L.NO: 03

Topic: Municipal water Treatment - primary Treatment

Treatment of water for Domestic Supply (or) Municipal water Treatment

Introduction:

* Rivers and lakes are the most common sources of water by municipalities.

* These water should be free from colloidal impurities, domestic sewages, industrial effluents and disease producing bacterias.

* Hence domestic supply of water involves the following stages in the purification processes.

Sources of water

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Screening

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Aeration

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Sedimentation

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Coagulation

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Filtration

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Sterilisation (or) Disinfection

Primary Treatment

* **Screening:**

✓ It is a process of removing the floating materials like leaves, wood pieces etc from water.

✓ The raw water is allowed to pass through a screen, having large number of holes, which retains the floating materials and allows the water to pass.

* **Aeration:**

→ The process of mixing water with air is known as Aeration.

→ The main purpose of aeration is

* to remove gases like Co_2, H_2S & other volatile impurities causing bad taste and odour to water.
* to remove ferrous and manganous salts as insoluble ferric and manganic salts.

* **Sedimentation:**

• It is a process of removing suspended impurities by allowing the water to stand undisturbed for 2-6hours in a big tank.

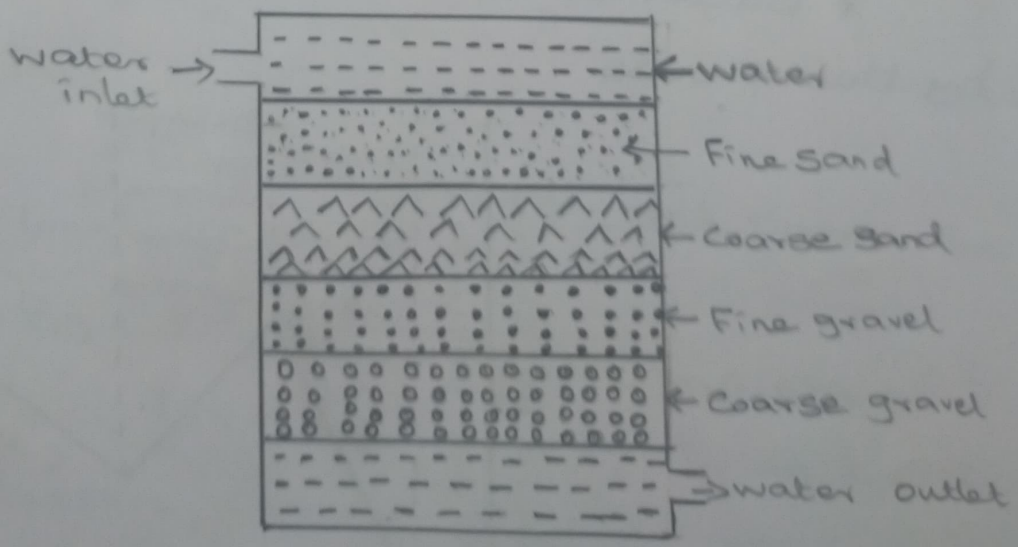
• Most of the suspended particles settle down at the bottom, due to forces of gravity and they are removed.

• It removes only 75% of the suspended impurities.

* Coagulation

- Finely divided clay, silica etc do not settle down easily and hence cannot be removed by sedimentation.
- Such impurities are removed by Coagulation method.
- In this method, certain chemicals called Coagulants like alum, $Al_2(SO_4)_3$ etc are added to water.
- When the $Al_2(SO_4)_3$ is added to water it gets hydrolysed to form a gelatinous precipitate of $Al(OH)_3$.
- The gelatinous precipitate of $Al(OH)_3$ entraps the finely divided and colloidal impurities settles to the bottom and can be removed easily.

* Filtration



* It is the process of removing bacteria, Colour, taste, odour and Suspended particles, by passing the water through filter beds containing fine Sand, Coarse Sand and gravel.

* The Sand filter Consists of a tank Containing a thick top layer of fine Sand followed by Coarse sand, fine gravel & Coarse gravel.

* When the water passes through the filtering medium, it flows through the various beds Slowly.

* The rate of filtration decreases Slowly due to the clogging of impurities in the pores of the Sand bed.

* When the rate of filtration becomes very Slow, the filtration is stopped and the thick top layer of fine Sand is Scrapped off and replaced with clean Sand.

* Bacterias are also partly removed by this process.