

SEWAGE WASTEWATER TREATMENT & CONSERVATION

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Abstract - Water is a resource that is becoming increasingly scarce and needs to be sustained, globally and locally. One of the most serious problems faced by billions of people today is the availability of fresh water. Governments and organizations all over the world have realized that sustainable water and wastewater management is a necessary component of functioning communities.

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. 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.

Keywords: Sewage treatment, Sewerage, Sludge, Pollution, Ph, Domestic Waste-water, Water Conservation, Reuse.

I. INTRODUCTION

Sewage is a major carrier of disease (from human wastes) and toxins (from industrial wastes). The safe treatment of sewage is thus crucial to the health of any community. This project focuses on the complex physical and biological treatments used to render sewage both biologically and chemically harmless.

Waste water is liquid waste discharged by domestic residences, commercial properties, industry, agriculture, which often contains some contaminants that result from the mixing of wastewater from different sources. Based on its origin wastewater can be classed as sanitary, commercial, industrial, agricultural or surface runoff. Water conservation the policies, strategies and activities made to manage fresh water as a sustainable resource, to protect the water environment, and to meet current and future human demand. Population, household size, and growth and affluence all affect how much water is used.

Factors such as climate change have increased pressures on natural water resources especially in manufacturing and agricultural irrigation. Fresh, clean water is a limited resource. While most of the planet is covered in water, it is salt water that can only be consumed by humans and other species after undergoing desalination, which is an expensive process. Occurrences such as droughts further limit access to clean and fresh water, meaning people need to take steps to reduce water use and save as much water as possible.

II. MATERIALS USED

1. Pipes of fixtures
2. Tanks
3. Controls and instruments
4. Valves and fittings
5. Motors and pumps
6. Air blowers and filters
7. Chemicals

III. OBJECTIVES OF THE STUDY

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 principal objective of waste water treatment is generally to allow human and industrial effluents to be disposed of without danger to human health or unacceptable damage to the natural environment.

Practically the treatment of sewage is required in big cities only where the volume of the sewage is more as well as the quantity of various types of solid, industrial sewage etc. Is more and porous land or large quantity of water bodies is not available for the proper disposal of sewage. Thus taking into account this disadvantage, the project deals with making a system of sewage waste water treatment in the society itself and reusing the treated water for use in the buildings itself for flushing and gardening etc.

IV. METHODOLOGY OF STUDY

The sewage both domestic and industrial is required to be treated, before either, it is recycled (for industrial or it is allowed to flow into a surface stream. This treatment can be classified as,

- Preliminary method
- Primary method
- Secondary method
- Tertiary method

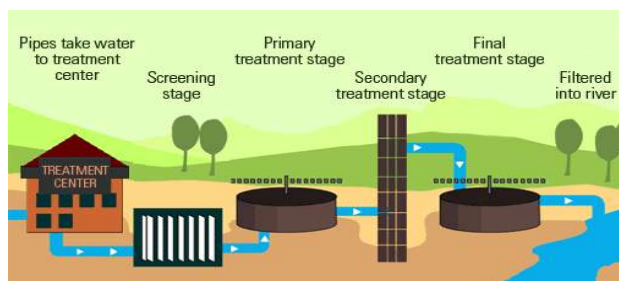


Fig No.:5.1 Process of Sewage Treatment
Source: - STP Technologies

A. THE PRELIMINARY TREATMENT

Preliminary treatment consists solely in separating the floating materials (like dead animals, tree branches, papers, pieces of rags, wood, etc.) and also the heavy settle able inorganic solids. It also helps in removing the oils and greases, etc. from the sewage. This treatment reduces the BOD of the wastewater, by about 15 to 30%. The processes used are: Screening for

removing floating papers, rags, clothes, etc. Grit chambers or detritus tanks for removing grit and sand; and Skimming tanks for removing oils and greases.

B. THE PRIMARY TREATMENT

Primary treatment consists of in removable large suspended organic solids. This is usually accomplished by sedimentation in settling basins. The liquid effluent from primary treatment, often contains a large amount of suspended organic material, and has a high BOD (about 60% of original). Sometimes, the preliminary as well as primary treatments are classified together, under primary treatment. The organic solids, which are separated out in the sedimentation tanks (in primary treatment), are often stabilized by anaerobic decomposition in a digestion tank or are incinerated. The residue is used for landfills or soil conditioners.

