Journal of Science and Technology
ISSN: 2456-5660 Volume 5, Issue 4, July-August 2020

www.jst.org.in *DOI: https://doi.org/10.46243/jst.2020.v5.i4.pp129-136*

Waste Water Treatment by Using Moving Bed Bio Film Reactors

Gomasa Ramesh[1], Gopu Anil[2], Kandika Lalitha[3], Katam Sambasiva Rao[4]
Jannu Prashanth[5]

[1,2,3,4](Department of Structural Engineering, Vaagdevi College of Engineering, India.)
[5](Department of Environmental Engineering, JNTUH, India.)
Corresponding Author: rameshgomasa1@gmail.com

To Cite this Article
Gomasa Ramesh, Gopu Anil, Kandika Lalitha, Katam Sambasiva Rao and Jannu Prashanth, "Waste Water Treatment by Using Moving Bed Bio Film Reactors", Journal of Science and Technology, Vol. 05, Issue 04, July-August 2020, pp129-136

Article Info
Received: 02-04-2020 *Revised: 30-06-2020* *Accepted: 02-07-2020* *Published: 05-07-2020*

Abstract: *Waste water treatment is essential to re use of used water. In this paper we discuss about the waste water treatment , process and various techniques used for the treatment process. Waste water treatment is also important factor for safety of the environment conditions. To make the environment free from hazardous conditions and to make the sustainable environment. It is also controls different types of pollutions in the water. It is eco friendly in nature. Waste water engineering is the branch of Environmental engineering. which deals with occurance, distribution and treatment of waste water and recycle use of waste water. It also used for study of design construction of structures related to supply of potable water towards public. To prevent water borne diseases from the water. It is also used for disposal of waste water by selecting suitable locations . the study of waste water is also important to understand the various types of pollutions in the soil. This knowledge helps to better usage of water and disposal of the water.*

Keywords: *Waste water, Moving bed biofilm reactors, sewage treatment.*

I. Introduction

Waste water treatment consists of different types of physical processes and chemical processes as well. It is subjected to sequential operations. So, entirely waste water treatment is a chain process. It is also important to achieve good quality environment with limited or no pollution. MBBR is one of the process of waste water treatment. It is one of the important technology used in worldwide. It is used to separate the various type of substances in the water.

Fig.1. Reactor

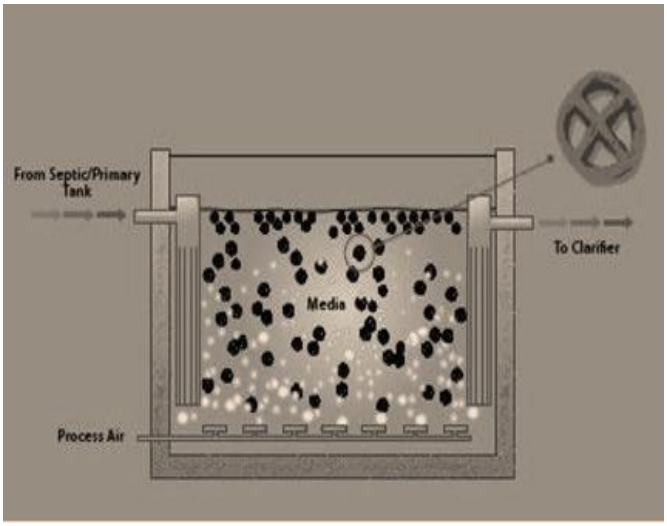

Fig.2. MBBR system

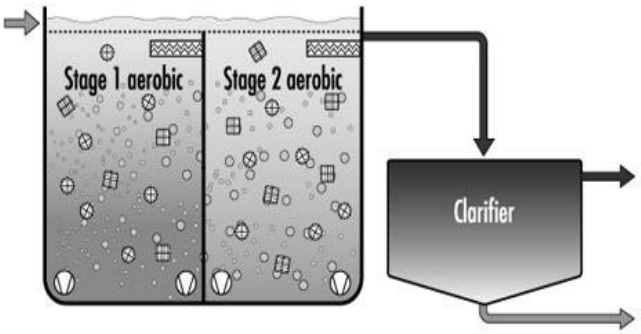

Fig.3. separation of substances

1.1 Scope and Objectives of waste water treatment:

1. To prevent water borne diseases from the water
2. To supply clean water
3. To re use of water
4. To supply water at nominal costs. Which means availability of water at low costs,
5. To remove wastages from the water
6. To make clean environment
7. To kill the harmful agents in the water
8. To remove the bacteria from the water
9. It is used to prediction of water for future populations by using empirical formulas
10. To make sustainable use of water
11. economical water supply.

