# Sacred Heart College, Chalakudy
## Department of Chemistry
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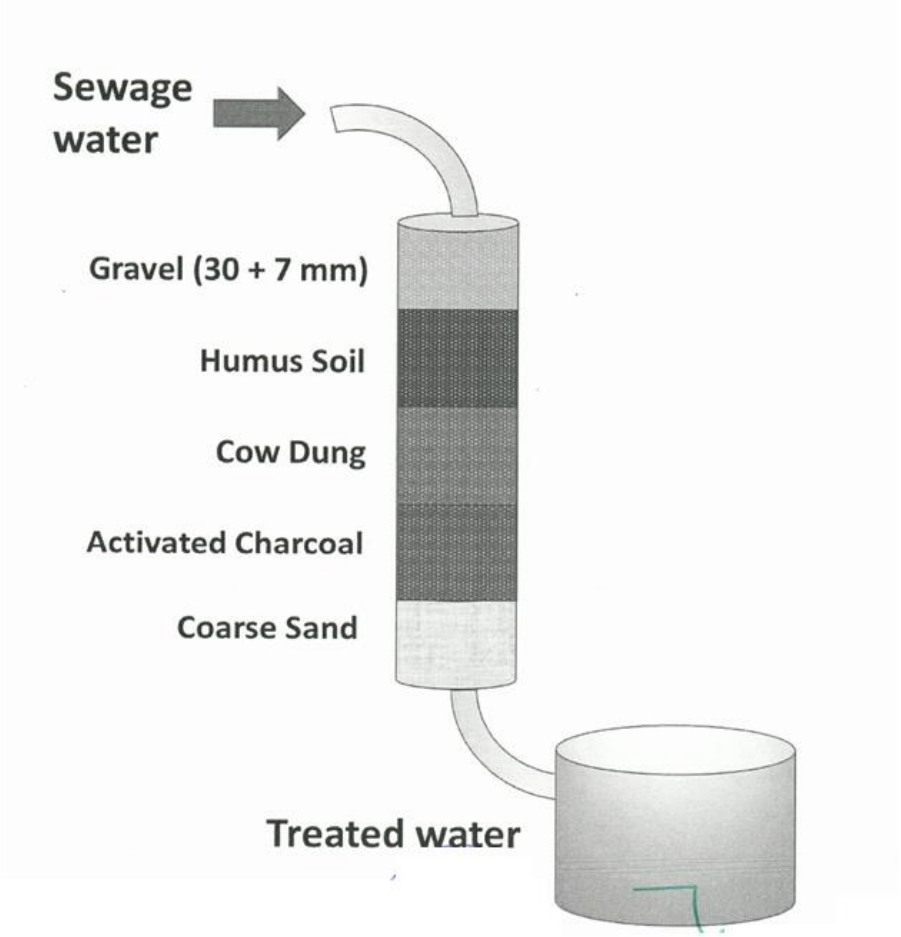
## Chemical Laboratory Waste Water Recycling System

Waste water treatment is a crucial activity before storage and use. Untreated waste water when stored will turn septic giving rise to offensive odours and providing suitable conditions for microorganisms to multiply. The usage of such untreated water would pose health risks to human beings and their environment; hence it should be treated to higher standard before reusing. The aim of treatment is to overcome health, aesthetic, and technical problems (caused by pathogens, organic matter, and solids), and to meet reuse standards. Technologies used for waste water treatment are classified into physical, chemical, and biological systems, or a combination of these. Many types of treatment systems, including: slow sand filter, activated sludge, constructed wetland, trickling filter and rotating biological contactor are employed till date.

## Waste Water Treatment Process adopted by Sacred Heart College, Chalakudy

The wastewater discharged from various laboratory activities, such as washing of glass ware and chemical waste from research and educational experimental activities are used for the treatment purposes. We have adopted a sand filtration followed by activated charcoal as the waste water treatment process. A tank-activated valve (tap) fitted to the outlet of the waste pipe of the plumbing fixtures serves as the inlet for the treatment process. A 6 feet long (8 inch diameter) PVC pipe separated into 5 different compartments is vertically fitted on the ground with an inlet and outlet valve. The compartments are filled with gravels (mixture of 30 mm and 7 mm gravels), humus soil, cow dung, activated charcoal and coarse sand (2-4 mm) respectively from top to bottom, for the filtration process.The initial filtration of waste water is simply achieved using a sand filter containing a mixture of 30 mm and 7mm gravels that removes any large particles.The waste water enters the top of the sand filter and travels down through the sand via gravity, with the sand removing any sizeable particles. Once the waste water is pre-treated, it is filtered using a very simple soil box consisting

of humus-rich top soil where soil organisms feed and reproduce using the nutrients in the soil, essentially purifying the waste water. The waste water is then passed through a bed of cow dung, a natural bio sorbent with high microbial content that can effectively purify waste water. The treated waste water is then passed through a column of activated charcoal. Activated charcoal removes toxins, unpleasant tastes and odours from the water without stripping the water of salts and important minerals. Finally, there is a layer of coarse sand at the bottom to achieve excellent filtration of the treated water. The water is initially pumped in at the top of the soil box, where it travels down via gravity through different levels. The treated water is collected in large storage containers and used for different purposes. The wastewater treatment system can treat approximately 200 Litres of waste water per day.

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