**STUDY OF CONVENTIONAL WATER TREATMENT PLANT**

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**Abstract** --For providing continuous and good quality of water to all the regions in Maharashtra through out the year, Govt. of Maharashtra has constructed new water treatment plants during the past few years. Performance of WTP is an essential parameter to be monitored and evaluated for the better understanding of design and operating difficulties in water treatment plants. The conclusions of these evaluations may determine required recommendations and highlight modification requirements for continuous design and operating schemes. The professed goal of World Health Organization—to supply potable

water to the poorest of the poor in the developing countries by the year1990—appears to be quite an optimistic one in view of the existing situation in the developing countries, where potable water is still out of the reach of 80%of the populace. Supplying potable water to the rural population in these countries is quite a gigantic task owing to lack of physical and institutional resources. Any major effort at providing safe potable water to rural populations

should first aim at improvement of the small community water supply systems.

Small community water supply systems in these countries generally include:

(1) Groundwater supplies; (2) rain water storage basins; and (3) surface water

storage basins.

**INTRODUCTION**

Water is a basic human need. Providing safe and adequate quantities of the same for all rural and urban communities is one of the most important undertaking for the public works department. Water is one of the most important of environment. Water may be polluted by physical .chemical and bacterial agents. Therefore protected water supply is most essential to avoid health hazard. The well planned water supply scheme is a prime and vital element of a country’s social infrastructures as on the health and wellbeing of its people.

Water is broadly classified in two categories, surface water and ground water .

The sources surface water are river ,stream ,lakes ,impounded reservoir, canal ,etc .and the source of ground water are tube well, spring infiltration gallery etc. The impurities present in surface waters are essentially of colloidal nature and are classified as turbidity or micro-organism. Turbidity adds colour, taste and opacity to water while micro-organisms are responsible for disease like cholera, typhoid etc. The dug well water is partly surface and partly ground water. Groundwater has mostly dissolved impurities. The dissolved impurities are mainly due to presence of salts of iron and calcium and magnesium sodium arsenic and nitrates.

The water supplied should be Potable and Wholesome .Absolute pure water is never found in nature, but invariable contains certain suspended, colloidal and dissolved impurities in varying degree of concentration depending upon the source .Hence treatment of water to absolute removal of these impurities become indispensable.

The designed water treatment plant has a perennial river as the basic source of water .The type of treatment to be given depends upon the given quality of water available and the quality of to be served. However such an extensive survey being not possible in the designed water treatment plant. It is assumed that all kinds of treatment processors are necessary and an elaborate design.

Throughout the world supply of water to the rural population has been a challenging risk. In India the water storage one of the major issues coming from the rural areas. Due to this the government of Andhrapradesh has designed and constructed a number of slow sand filtration for rural water supply schemes in the states. Large town can afford high treatment expenses communities.

The aim of water treatment is to produce and maintain water that is hygienically safe, aesthetically attractive and potable in an economical manner. The treatment of water would achieve the desired quality should not be confined to the end of the treatment facilities but should be extended to the point of consumer’s use. The method of treatment to be employed depends on the characteristics of the raw water and the desired standards of water quality. The unit operation and unit processes in water treatment constitute aeration, flocculation, clarification, filtration, water condition and disinfection.

**OBJECTIVES**

The objectives of water works management is to ensure that the water supplied is free from pathogenic organism, clear, potable and free from undesirable taste and odour, of reasonable temperature ,neither corrosive nor scale forming and free from minerals which could produce undesirable physiological effects.

**FLOW CHART**



**METHODOLOGY**

1. **SCREENING:**

The main objective of screening is removal of coarse solids (pieces of woods, plastics, papers, rags, leaves, roots, etc.) for the Protection of pump, valves, pipe lines, impellers.

1. **AERATION:**

Aeration involves bringing air or other gases in contact with water to strip volatile substances from the liquid to the gaseous phase and to dissolve beneficial gases into the water. The volatile substance that may be removed includes dissolved gases, volatile organic compounds, and various aromatic compounds responsible for tastes and odors. Gases that may be dissolved into water include oxygen and carbon dioxide. Purposes of aeration in water treatment are:

* to reduce the concentration of taste and odor causing substances, such as hydrogen sulfide and various organic compounds, by volatilization / stripping or oxidation,
* to oxidize iron and manganese, rendering them insoluble.

**Types of Aerators:**

Four types of aerators are in common use: (i) Gravity aerators, (ii) Spray aerators, (iii) Diffusers, and (iv) Mechanical aerators.

1. **Gravity Aerator:**

Gravity Aerators utilize weirs, waterfalls, cascades, inclined planes with riffle plates, vertical towers with updraft air, perforated tray towers, or packed towers filled with contact media such as coke or stone.

1. **Spray Aerator:**

Spray aerator spray droplets of water into the air from moving or stationary orifice or nozzles. The water raises either vertically or at an angle and falls onto a collecting apron, a contact bed, or a collecting basin. Spray aerators are also designed as decorative fountains. To produce an atomizing jet, a large amount of power is required, and the water must be free of large solids.

1. **Diffused-Air Aerators**:

Water is aerated in large tanks. Compressed air is injected into the tank through porous diffuser plates, or tubes, or spargers. Ascending air bubbles cause turbulence and provide opportunity for exchange of volatile materials between air bubbles and water.

1. **Mechanical Aerator:**

Mechanical aerators employ either motor driven impellers or a combination of impeller with air injection devices. Common types of devices are submerged paddles, surface paddles, propeller blades, turbine aerators, and draft-tube aerators.

**C.COAGULATION AND FLOCCULATION:**

Coagulation and Flocculation may be broadly described as a chemical / physical process of blending or mixing a coagulating chemical into a stream and then gently stirring the blended mixture. The overall purpose is to improve the particulate size and colloid reduction efficiency of the subsequent settling and or filtration processes.

**D.FILTRATION:**

Filtration is the most relied water treatment process to remove particulate material from water. Coagulation, flocculation, and settling are used to assist the filtration process to function more effectively. The coagulation and settling processes have become so effective that some times filtration may not be necessary. However, where filtration has been avoided, severe losses in water main carrying capacity have occurred as the result of slime formation in the mains. Filtration is still essential.

Types of filter which is commonly used water treatment plant.

1. Rapid sand filter
2. Slow sand filter**.**

**E.DISINFECTION:**

Chlorination became the accepted means of disinfection, and it is the single most important discovery in potable water treatment. Recently, however, the concern over disinfection by-products (DBPs) produced by chlorine has given new impetus to investigating alternative disinfectants. Disinfection of potable water is the specialized treatment for destruction or removal of organisms capable of causing disease; it should not be confused with sterilization, which is the destruction or removal of all life.

**CONCLUSION**:-for providing safe water the importance of each unit in water treatment plant is studied.

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