two options because more energy is used to pump the sewage through the filters.

Several stages of this treatment process would be needed to meet the new treated wastewater standard set by the Environment Agency (see the ‘Why we need the upgrade’ leaflet), further increasing the costs of this option.



4. Membrane bio-reactor

The wastewater left over from the primary treatment stage is sucked through a series of very fine filters, or membranes, to separate the water from any other particles and bacteria in the sewage.

The tanks needed for this process are a lot smaller than for other options, and so need the least amount of land, but the process is the most expensive to run because the membranes need to be replaced frequently.

This option has not previously been used on the same scale at any other sewage works to treat the large amount of sewage that would be need to be treated by the Deephams Sewage Works Upgrade.