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Assignment = Waste water engineering

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Solids Retention Time (SRT)

Solid retention time also known as the mean cell residence time or MCRT is the amount of time. It is days that solids or bacteria are maintained in the activated sludge system. To calculate the SRT of an activated sludge process. it is necessary to know the amount of pounds of solids or suspended solids in activated sludge system and the amount of pounds of suspended solids leaving the activated sludge system.

To determine the pounds of suspended solids in the activated sludge system. the pounds of mixed liquor suspended solids (MLSS) must be calculated. the MLSS consist of all solids in the aeration tanks and secondary clarifiers therefore the pounds of MLSS in an activated sludge system consists of the concentration (mg/L) of MLSS times the volume (MG) of the aeration of tank(s) and clarifier(s) times the weight constant of 8.34 pounds per gallon of wastewater. pounds of MLSS = MLSS mg/L × (volume of aeration tank + clarifiers MG) × 8.34 pound/gal wastewater.

to determine the pounds of suspended solids leaving the activated sludge process. the amount or pounds of suspended solids lost through

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wasting and discharge in the secondry effluent must be calculated. Therefore the pounds of suspended solids leaving the activated sludge process consist of pounds of activated sludge wasted per day and the pounds of activated sludge or secondry effluent suspended solids discharged per day.

pounds of suspended solids leaving activated sludge process = wasted sludge (mg/ltr) x wasted sludge flow (MGD) x 8.34 pounds/gal wastwater + secondry suspended solids mg/ltr x Effluent flow (MGD) x 8.34 pounds/gal wastewater

The solid retention time of an activated sludge process can be calculated by dividing the pounds of suspended solids leaving the activated sludge system.

SRT = (suspended solids in System) /

SPS (Suspended Solids leaving System per day)

Hydrullic retention Time (HRT)

The hydrullic retention time HRT is the amount of time in hours for wastewater to pass through a tank such as an aeration tank. Changes in the HRT of an activated sludge process can be affect biological activity. For eg. decreasing HRT adversly affects nitrification.

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While increasing HRT nitrification and the solubilization of colloidal BOD and particulate BOD.
The HRT of an aeration tank is determined by dividing the volume of the aeration tank in million gallons by the flow rate through the aeration. tank must be expressed as gallons per hour (gph)

HRT (hours) = (volume of aeration tank gal) × (flow rate gph)

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