

ASSESSMENT AND IMPROVEMENT TECHNIQUES OF QUALITY OF WASTE WATER FOR MALEGAON CITY

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ABSTRACT

A sewage treatment plant is quite necessary to receive the domestic and commercial waste and removes the materials which pose harm for general public. Its objective is to produce an environmentally-safe fluid waste stream (or treated effluent) and a solid waste (or treated sludge) suitable for disposal or reuse (usually as farm fertilizer). The growing environmental pollution needs for decontaminating waste water result in the study of characterization of waste water, especially domestic sewage. In the past, domestic waste water treatment was mainly confined to organic carbon removal. Recently, increasing pollution in the waste water leads to developing and implementing new treatment techniques to control nitrogen and other priority pollutants. Sewage Treatment Plant is a facility designed to receive the waste from domestic, commercial and industrial sources and to remove materials that damage water quality and compromise public health and safety when discharged into water receiving systems. It includes physical, chemical, and biological processes to remove various contaminants depending on its constituents. Using advanced technology it is now possible to re-use sewage effluent for drinking water. Sewage / waste water treatment consist of different processes which protect the environment & human through cleansing the water pollutant. In history people used difference method of treatment for purification of water which get advance by advancement in technological world.

Keywords: Biochemical Oxygen Demand, Chemical Oxygen Demand

1.INTRODUCTION

Water is the most precious gift of nature, the most crucial for sustaining life and is required in almost all the activities of man - for drinking and municipal use, for irrigation, to meet the growing food and fiber needs, for industries, power generation, navigation and recreation.

The treatment of wastewater is a relatively modern practice. It is the need of the day to treat the wastewater before its disposal in the river this is because it contains large amount of impurities and having undesired physical and chemical characteristics.

After giving treatment to wastewater the physical and chemical parameters should become within the permissible limit so that this treated wastewater can be discharged in the river.

1.1 Introduction of Wastewater

Wastewater is simply that part of the water supply to the community for cooking, bath, drinking, washing etc. or to the industry which has been used for different purposes and has been mixed with solids either suspended or dissolved.

1.2 Characteristics of Waste Water:

The characteristics of wastewater are not constant it differ from different domestic uses and the characteristics of industrial wastewater changes from industry to industry and also from process to process even for the same industry. However the characteristics of waste water can be categorized as,

- Physical characteristics
- Chemical characteristics
- Biological characteristics

1.3 Sources of Water for Malegaon City:

1.3.1 Girna Dam

This dam is built across the river Girna near Panzan village in Malegaon taluka and is the biggest dam in the Nasik district. The catchment area of the dam measures about 1,826 square miles. It irrigates an area of about 1.06 lakh acres much of which falls in Dhule and Jalgaon districts.

1.3.2 Chankapur Dam

A dam is constructed across the Girna river near Chankapur village in Kalvan taluka. Two canals, i.e., the Girna right bank and the Girna left bank, take off from this weir. At present, the dam has a storage capacity of 2,714 MCFT. The Girna left bank canal is 25km long.

Table 1: Population of Malegaon City

Sr. No.	Year	Population Souls
1	2011	5,06,499
2	2014	5,13,289
3	2018	5,32,044

- That the current year (2020) population of the Malegaon city is about **5, 90,800** as obtained from MMC (Malegaon Municipal Corporation) during the discussion with the city engineer of Malegaon city.
- The supply of water to the community is intermittent type with one day gap period.
- In this city there is limited number industries as compared to the other cities like Nasik, Mumbai and Pune, so the toxicity of wastewater are mainly due to domestic wastes.
- Now a day the supply rate of water to the community is about 90 lit/capita.

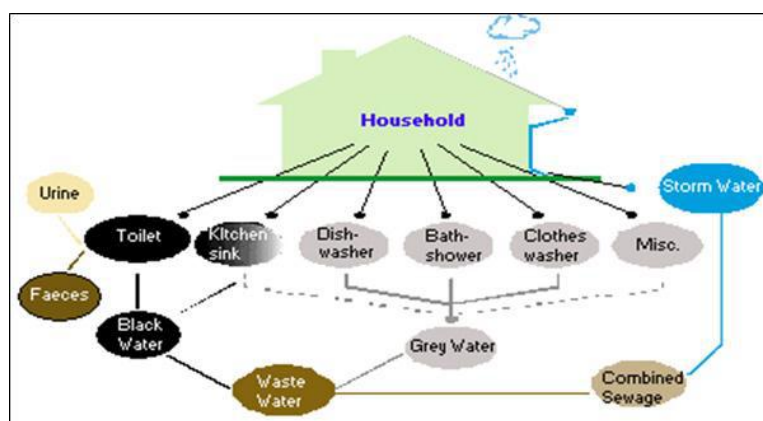


Figure 1: Domestic Waste Water



Figure 2: Industrial Waste Water

2. NECESSITY OF STP FOR MALEGAON CITY

- Malegaon city is developing city in all respects like infrastructure, education etc. The population of this city goes to increase tremendously from day to day as a result of this the demand of water were also increases and consequently wastewater generation rate also increases.
- Now a day the wastewater generated from this city is being discharged directly in the Girna river without giving any treatment causing bad effect on the aquatic life of the river and also its water quality.

