

# TREAT THE SEWAGE WATER AT T

## SLUDGE TREATMENT

Each treatment stage yields a different type of sludge. The three types of sludge are called primary, biological and chemical sludge. They have to be treated before final disposal. The primary and biological sludges are thickened and digested. After digestion, they are mixed with the chemical sludge and dewatered.

### Thickening

In order to reduce the volume of the sludge, its solid content is increased by removing part of the liquid in gravity thickeners. The thickened sludge is pumped to the digester. The overflow is returned to the inlet of the plant.

### Digestion

The digesters stabilize the sludge. Stabilization means that the organic material in the sludge is decomposed under anaerobic conditions. The end products are digested sludge and digester gas. The gas consists of methane and carbon dioxide and is burnt in a furnace. The heat is used for the internal needs in the plant. Any surplus heat is sold to the Malmö district-heating network.

### Sludge dewatering

The chemical sludge and the digested sludge are mixed and pumped to the dewatering department. To make the sludge easier to dewater, it is conditioned by adding organic polymers. Dewatering is done by belt filter presses. The filtrate is pumped back to the inlet of the plant.

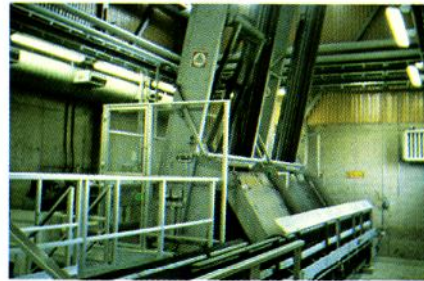
### Sludge disposal

The dewatered sludge is pumped to a container building, where the containers are filled automatically. The sludge is transported to a composting plant where powdered bark is added. The composted mixture is used for dressing existing grounds and preparing new ones. The other part of the sludge is utilized in agriculture as a fertilizer. In the future this part will increase and the aim is that all of the sludge will be utilized in this way.

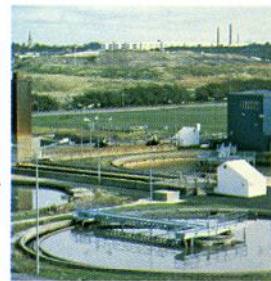
## AUTOMATION SYSTEM

The processes are monitored and controlled automatically, using computers. The system is a standardized program package for monitoring, closed-loop control, open-loop control, data recording and error messages during process disturbances. To solve non-standardized tasks, a high-level programming language (Fortran C) is integrated in to the system.

In the control office there is a viewing screen where the processes can be supervised. The operator can also intervene using a light pen. The screen displays all processes as coloured flow charts where valves, motors, pumps etc, are shown by symbols.

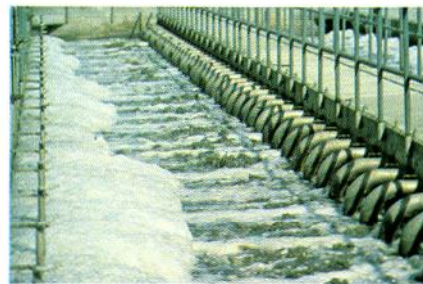
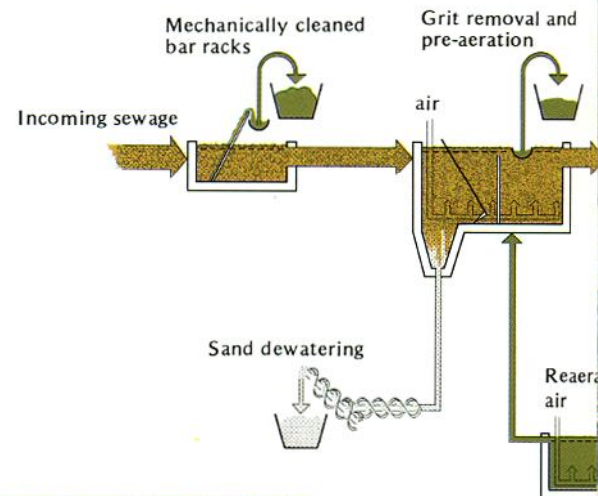


Mechanically cleaned bar racks



Primary sedimentation

## MECHANICAL TREATMENT



Aeration basins (activated sludge system)



Viewing screen



Sedimentation basins