

Study of Sewage Treatment Plant

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Abstract - I am Happy to presenting this paper in front of you. Because The Stabilization & Construction of provided work with Satisfaction Shows the efficiency of engineering work. Preparing a brief report before any construction work, which is includes time duration and estimated Cost of the project. This report is includes all the content involving in the stabilization of the "Sewage Treatment Plant". In now times some areas has too much polluted waste water, which are directly flows in natural water resources through drains without any treatment. The waste water has the heavy quantity of bacteria's, Carbon, Alkaline, salt, oil and solid waste. These are harmful for human and animals and also produce much type of diseases. So, to reduce this disease we decided to stabilize a Sewage treatment plant to remove the solid waste and other polluted material by treatment process from waste water before Flows in natural water resource.

Key Words: Sewage Treatment, Aeration, Oxidation, Disinfection, Waste water Treatment & Filtration.

1. INTRODUCTION

In present the Question, How to protect environment? Is hot topic and Waste water is Important component to produce pollution. In previously 100 years the production of waste water is increases in heavy quantity. Sewage includes the waste water of residential house and also the polluted water of industries. It is a hot topic to the Marine Environment. In last 10 years the marine industries has notable development in the waste water treatment system. Which problem phases during the treatment of waste water? The treatment process required to mix dirty water weather it is mixing with the sea or by converting it from the ocean into natural water. The process of sewage treatment is divided into the three parts after pre-treatment. The oil, Silt & Other solid particles are removed in pre-treatment process before harming the treatment devices of treatment plant. The first step is primary treatment, includes she physical activities and also includes the process of removing mud by sedimentation from waste water. The second step includes the removing process of carbonic and secondary sedimentation of waste water by using bacteria's. The tertiary removes the remaining particles and removes the soluble minerals from the waste water. This step is final treatment step. After these step the waste water can be directly relies to flow in water resources.

2. Literature Review

2.1) Physical Properties Of waste water

2.1.1) Smell: - The pure water doesn't produce the smell. Smell produced when the poisonous material are mixed in water. These materials are harmful for human health. The human receptor cells can recognize the availability of these materials. The eligibility to drink water can be recognizing by smell. There is the Special Contribution of carbonic and non-carbonic materials to smell and taste of sample.

2.1.2) Taste: - The sense of test is mainly due to chemical stimulation of the sensory nervous system. According to custom, the test sensation required salt, sweet, bitter and sour, as per research evidence.

2.1.3) Color: - Availability of color in waste water due to Ion like-Fe & Mg, Human & Peat Material, Plankton & weeds. These Substances are removed to make the water for industrial use or to flow in Water source. The water formed turbidity due to suspended substance. Turbidity is removed during treatment process.

2.1.4) Floatables: - They are founded on surface of water in form of solid waste and undissolved substance, like- oil, Greece, etc. Floatables are founded in two forms.

- Grease ball (particles of materials)
- Liquid component which is applicable to flow in big area.

2.2) Chemical Properties of waste water: -

By the help of chemical properties, can be establish the Better quality and better treatment of waste water. These are some properties and their application to determining the quality of waste water.

2.2.1) PH Value: - The concentration of hydrogen ion in the negative logarithm gives the PH of any sample water. Value of PH is measured as 0 to 14. The PH value less than 7 indicates acidity and more than 7 indicate basicity. It can be measure by electrometrically or calorimetric.

2.2.2) Alkalinity: - It is a method to measure ability of water to neutralize acids and water buffering capacity. Or to resist the value of PH from the addition of base and acid.

2.2.3) Turbidity: - Turbidity is due to fine dissolved substance, like- clay, silt, carbonic & Non-Carbonic materials in small parameter. Due to turbidity, when lighting on the surface of water the light travels on the entire surface and absorb the energy of light. For the determination of turbidity these instruments are used.

(i) Jackson Candle turbidity meter. (ii) Nephelometer

2.2.4) Acidity: - Acidity of water sample is the expressible capacity of designate PH to react with the strong base.

2.2.5) Residual Chlorine: - It is measured as chlorine left in the water after the killing of bacteria and oxidation of organic matter.

2.2.6) Total Solid: - Total solid represent the quantities of suspended substance in water sample, which affect the quality and flow of water. The taste of water also changed due to presence of dissolved substance. Solid can be removed using vaporizing method and total solid can be measured by weight of solid particle stored after vaporizing the water from sample.

2.2.7) Dissolve Oxygen: - A small amount of oxygen will present in the water for the life of aerobic bacteria. It is ten molecules of oxygen per million of water.

2.2.8) Biological Oxygen Demand: - It is the quantity of dissolve oxygen which is required for the life of 5 day's for aerobic bacteria present in water.

2.3) Biological properties of waste water: -

Water quality plays a major role in the abundance of aquatic communities, in species organization, stable productivity and physical status. Their existence is indicative of water quality. Bacteria's, protozoa, Virus and algae are founded in the residential waste water. Plankton, Periphyton, Microsporeum, in vertebral, Fish, Amphibian and Aquatic reptile is of organic group. Aerobic Bacteria divide carbonic material in present of oxygen. Anaerobic bacteria decompose carbonic substance that is locked with free oxygen, such as stools. The product of anaerobic decomposition in the interior of dead body has an excessive odor, in the substance is called septic. Dirty water contains many bacteria which are commonly found in the digestive system of humans. Compared to these, the bacteria causing such diseases are most harmful to public health, such water which is not treated properly. Therefore, it spreads water generator diseases by going to community water sources.

