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Comparative Study on Activated Sludge Process and Stabilization Pond to Reduce Bod

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Abstract – Due to the increase in population the water usage is increased which directly effects on waste water generation in huge manner. It is very important nowadays to treat such waste water for its reuse and to treat it before discharging into the local bodies such as lake, river, ponds etc. Hence, there is need arises to treat the waste water before discharging it into the environment. Methods for the treatment of waste water are Activated Sludge Process, Trickling Filter, Extended Aeration Sludge Process, Aerated Lagoon, Oxidation Ditch, Waste Stabilization Pond, Up-flow Anaerobic Sludge Blanket, Membrane Bio-Reactor, Moving Bed Bio-film reactor, Sequential Batch reactor and Rotating Biological Contact-discs. In this paper, comparative study between Activated sludge process and Stabilization pond has been carried out to reduce the BOD value.

Key Words: Activated Sludge Process, Stabilization pond, Biochemical Oxygen Demand, Waste water.

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1. INTRODUCTION

1.1 Oxidation Pond

Many techniques are used to handle household wastewater. It can be categorized into two groups: Traditional and unconventional treatment depends on the natural processes of the later refining process that requires first high energy for plants. Traditional waterfall treatment methods include trickling filters, active mud systems, biodisk rotators and aerated lagoons. Non-conventional systems called eco-technology include artificial wetlands and waste stabilization ponds (WSP). In this technology, WSP is widely recommended for developing countries. Oxidation ponds are called stabilization ponds or saline water and work in most small rural areas, where land is readily available.

WSP is suitable for low-income groups at affordable rates and where traditional wastewater treatment is not enough due to lack of resources. In addition to eliminating the diagnosis, the advantage of these systems is the most important reason for their use. The WSP system consists of a series of anaerobic, experimental and maturity ponds or is a series of parallel lines. Pond systems can be used alone, but they usually match with each other. Stabilization ponds are biological treatment methods, whose methodologies and procedures are heavily dependent on the ecological conditions such as temperature, wind speed, and light intensity, which are highly variable and any combination of these ecosystems is usually special in specific places (Mohammed Ali, 2013).

There are many advantages in using this type of biological process, such as its easy operation, low energy requirements, low maintenance of equipment and thickening of the good conduction. However, in the case of biochemical oxygen demand (BOD) and Suspended solid (SS), the effluent quality of the mixed film system is relatively poor compared to the suspended growth systems (Phuntsho, et. al.)

WSP is suitable for low-income countries as the traditional wastewater treatment process is not enough because of their low cost and due to lack of resources. In addition to eliminating the diagnosis, the advantage of these systems is the most important reason for their use. The WSP system consists of a series of anaerobic, experimental and maturity ponds or is a series of parallel lines. Pond systems can be used alone, but they are generally used in combination with each other (Ullrich, 1967).

1.2 Activated Sludge Process (ASP)

In the presence of oxygen in unnecessary atmospheres, deficiency of the active organisms can be determined after the disinfection has been created. ASP contains a large number of bacteria and other organisms, and acts as a fertilizer component while mixing insecure equipment, which works in two types: A Organic solid makes oxidize Seconds promote

coagulation and flocculation and convert into colloidal and dissolved solids of settlable solids (Joshua, et. al., 2015).

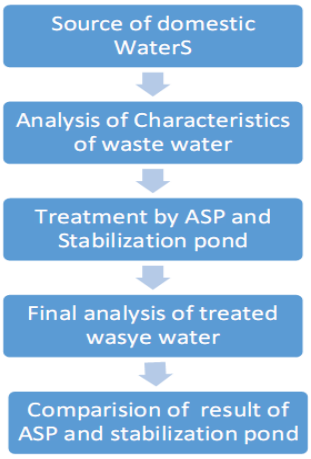
The activated sludge process was named because it contains the production of active micro-organisms that are capable of stabilizing the waste below the aerobic conditions. Taking tank, contact time mix and micro-organisms suspension tributary wastewater is done in conjunction, usually referred to as MLSS Mixed Liquor suspended solids or fluid mixing volatile suspended solids (MLVSS). In the process, mechanical equipment is used to mix and transfer oxygen. Mixed liquor flows into clarifier where microorganisms are suspended and thick. Due to the presence of active microorganisms, the biomass deposited at the bottom described as active sludge comes back to the gas tank to keep biodegradation of rich organic material. These substances are composed of a part that gets thickened daily or regularly collected together in the biomass tidal evaporation biodegradable substance (Hatfield, 1958).

2. METHODOLOGY

Source: The collection of waste water sample sample from sewage treatment plant situated in the JSPM College campus, Wagholi, Pune.

The purpose of the project is to study two different technologies Activated Sludge Process and Stabilization Pond to reduce the biochemical oxygen demand (BOD).

Domestic wastes generated through various human activities are different and complex. These wastes on discharge affect the normal life of a stream or normal functioning of sewerage and sewage treatment plants, unless pre-treated at the source point itself. The waste water from domestic have proportion of suspended solids, dissolved organic and inorganic solids, BOD, COD and their different constituents may be or may not be in same proportion.



Initial Property of waste water

Property	Value
BOD	936 l

3. RESULT

Time in Days	For ASP	For Oxidation Pond
1st	936 mg/l	936 mg/l
5th	468 mg/l	733 mg/l
10th	93.6 mg/l	512 mg/l
15th	30.3 mg/l	330 mg/l
20th	29.2 mg/l	210 mg/l
25th	29.2 mg/l	210 mg/l

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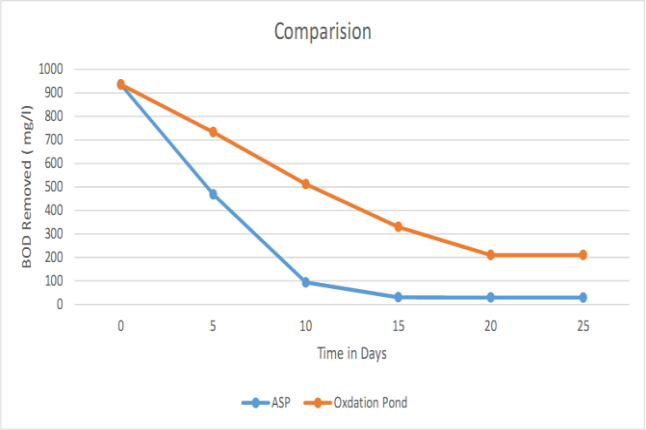

4. CONCLUSION

I. The treatment of Domestic sewage with Activated Sludge Process (ASP) is an effective and economical technology as compared to oxidation pond.

II. The land area required is minimum and installation cost, operation and maintenance cost is minimum. Since the primary settling tank, sludge digester etc., are not required in this process.

III. ASP is a cost effective and self-sustaining technology.

IV. Good quality effluent is obtained with ASP technology.

V. Oxidation Ponds require large area and Sludge accumulation will increase in cold climates due to reduced microbial activity.

VI. Maintenance and Operation cost are high for oxidation pond.

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