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Smart Waste Water Treatment

Nirav Devalia[1], Kunal Dharod[2], Kruti Shah[3], Prof. Bhusan Save[4]
[1]Department of Electrical Engineering, Viva Institute of Technology, Virar, India
Email: devalianirav@gmail.com
[2]Department of Electrical Engineering, Viva Institute of Technology, Virar, India
Email: kdharod171@gmail.com
[3]Department of Electrical Engineering, Viva Institute of Technology, Virar, India
Email: shahkruti83@gmail.com

Abstract— *Waste water treatment is the process of removing contaminants from wastewater, primarily from household sewage .Untreated water is causing abundant water borne diseases and polluting our water bodies. After a proper analysis of this wastewater, it is found that these are some important parameters such as Biological Oxygen Demand, pH, Chemical Oxygen Demand, Total suspended solid and Total Dissolved Solids. This paper gives an overview and a brief description about the designing and automation of decentralized wastewater treatment plant.*

Keywords— household treatment, untreated, decentralized.

I. INTRODUCTION

As we know that water is the sustainment for all life. Without water, we will all perish. Because of the critical shortage of this often overlooked natural resource, the world will soon face a long and enduring crisis Not only is it needed for humans to drink, but it is also needed to grow and sustain crops and also for animals. Treatment and reuse of the wastewater efficiently is the need of the hour.

The objective of sewage treatment is to produce a disposable emission without causing harm to the surrounding environment and in turn, it prevents pollution. Sewage treatment method is the process of removing contaminants from wastewater and household sewage. It consist of physical, chemical, and biological processes to remove physical, chemical and biological contaminants. Its aim is to produce an environmentally safe fluid waste stream and a solid waste suitable for disposal or reuse. Sewage treatment method generally consist of three stages, namely primary, secondary and tertiary treatment.

II. WORKING PRINCIPLE

2.1 Primary treatment

Primary treatment consists of elimination of large suspended organic solids. This is usually managed by sedimentation in settling basins. The liquid effluent from primary treatment, often include a large amount of suspended organic material, and has a high BOD. Sometimes, the preliminary as well as primary treatment method are grouped together, under primary treatment. The organic solids, which are split out in the sedimentation tanks, are often stabilized by anaerobic decomposition in a digestion tank.

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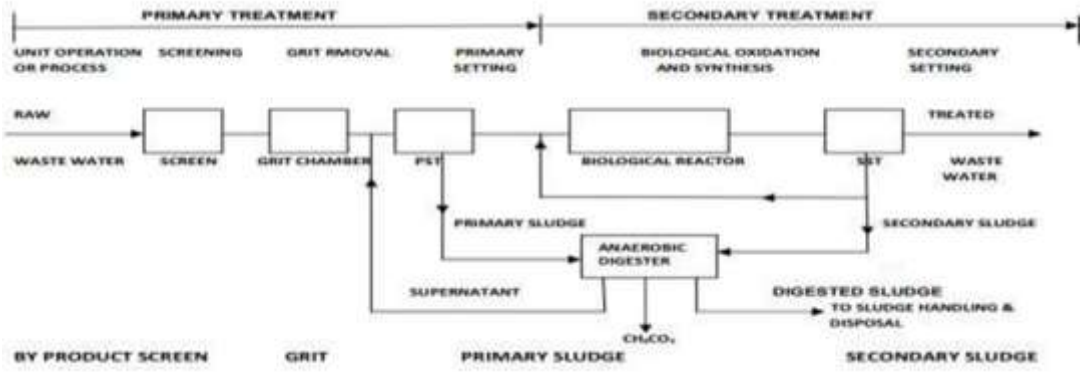

FIGURE 1: Block Diagram of waste water treatment

1.2 Secondary treatment

Secondary treatment method involves further handling of the contaminants, coming from the primary sedimentation tank. This is generally achieved through biological decomposition of organic matter, which can be carried out either under aerobic or anaerobic conditions. In these biological units, bacteria will decay the fine organic matter, to produce clearer effluent. The treatment reactors, in which aerobic bacteria decompose the organic matter are known as aerobic biological units; and may consist of Filters. Aeration tanks, with the feed of recycled activated grease. Since all these aerobic units, generally make use of primary settled sewage, they are easily mentioned as secondary units.

1.3 Final treatment

This treatment is sometimes called tertiary treatment method as this method consists of removing the organic load left after the secondary treatment, and particularly to kill the pathogenic bacteria. This treatment, which is normally transmit out by chlorination, is generally not transmitted out for disposal of sewage in water, but is carried out, while using the river stream for collecting water for reuse. It may, however, sometimes be adopted that when the outfall of sewage is very nearby to the water intake of some nearby town. This process is called Algal-bacterial wastewater treatment method.

III. LITERATURE REVIEW

Waste water, is any water that has been adversely affected in quality by anthropogenic influence. The sewage from colonies as well effluent from industrial units has been identified as main cause for water pollution across our country. Sewage is a water-carried waste, in solution or suspension that is intended to be removed from a community. Also known as wastewater, it is more than 99% water & is characterized by volume or rate of flow, physical condition, chemical constituents and the bacteriological organisms that it contains. During recent years, there has been an increasing awareness and concern about water conservation all over the world. Hence, new approaches towards achieving sustainable development of water resources have been developed internationally. Under this research paper, a cut to suit treatment technology has been developed to treat sewage. Treatment technologies adopted are activated sludge process, chlorination & filtration. The results were very encouraging. The treatment system achieved 96.8% BOD, 92.5% COD and 95% TSS & 99% Total coliform removal respectively. The treated sewage can be reused for various purpose like cooling water make up, gardening , landscape development , toilet, flushing, road washing etc. thus leading towards water conservation.

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IV. ADVANTAGES

- Reusing water for various household purposes.
- Reducing effluents that are discarded into waterbodies.
- Contributing in reduction of global warming.
- Waste water treatment at decentralized level can lead large saving of land and initial capital cost for setting up a centralized plant.

V. CONCLUSION

- Limitations due to human error or processing can be eliminated with automation.
- Environmental sustainability that is quality and quantity of surface water can be improved.
- Pollution reduction can lead to greater cause.
- By water treatment the problem of water scarcity in many parts of world can be eliminated.

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