3. SEWAGE TREATMENT PROCESS

Generally a waste water treatment plant has five main steps to treat waste water, but there are Different layouts of design at different places.

3.1) Preliminary treatment: -

The waste water Arrived with the sever system to the plant. Passing of waste water through Bar Screen Before sending in the plant for treatment Process, which removes the sticks, rags and Polythin. After passing through bar screen Water runs in grit chamber with low velocity, the heavy particles like- stone, sand, gravel are settle down in grit chamber and removed them from bottom.

3.2) Primary treatment: -

It is the second step in waste water treatment. In this step the screened waste water flow in primary sedimentation tank, which allowed to separation of oil, greases and fine solid particles. After separation the solid particles and greases are floated at top of the water surface.

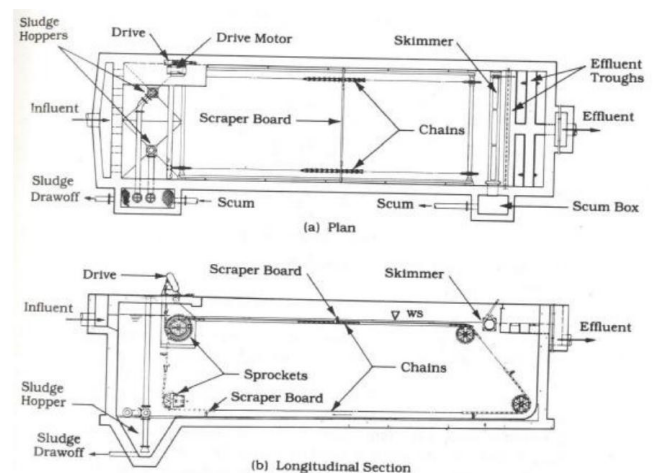


Fig-1: Rectangular Sedimentation Tank

3.3) Secondary treatment: -

This process is called biological treatment process, where the waste water flowed by gravity in Aeration Tank for removing of dissolves organic material from waste water. In this process air bubbles are formed by pressure air, which helps to aerobic bacteria to consume the remaining organic matter.

After this process the liquid mixture are send to final clarifier. Where solid are settle down by gravity and some part of solid are kept in mud treatment process and some parts are sent back in aeration tank to form the bacteria's again for upcoming sewage. Now the treated water is send into disinfection chamber.



Fig-2: Jet Aeration



Fig-3: Aeration through Disk

3.4) Tertiary or Final treatment: -

In this process mostly chlorination or ultra violet irradiation are used for disinfection. After this process treated water is disinfected and can be discharged in river/stream. Or use to waste water reuse activities.

3.5) Mud Treatment or Solid waste treatment: -

Primary solid and secondary solid are formed in primary sedimentation tank and clarifier are sent to digester. Where microorganism uses the organic material as food source and converts it to methane gas (CH₄) and water (H₂O).

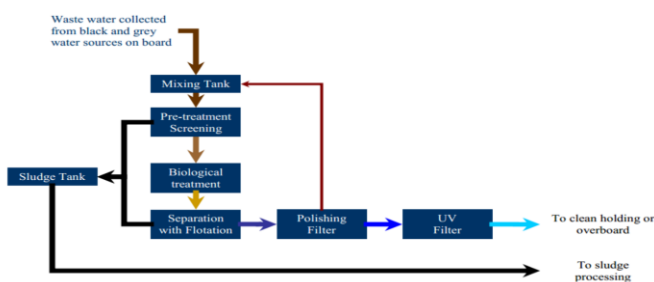


Fig-4: Mud treatment Process

4. STRUCTURAL ELEMENT

4.1) Bar racks: - The purpose of bar racks is to remove the solid substance, Polythin and larger object. Removed solid materials are stored in hopper and send it to landfill. It can be mechanically or manually cleaned.

4.2) Grit chamber: - this is use to remove dense materials such as sand, Brocken glass, silt and pebbles. To avoid abrasion of pumps and other mechanical device.

4.3) Cascade aerator: - It is use for increase the dissolve oxygen in water during run of 250mm pipe.

4.4) Alum dose sand wash water tank: - it is use to generate the flock in waste water. By the flocculent and coagulation the grease and oil are separated from waste water.

4.5) Rapid Gravity filter: - It is used to clear the bottom surface in water purification. Generally it is use in multiple stage treatment system.

4.6) Chlorinator: - It is used for the chlorination of waste water for disinfection process before discharge into receiving stream, river or ocean.

4.7) Clear water reservoir: - It is used to store the treated water before distribution in stream, river, or ocean.

5. CONCLUSION

This paper includes all important point about treatment plant. It will helpful for these areas where the waste water are stored in ditch or flowed in river or ocean by drains, which produce the much type of disease and it will helpful to reduce these effect.

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BIOGRAPHIES



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