- It is needed to treat this wastewater generated from the city before its disposal in the river ,the city should have sewage treatment plant (STP)

3. OBJECTIVES OF STP

- 1) To study the quantity of wastewater generated from Malegaon city.
- 2) To study type of wastewater generated from Malegaon city.
- 3) To study physical characteristics of wastewater.
- 4) To study chemical characteristics of wastewater.
- 5) To study ecological effects of wastewater which is disposed off without any treatment
- 6) To study remedies for same problem take place due to improper management of wastewater

4. METHODOLOGY:

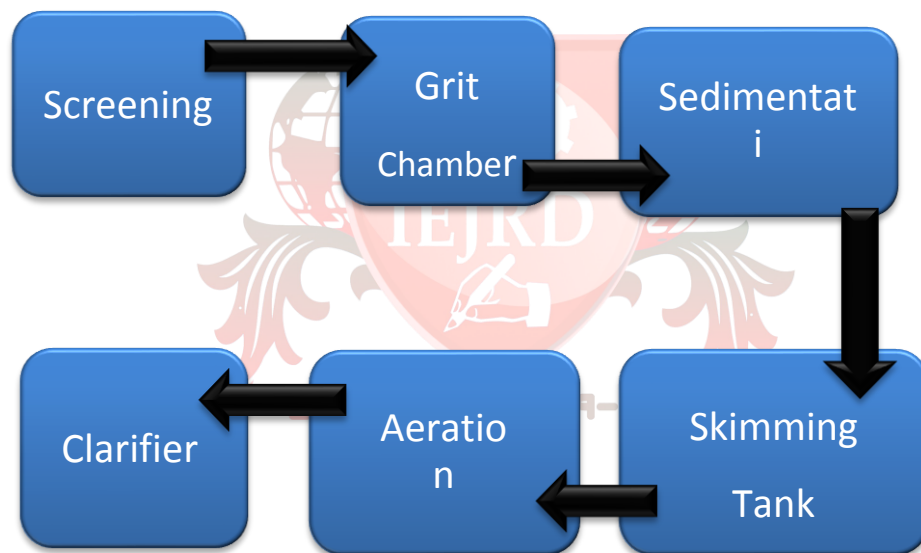


Figure 3: STP component parts

4.1 SCREENING:

By providing screen across the flow of wastewater the large floating matter such as pieces of cloths paper wood etc. present in wastewater get removed.

4.2 GRIT CHAMBER:

The grit chamber removes the grit, such as sand, gravel, and other mineral matter that has a nominal diameter of 0.15 to 0.20 mm or more.

4.3 SKIMMING TANK:

The excess amount of oil & grease in the wastewater generated from the city can be removed by employing skimming tanks in the WTP.

4.4 SEDIMENTATION TANK:

Very fine & Colloidal particles presents in the wastewater get settles down on the bed of this tank and it may remove about 30% to 35% of the BOD from the sewage.

4.5 AERATION TANK:

The wastewater from primary sedimentation tank is allowed to come in this aeration tank and mixed with 20 to 30% of own volume of activated sludge so that the suspended and colloidal matters tends to coagulate which settles down in the secondary sedimentation tank.

Note:

- The BOD of the wastewater after passing through the **Screening, Grit Chamber and Skimming Tank** process reduced by about 15 to 30%.

- The BOD of the wastewater after passing through the **Sedimentation tank and Aeration tank** processes content a little BOD (5% to 10% of original).

4.6 FLOW DIAGRAM OF STP:

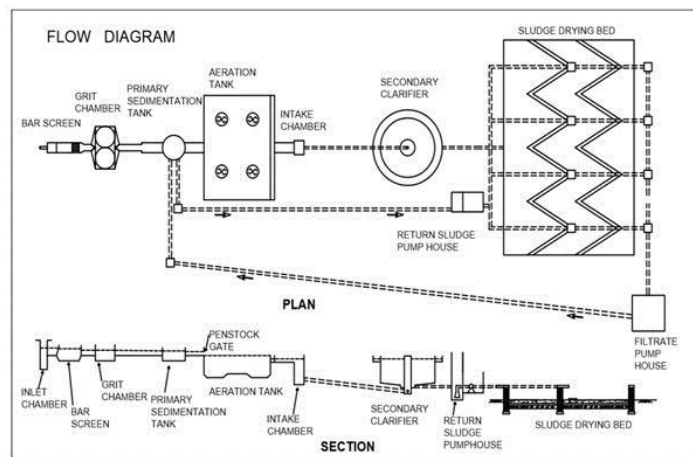


Figure 4: Flow Diagram of STP

5. EXPECTED CONCLUSION:

- If Physical, Chemical characteristics of the wastewater generated from Malegaon city is not within the permissible limit given by BIS, then there will be requirement of water to be treated with the proper procedure so that it cannot becomes to lead detrimental to aquatic life of Girna river.
- Septicness of wastewater generated from Malegaon city is checked whether it is more as compared to other city nearby region or not because wastewater generation rate from industrial sector is note more.
- The aquatic life of Girna River can strongly be damaged by the wastewater produced from Malegaon city.
- Disposal of wastewater without any treatment in water body result in various water diseases in downstream of the city.
- So that there is need to take measures by giving suitable standard primary, secondary and tertiary treatment to the wastewater so that it can be discharged in the river safely.

6. FUTURE SCOPE:

- The scope is to first characterize the distillery wastewater and membrane technology, then by these studies membrane techniques use for treatment of distillery wastewater.
- It will fulfill the rapid increasing water demand of the city
- It will also be helpful in environmental pollution control.
- It is needed to treat this wastewater generated from the city before its disposal in the river ,the city should have sewage treatment plant (STP)
- The environmental bodies, like river will also be undamaged of pollution.

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