II. Literature review

In this , There are two types of removal of wastes from water. They are as follows;

1. **Unit operation:** It involves physical separation of waste water such as solids, organic matter etc.

2. **Unit process:** It involves chemical separation of waste water such as suspende particles, colloids etc.

In this literature, the whole treatment is classified into several methods. They are as follows;

A. Preliminary treatment: It is the first step in the unit operation. It is used to remove the floating matter, sand and grit, oil and grease separation.

B. Primary treatment: It is second step in the unit operation. It is used to remove the sediments and coagulants from the waste water.

C. Secondary treatment: It is the first unit process in the waste water system. It involves physical and chemical analysis of waste water. It consists of aerobic process and an-aerobic process.

D. Tertiary treatment: It is the final step in the waste water treatment process. It involves only chemical analysis of waste water to remove and kill the bacteria and other micro organisms present in the water.

III. Methodology

A. **Preliminary treatment:** It consists of following order.

1. Screening
2. Grit chamber
3. Detritus tank
4. Skimming tank

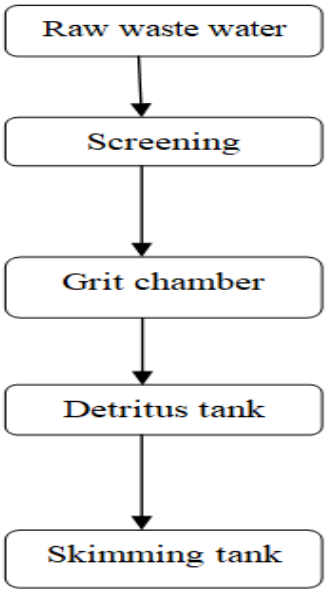

Fig.4. Preliminary treatment process

3.1 Screening:

Screening is the first step of the unit operation. It involves to removal of the floating matter and floating objects from the water. There are three types of screeners are available . they are as follows;

a. Fine screeners: range between 1.5 to 5mm
b. Medium screeners: range between 5 to 50mm
c. Large screeners: range between 50 to 80 mm.

Fig.5. Screening

3.2 Grit chamber:

After screening, It is used to remove grit and sand particles from the waste water. Diameter of particles range from 0.2mm to 1mm.

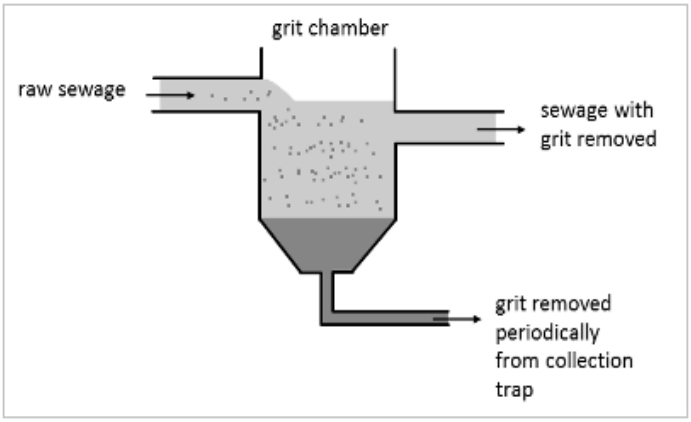

Fig.6. Grit chamber

3.3 Detritus tank:

It is also used for removing sand and grit particles. The difference is detention time is more for detritus tank compared to grit chamber.

3.4 Skimming tank:

It is used to remove oil and grease from the waste water. Detention time is more compared to detritus tank.

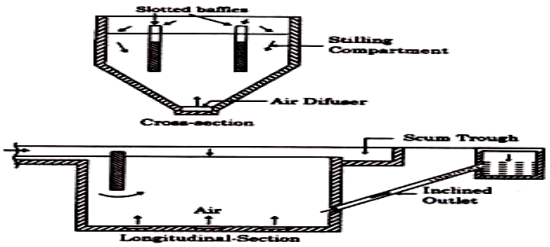

Fig.7. Skimming tank

B. **Primary treatment:** It consists of following order.

1. Sedimentation
2. Coagulation

1.Sedimentation:

Sedimentation is the physical unit process. It is used to remove suspended solids. Generally particles are

settles down due to their weight and density. It is known as sedimentation.

