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Research Article

TREATMENT FOR EFFLUENT WASTEWATER GENERATED AFTER CONTAINER WASHING USING MBBR TECHNOLOGY

Madhavi Surwade and Gawande S.M

Civil-Environmental Engg. Department, Savitribai Phule Pune University
Apcoer, Pune, India

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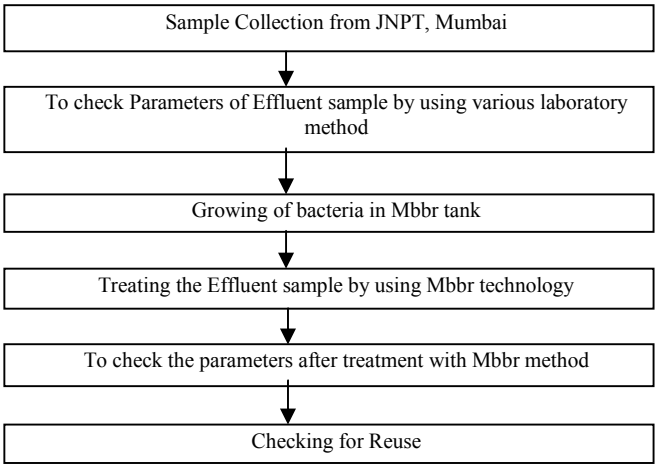
ABSTRACT

Discarding effluent generated on a ship is one of the few things a ship which should be taken care of if one wants to save his shipping company from heavy fine. Though effluent can be discharged into the sea, we cannot discharge it directly overboard as there are some regulations regarding discharging of effluent that needs to be followed. Most of the vessels have an effluent treatment system, which is designed to treat effluent water before releasing it from the vessel to the sea. The effluent generated after different containers washing in dockyard contains different type of wastes. Hence in this paper the characteristics of effluent water generated after different container washing and its parameters, different treating methods for effluent, and its efficiency of its reuse for further purposes is mentioned.

INTRODUCTION

Waste can contain harmful microbial, chemical or physical agents. Sharp objects are in themselves dangerous and may harbor infectious agents. Risks of danger involves as a result of improperly handled ship waste are increasing with the increasing number of ships in present and the increase in habitation in port areas. Waste streams on ships include sewage, grey water and garbage, as well as effluent from oil/water separators, cooling water, boiler and steam generator blow-down, medical wastes and hazardous waste. Restrictions on keeping hazardous wastes into water bodies mean that ships need to retain those wastes for periods of time. So there is need to treat this effluent water generated after number of container washings released and make it usable to such a extent that wastage will be less and this effluent water can be reused for any other purposes. There are already many different Biofilm systems in use, such as trickling filters, Rotating Biological Contactors (RBCs), fixed media submerged bio-filters, granular media bio-filters, fluidized bed reactors, etc. A moving bed biological reactor (MBBR) is a combination of two methods. The Mbbr technology has proved to be reliable and economical for treating the effluent waste water effectively.

MATERIALS AND METHODOLOGY



Step I: Sample Collection

The effluent samples used in this study was collected from Jawaharlal Nehru port trust (JNPT), and Gail India Bhawan, Mumbai.

Corresponding author:* **Madhavi Surwade
Civil-Environmental Engg. Department, Savitribai Phule Pune University Apcoer, Pune, India

Fig 1 Sample Collection from Gail India Bhawan

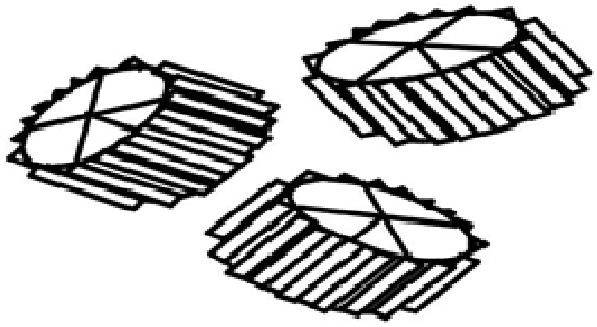
Step II: To check physicochemical Parameters of effluent sample by using various methods

To examine the performance of effluent samples on the basis of different parameter and method will be used like: pH, Alkalinity, Hardness, Temperature, Dissolved Oxygen, BOD, and COD.

Step III: Growing of Mbbr bacteria:

For growing of Mbbr bacteria, firstly I visit various treatment plants for studying the basic idea about bacteria, its growth period, suitable methods of growing etc.

Media



Mbbr media is putted into the mbbr tank where the effluent sample has been already kept. After adding the media with the help of aeration method oxygen is supplied to the whole tank so that the bacteria can grow into the tank with the help of oxygen and get stick to the media. Media is nothing but a medium for the bacteria to grow on.

Adding Urea

The effluent sample is kept under supervision for 2-3 days for knowing the bacteria growth. After that 5gm of urea is added for better growth of bacteria.

Addition of Jaggery

For easily and better growth of bacteria I also added jaggery of 10gm in mbbr tank. After adding jaggery the growth of bacteria doubles in quantity and the process of treating also increases.

Addition of frooti

For better growth of bacteria I also added frooti pouch of 20ml in Mbbr tank. After adding front the growth of bacteria doubles in quantity.

Step IV: Treated the effluent sample using Mbbr method

The effluent sample is been kept in Mbbr tank for a retention period of 24 hrs . the process is a continous process. Each reading is examine and noted down at every 6 hrs . so daily I got 4 readings. Next day I used to clear the whole tank and washed it thorougly . a day after tommorow again a new effluent sample is collected and is putted into mbbr tank for next readings.

RESULTS

1. It is found out that bacteria has grown properly and treated the effluent sample correctly.
2. I minimize bod, cod, oil and grease, ph, Tss from wastewater and make it reusable for other than drinking purpose Shown in following table:

Table 1 before and after treatment value of effluent sample

Sr.No.	Test	Before Treatment	After Treatment
1	pH	8.85	7.07
2	TSS	104.0mg/lit	58.0
3	COD	388.52	248.95
4	BOD	88.0	77.6
5	OIL AND GREASE	42.3	28.0

CONCLUSION

With the growth in population of the world and increased waste generation, it has become the need of the hour to set up quick and efficient methods for treating all kind of waste and minimize them, concentrating on Reuse and is a user friendly tool for general peoples. It can help to make intelligent decisions; check the feasibility of different alternatives available and select one out of it which comes out to be the most optimal. The present study provides valuable information for further development of cost efficient treatment systems. The process is expected to require less operator intervention compared to the conventional treatment process. The moving bed biofilm reactor is a well-proven, economical and compact reactor for wastewater treatment.

Acknowledgments

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