C. THE SECONDARY TRETMENT

Secondary treatment involves further treatment of the effluent, coming from the primary sedimentation tank. This is generally accomplished through biological decomposition of organic, which can be carried out either under aerobic or anaerobic conditions. In these biological units, bacteria will decompose the fine organic matter, to produces clearer effluent. The treatments reactors, in which the organic matter is decomposed (oxidized) by aerobic bacteria, are known as aerobic are known as aerobic biological units; and may consist of Filters (international sand filters as well as trickling filters). Aeration tanks, with the feed of recycled activated sludge (i.e. the sludge, which is settled in secondary sedimentation tank, receiving effluents from the aeration tank). Oxidation ponds and aerated lagoons. Since all these aerobic units, generally make use of primary settled sewage, they are easily classified as secondary units.

D. THE TERTIARY TREATMENT

Tertiary treatment may include a number of physical and chemical treatment processes that can be used after the Biological treatment to meet the treatment objectives. It is the next wastewater treatment process after secondary treatment. This step removes persistent contaminants that secondary treatment is not able to remove. Tertiary treatment is the final cleaning process that improves wastewater quality before it is reused, recycled or discharged through the environment.

V. IMPORTANCE OF CONSERVATION OF WATER

Fresh, clean water is a limited resource. While most of the planet is covered in water, it is salt water that can only be consumed by humans and other species after undergoing desalination, which is an expensive process. Occurrences such as droughts further limit access to clean and fresh water, meaning people need to take steps to reduce water use and save as much water as possible.

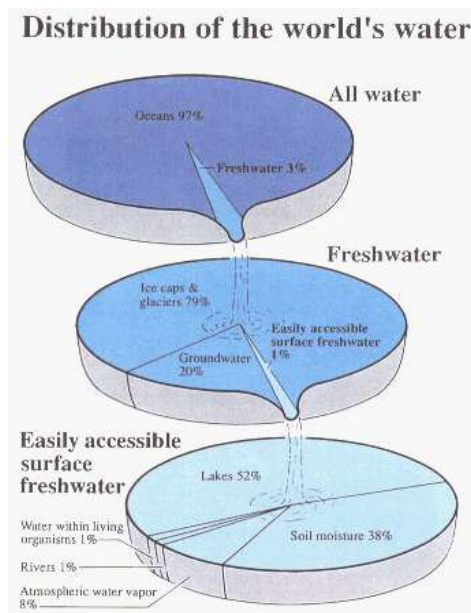


Fig No.: -4.1. Distribution of world's water
Source: Google

VI. PROCESS OF CONSERVATION OF WATER

Water conservation includes all the policies, strategies and activities made to sustainably manage the natural resource fresh water, to protect the water environment, and to meet the current and future human demand. Population, household size, and growth and affluence all affect how much water is used. Water shortage has become an increasingly difficult problem to manage. More than 40% of the world's population lives in a region where the demand for water exceeds its supply. The imbalance between supply and demand, along with persisting issues such as climate change and exponential population growth, has made water reuse a necessary method for conserving water. There are a variety of methods used in the treatment of waste water

to ensure that it is safe to use for irrigation of food crops and/or drinking water.



Fig No.: -5.7 Rain water collection
Source: - Google

This project deals with using the sewage wastewater by treating it and then using it in toilets for flushing purposes and for car washing and gardening. The process of conservation of water is to collect the rain water and store it in the collection tank and by having little treatment it can be used for the various purposes. Rain water can be collected only in rainy season and the collected water can be used in other seasons.

VII. CONCLUSION

The project entitled "Sewage Wastewater Treatment and Conservation" has been successfully completed. The project describes the use of wastewater in day to day activities for flushing, gardening and car washing.

The treatment of wastewater until now has been done for major projects for towns, cities or on a district level. This project has been performed for complex, societies i.e. for residential buildings. Also the sewage wastewater generated from these buildings is treated by simple cost effective processes discussed as above in the chapters. And the treated wastewater has been used for the building itself which in how helps in maintaining the water level use in the surrounding ecosystem. This project also takes into consideration the conservation of water by collection of rain water and further by treating it can be used for day to day activities in the building itself.

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