It is also known as type-I settling tank. There are two types of sedimentation tanks;

1. Continuous flow type
2. Hopper at bottom type

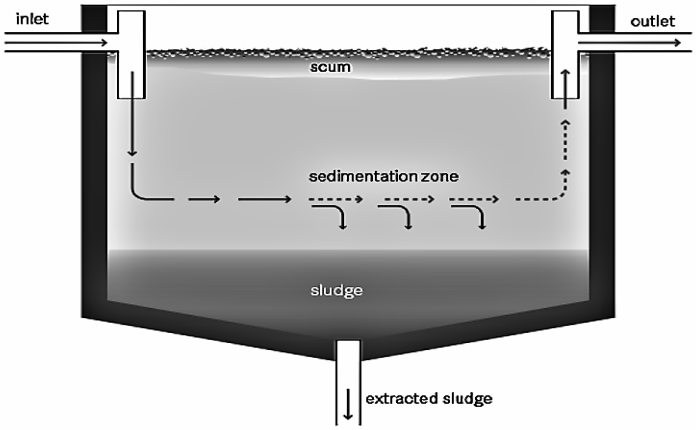

Fig.8. Sedimentation tank

2.Coagulation:

It is chemical unit process of waste water treatment. It is used to remove finely suspended particles and colloids from the waste water. It is also known as type-II settling tank.

Fig.9. treatment of waste water

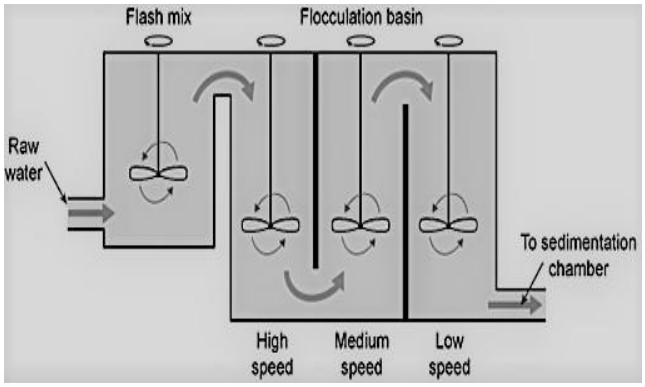

Fig.10. Flocculation

C. **Secondary treatment:**

Secondary treatment is also known as Biological treatment. In this two types of processes are there. They are as follows;

1. Aerobic process
2. Anaerobic process

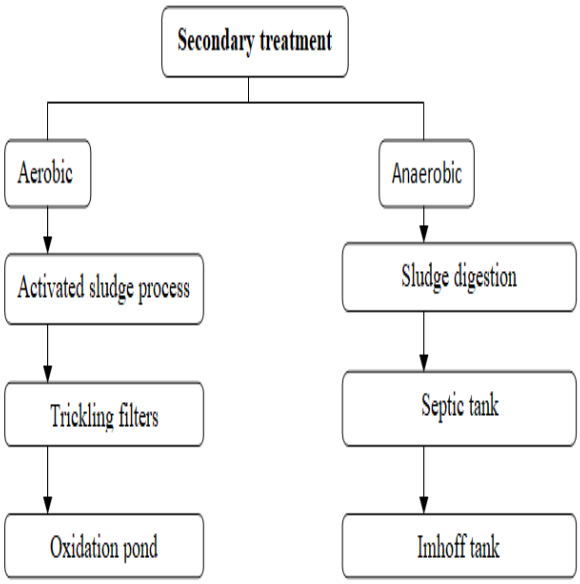

Fig.11. classification of secondary treatment

1.Aerobic treatment:

- It is performed in presence of the air or Oxygen .
- End products are sulphates and nitrates
- Present of bacteria is known as Aerobic bacteria

2.Anaerobic treatment:

- It is performed in absence of the air or Oxygen.
- End products are corbon-dioxide and methane
- Present of bacteria is known as Anaerobic bacteria.

A bacteria is present in aerobic and non aerobic as well. It is known as Facultative bacteria.

D. **Tertiary treatment:**

It is the last step in the treatment of waste water. It involves remaining of all other treatments. It is also known as water softening treatments. Following are the various types of water softening treatments;

1. Boiling method
2. Lime soda method
3. Adding lime method
4. Zeolite method

Above all are used to softening the water

5. Aeration method
6. Activated corbon method

7. Copper sulphate method

Above all are used to remove colour, odour, taste from the water content.

8. Iron and manganese method
9. Desalinization :
   it is the process of removal of salinity of the water.
10. Defluorization :
    it is the process of removal of fluorides in water content. Nalgonda technique also used for defluorization process.

