

CASE STUDY



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SEWAGE TREATMENT PLANTS FOR SUSTAINABLE WATER USE

The technology used for the treatment of sewage is the activated sludge process. This applies to both small and large processing plants and the difference lies in the arrangement and enhancement of the various sections of the process.

The activated sludge process is a natural process and nature offers us a unique solution to treat sewage cost effectively.

We can identify four major sections in an activated sewage plant system:

1. Collection and anaerobic treatment.
2. Aeration.
3. Settling of the sludge removing all solids.
4. Chlorination and phosphate removal to bring the final effluent up to the required standard.

PRIMARY OR INTERCEPTOR TANK: A collection tank or interceptor tank is recommended, this ensures that the feed to the aeration tank is mixed and is more even in character and assists with the denitrification process and ensures large particles are retained and not introduced into the aeration tank. Used also to store extra sludge generated in the process, which can then be removed on six monthly or annual intervals.

AERATION TANK: The aeration tank is flat bottomed with a special aeration ring positioned in the bottom of the tank. Air is introduced and by means of the special aeration system using blowers and diffusers, intimate contact is established between the air and the solid matter.

SLUDGE SETTLER: The third section of the plant consists of a settler tank where solids are settled and a clear overflow liquid is produced. Although more expensive to manufacture, we only use conical tanks for the settler so that no solids can collect in the bottom of the tank. If these solids were not returned to the process, they would become anaerobic and cause foaming in the settler, generating a poor effluent.

PHOSPHATE SETTLER: For South Africa the outflow from sewage treatment plants feeding directly into dams and rivers, the Department of Water Affairs requires the removal of phosphates as well as chlorination. This is achieved by dosing ferric chloride and settling the phosphates using another settler similar to the main process settler.

CHLORINE OR OZONE CONTACT TANK: The final contact tank is a chlorine or ozone contact tank with a Calcium Hypochlorite Chlorinator or ozone generator, which will finally treat the liquor to produce an effluent in accordance with the General Standard suitable for discharge into dams and rivers or for use as irrigation.

SLUDGE BEDS OR TANK: It is also common practice that the solids produced in the plant are dried on site. A clean system of drying beds has been developed for this purpose to produce a sterile useable dry mass for composting.

