Assignment # 1 (Revised)

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CLASS :- BE (C)

SECTION :- A

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Subject :- waste water engineering

Q) Briefly discribe design parameters of waste water treatment system? 2245

1) Briefly describe each one of these parameter?

4) Solid Retention Time (SRT):-

The solid retention time (SRT) is the average time the activated sludge solids are in the system. The SRT is an important design and operating parameter for the activated sludge process and is usually expressed in days. The SRT control the concentration of bacteria throughout contributes to a higher bacterial concentration in the reactor which given rise to

1) Smaller reactor size
2) Larger separator size
3) Reduce sludge production
4) Higher aeration requirement due to the extra oxygen required for undergenous respination.

1) Hydraulic Retention Time (HRT):- 7745 (2)

The hydraulic retention time (HRT) is a measure of average length of time that a soluble compound remain in a constructed bioreactor.

HRT is define as the ration between the reactor volume and the feed flow rate represents the average time the cells and substrates stay inside the reactor. HRT is very important parameter for the hydrogen and methane production in continuous mode. The volume of aeration tank divided by the influent flow rate is the hydraulic retention time. very low HRT comports the washout of the reactor. which means all the active micro organism escape out from the reactor. The parameter is linked to the specific and different growth rates of hydrogen and methane - producing bacteria. low HRT favored the washout of methanogens guarantying the survival of hydrogen produces.

(2) Methods used for decoupling SRT from HRT:-

The methods which are used for decoupling SRT from HRT are as given below:-

1) Recuperative thickening:
2) Distiller grains
3) Anaerobic reactor design.
4) integrated waste management

1) RECUPERATIVE THICKENING:-

It increases the solid retention time (SRT) independently of the hydraulic retention time (HRT) by thickening a proportion of digestate to remove water and then returning the thickned sludge back to digester.

2) Distiller grains:-

The distiller grains wastewater treatment and recycling biomass energy using upflow solid reactor was carried out. USR reactor was operated under thermophilic fermentation condition at 52°C.

3) Anaerobic reactor designs:-

Anaerobic reactor designs which decouple SRT from HRT. The design concept were improved from classic reactors like septic tanks and anaerobic ponds. Its modern high rate reactor configuration like

Anaerobic filters. It is used with separating and recirculating a portion of the microbes/solids, or immobilizing the biomass to such approaches allow a high SRT to be maintained.

4) INTEGRATED WASTE MANAGEMENT:-

The function Elements of integrated wastewater management system are generation and composition, collection, treatment including sludge treatment and disposal and reuse.

(3) ADVANTAGES OF DECOUPLING SRT FROM HRT:-

1) HRT treatment technology has relatively low equipment cost.

2) Available HRT treatment system can be applied for both small and larger scale.

3) The stability process can be easily achieved.

4) Management requirement is low.

5) HRT matiodegradable organics can be degraded.

6) Less space is required for an HRT treatment plant

7) off gas air pollution can be eliminated.

8) It does not require the import of expensive equipments.