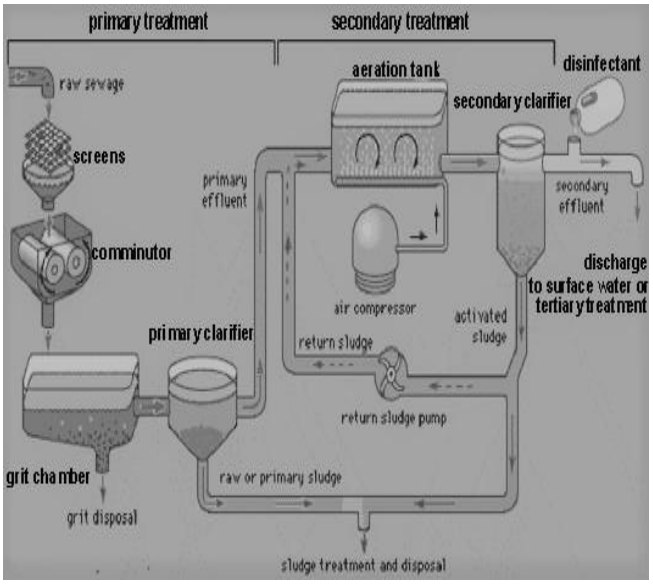

Fig.12. Process of treatment

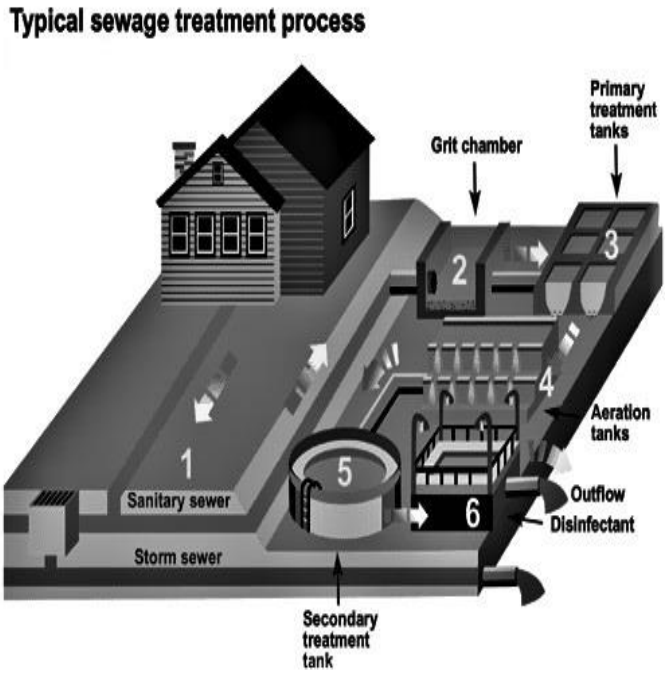

Fig.13. Sewage treatment process

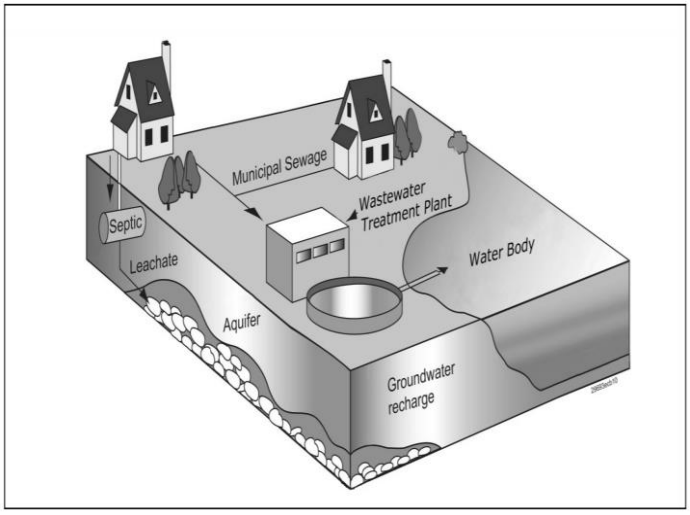

Fig.14. sample collection of waste water

IV. **Conclusion**

The main aim of this paper is to understanding about thewaste water treatment and its process. It gives the minimum knowledge to the readers about treatment of water. It is also helps to understand about disposal of waste water and its permissible limits. It is also helps to understand about water borne diseases and prevention of it. It also plays an important role to make sustainable environment, clean and healthy life to the surrounding peoples. It is also useful to understand about source, conveyance and distribution of waste water. It gives all the basic information to indepth knowledge to the readers about all the treatment process.

References

[1] Code book on water supply and sanitation IS 1172:1993
[2] Hand book of water and waste water treatment technologies by Nicholas p.
[3] Water supply engineering- environmental engineering by Punmia
[4] Hand book of environmental engineering by Lee.