




# Wastewater Treatment





At TES, we aim to exceed client expectations. Through in-depth consultation, expert design and quality workmanship, our reputation in delivering premium services to the wastewater industry is second to none.





TES have a proven track record in technical excellence and expert project management. We view our role as partner rather than simply supplier. At TES we offer a range of wastewater treatment services such as mechanical and electrical engineering, minor civil works and process solutions. We provide a complete turnkey package.



TES have an impressive portfolio of wastewater treatment projects ranging from complete refurbishments to bespoke packages covering municipal, industrial and domestic sectors.

We feel that each project deserves an allocated team of specialists responsible for design, procurement and complete project management. As part of the TES quality management system, our expert design team use state-of-the-art technology and advanced processes to develop quality approved wastewater treatment packages.

What makes TES stand out, is our unwavering commitment to Lifecycle Engineering - our ability to oversee every stage of the contract with immense expertise. From concept to completion, TES have the capacity to expertly manage every detail of the project. Our all-encompassing services include design, procurement, build, installation, commissioning and testing. TES are infinitely committed to every stage of the project lifecycle.

Irrespective of scale or complexity, our experienced team of engineers can identify the most effective wastewater treatment solutions to include:

- Preliminary effluent treatment (screening, grit & fog removal)
- Primary / secondary / tertiary treatment
- Aerobic / anaerobic digestion
- Suspended growth (activated sludge) processes
- Fixed film processes
- Sludge treatment (conditioning / dewatering & disposal )
- EFW (energy from waste) technologies (bio gas production & storage)
- Treated effluent recovery & reuse
- Industrial effluent pilot studies & modelling
- Odour control

Our expertise in terms of wastewater treatment enables TES to offer an extensive portfolio of proven technologies. A brief overview of our process solutions include:



### *ASP (Activated Sludge Processes)*

ASP's encompass a variety of mechanisms and processes that use dissolved oxygen to promote the growth of biological floc which substantially removes organic material. The process essentially traps or retains particulate material utilising primary, secondary and tertiary treatment stages.

In all activated sludge plants, once the sewage (or industrial wastewater) has received sufficient treatment, excess mixed liquor is released into settling tanks and the treated supernatant is discharged to undergo further processing. Part of the settled material, the sludge, is returned to the head of the aeration system to re-seed the new sewage (or industrial wastewater) entering the tank. Excess sludge which eventually accumulates is also removed from the treatment process.

### *MBR (Membrane Bio Reactor)*

MBR combines activated sludge treatment with a membrane liquid-solid separation process. The separation interface utilises low pressure microfiltration or ultra filtration membranes, eliminating the need for clarification and tertiary filtration.

One of the key benefits of the MBR system is that it effectively overcomes the limitations associated with poor settling of sludge in conventional processes. The technology permits bioreactor operation with considerably higher mixed liquor suspended solids (MLSS) concentration than conventional systems, which are limited by sludge settling.

The elevated biomass concentration within the process allows for effective removal of both soluble and particulate biodegradable materials at higher loading rates. This achieves considerably longer Sludge Retention Times (SRT's) therefore requiring minimal footprint, whilst ensuring complete nitrification.

### *RBC (Rotating Biological Contactor)*

RBC's are mechanical secondary treatment systems, which are extremely robust and capable of withstanding surges in organic load. The rotating discs support the growth of bacteria and micro-organisms present in the wastewater, which break down and stabilise organic pollutants. Oxygen is obtained from the atmosphere as the discs rotate.

As the micro-organisms grow, they build up on the media until they are removed due to the shear force of the rotating discs in the sewage. Effluent from the RBC is then passed through final clarifiers where the micro-organisms in suspension, settle as sludge. The sludge is withdrawn from the clarifier for further treatment.

### *SBR (Sequencing Batch Reactor)*

SBR's consist of at least two identically equipped process units with a common inlet, which can be alternated. The units have a "flow through" system. While one unit is in settle/decant mode the other is aerating and filling. There are four stages to treatment; fill, aeration, settling and decanting.

The aeration stage involves adding air to the mixed solids and liquid. During this period the inlet valve to the tank is open and a return activated sludge pump takes mixed liquid and solids (mixed liquor) from the outlet end of the tank to the inlet. The incoming sewage is effectively implanted with live bacteria.

The sludge formed by the bacteria is then allowed to settle to the bottom of the tank. The aerobic bacteria continue to multiply until the dissolved oxygen is all but consumed. Conditions in the tank, especially near the bottom are now more suitable for the anaerobic bacteria to flourish. Many of these use nitrogen as a base element and extract it from the compounds in the liquid, using up the nitrogen compounds created in the aeration stage thereby enabling nitrification.

Our experience in designing and optimising complex wastewater treatment facilities is evident in every project. With a proven track record in the management of wastewater treatment projects, TES are committed to exceeding client expectations and preserving our natural environment.



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