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Section = "A"

Assignment = 01..

A:-

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Brief Description Hydraulic Retention Time (HRT)

The hydraulic Retention Time (HRT) are also known as hydraulic residence time. The hydraulic retention Time (HRT) is waste-water treatment plant is a measure of an average length of time holding the wastewater in a tank. It is the relation between volume & flow rate.

$$HRT = V / \text{flow rate}$$

HRT is the important parameter in wastewater treatment, which directly affect the design, operational / investment cost and energy requirements and in general, higher HRT will lead greater investment costs. Therefore, varying HRT also has a significant effect on the power generation and wastewater treatment characteristic of the MFC and MEC.

Solids Retention Time (SRT):-

The Solids retention Time (SRT) is the time the solid fraction of the wastewater spend in a treatment unit. The SRT is an important design & operating parameter for the activated and sludge process.

(2)

It is the quantity of solid maintained in the reactor divided by the quantity of solid coming out the reactor each day;

$$SRT = \frac{V \cdot C_d}{Q_{out} \times C_{out}}$$

Here;

- V = Digester Volume.
- C_d = Solid Concentration.
- Q_{out} = Volume wasted each day.
- C_{out} = Solid Concentration of the effluent.

The Solid retention time controls the concentration 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
- Reduce sludge production.
- Higher oxygen requirement due to the extra oxygen required for endogenous respiration.

(3)

(B) . Methods used for decoupling SRT from HRT;

The method which are used for decoupling SRT from HRT are;

- Reaeration Thickening
- Anaerobic Municipal Wastewater Treatment.
- Integrated waste Management
- Distiller Grains.

C :- Advantage of decoupling SRT from HRT:

There are following method which are given below -

- To produce the solid free better quality effluents while the use of anaerobic biomass.
- The main advantage of decoupling SRT from HRT is that it will be separated and be easily classified.
- To investigate the effect of Hydraulic Retention Time.
- By decoupling SRT from HRT the liquid wastewater can be presented faster.
- Energy can be recovered, thus providing ecological and economical benefits.