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Assignment # 01

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* Two basic design parameters of wastewater treatment systems are Hydraulic Retention time (HRT) and Solids Retention time (SRT).

1). Explanation of these parameters.

(i). Hydraulic Retention Time (HRT):

The hydraulic retention time (HRT) in waste water treatment is a measure at an average length of time holding the wastewater in a tank - It is also known as hydraulic residence time -

The wastewater treatment plant is mainly designed to handle the waste water at normal load & also during shock loads -

The wastewater is retained in different treatment units at a particular time to achieve the desired parameters -

(ii). Solids Retention time:

The solids retention time or SRT controls the concentrations of bacteria throughout the treatment system - A higher SRT contributes to a higher bacterial concentration in the reactor, which gives rise to:

- Smaller reactor size
- Larger separator size
- Reduced sludge production
- Higher aeration requirements due to the extra oxygen required for endogenous respiration.

2) Methods used for decoupling of SRT and HRT?

The effect of uncoupling between solids retention time (SRT) and hydraulic retention time (HRT) and the SRT/HRT ratio on algal growth and nutrient (N and P) removal in an algal membrane bioreactor (A-MBR) with a tanks-in-series configuration. Under 12-hour light and 12-hour dark conditions with a light intensity of $150 \mu\text{mol}/\text{m}^2/\text{sec}$

at the algal mixed liquor surface, the A-MBR system was operated at a fixed SRT (5 days) by varying HRT from 12 to 6 hours, and later at a fixed HRT (12 hours) by reducing SRT from 10 days to 5 days.

3). Advantages of decoupling SRT and HRT:

Decoupling function and taxonomy in the global ocean microbiome is the process that shape microbial communities over space and time important for predicting - To further explore the relative importance of individual environmental variables, we performed correlation.

Reducing HRT may inhibit the propionate generation by reducing microbial diversity and may result in an increase in the biohydrogen.

Maintaining longer SRT and shorter HRT might improve the bioH₂ generation efficiency.