Severn Trent Water

Rotating Biological Contactor (RBC)

package plant

sewage treatment units

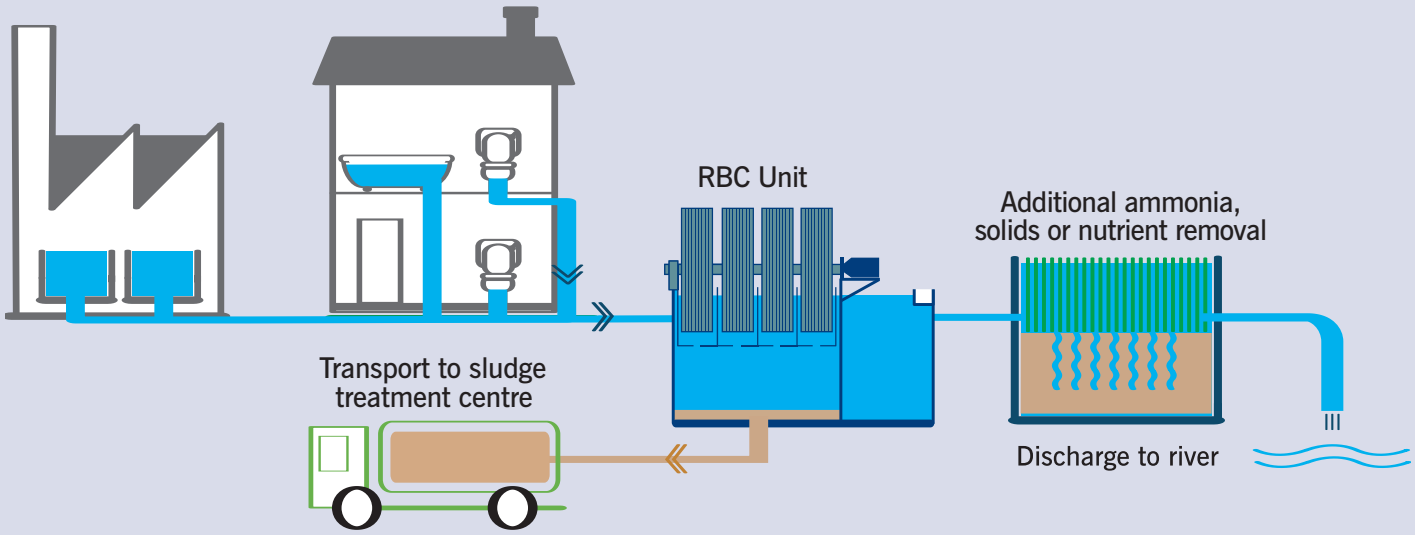
Submerged Aeration Filter (SAF)

Severn Trent Water operates more than a thousand sewage works. Where these serve relatively small populations (usually less than 2000 people) simple, standardised and reliable package plants have been developed to provide high quality treatment. Most of the equipment for the treatment plants can be manufactured off-site and installed following minimum on-site preparation, thus reducing costs and simplifying maintenance requirements. They are based on the fundamentals of biological sewage treatment and may include the necessary primary treatment within one unit.

Many different types of package plant have been evaluated. We have standardised on only a small number which we have found to be reliable, simple to install and economic to run. In addition, the units have low visual impact which can be important to our customers in rural areas where first time sewerage is being introduced.

The main two types utilised in Severn Trent Water are Rotating Biological Contactors (RBCs) and Submerged Aerated Filters (SAFs). They both are developments of 'fixed film' biological treatment and rely, like biological filters, on providing a surface for bacteria, fungi and protozoa to grow, sufficient air and a means of removing surplus micro-organisms.

The treatment biozone is fully enclosed in both types. Sludge produced by the treatment processes is collected in on-site storage facilities and these are periodically emptied by tanker to larger sewage works with sludge treatment facilities.

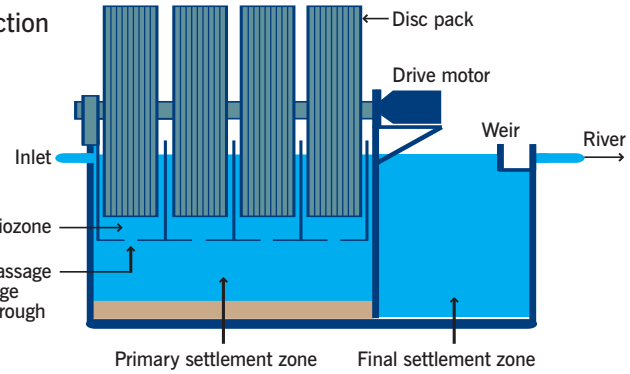


Rotating Biological Contactors (RBCs)

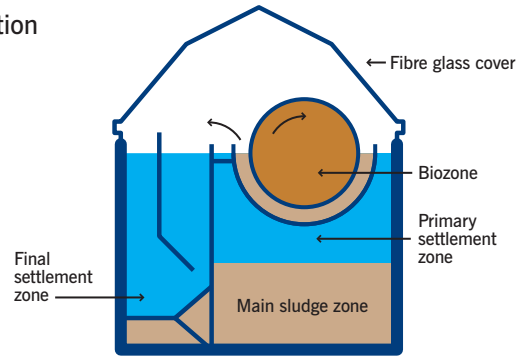
Sewage enters via a pipe into the primary settlement zone. Heavier solids settle to the bottom and form a sludge which is periodically removed by tanker. Settled sewage passes forward into the next stage. This consists of a trough on top of the primary settlement zone in which a series of circular discs are suspended partly submerged in the liquid. The discs slowly revolve at about one revolution per minute. A biological film, similar to that produced in conventional filter beds, develops on the discs. The film on the revolving disc alternately receives 'food' from settled sewage in the trough and air when not immersed. This ensures the micro-organisms grow and remove impurities from the sewage.

Dislodged fragments of biofilm and grazing micro-organisms are kept in suspension and are then settled out of the liquid in a final settlement zone before the effluent discharges from the tank. This may be given tertiary treatment, using reed beds, before discharge to the receiving watercourse when very high effluent standards are required.

Side section of RBC



End section of RBC



Submerged Aerated Filters (SAFs)

SAFs can provide full treatment for small communities or provide additional ammonia removal capacity for some slightly larger sewage works where the Environment Agency has introduced a more stringent 'Consent to Discharge'. After primary treatment, settled sewage passes forward into the continuously aerated biozone. Within the biozone are packs of corrugated plastic media. Treatment is carried out by bacteria on these fixed media surfaces. The ability of the media to release bacterial growth and avoid clogging up the flow is very important.

There is usually a means of providing air scouring of the media to assist film release. For SAFs providing full treatment it is essential to provide separation of biofilm particles and clarified effluent in final settlement tanks before discharge to the river.

Inside a SAF