

## EFFLUENT TREATMENT – CONCLUDING PART

REF: TT/ MAY 2021/ WK 1

### Sludge Disposal

The residue that accumulates after effluent treatment is called sludge. Sludge is the solid, semi-solid, or slurry material produced as a by-product of wastewater treatment processes. This residue is commonly classified as primary and secondary sludge. Primary sludge is generated from chemical precipitation, sedimentation, and other primary processes, whereas secondary sludge is the activated sludge resulting from biological treatments.

### Dewatering of sludge

Sludge is dewatered before disposal. Though dewatered sludge contains good amount of water, still with that moisture content, sludge can be handled as a solid material. Dewatering of sludge is done on Sludge-drying beds. Sludge slurry is spread on an open bed of sand and allowed to remain until dry. Drying takes place by a combination of evaporation and gravity drainage through the sand. A piping network built under the sand collects the water, which is pumped back to the head of the plant. After drying, the sludge which is then called sludge cake is removed from the sand.

Partial amount of sludge is returned back to the aeration tank from thickening unit through recycle tank called return sludge tank and disperse tank. Sludge again oxidized to minimize the pollution from sludge. Advantage of recycle sludge to aeration tank is to utilize the bacteria of sludge in aeration.

### Disposal

The final destination of treated sewage sludge usually is the land. Dewatered sludge can be buried underground in a sanitary landfill. Since sludge may contain toxic chemicals, it is not spread on land where crops are grown for human consumption. Where a suitable site for land disposal is not available, sludge is burnt and the organic solids are converted into inert ash. The ash is less in volume and easy to dispose of. The disposal is done based on the guidelines given by the government bodies.

### Summary

In a textile effluent treatment plant, the parameters are tested at ETP inlet point and ETP outlet point. At ETP outlet point, the treated water is checked mainly for pH, color, COD, BOD and TSS (Total Suspended solids). These parameters are used to monitor the effluent treatment plant efficiency.



**Permissible limits for disposal**

- pH – 5.5 – 9.0
- BOD\* – <30 PPM
- COD\*\* – <250 PPM
- TSS \*\*\* - <100 PPM
- MINERAL SALT – 0.5%

Ref: web.iitd.ac.in

\* **Biological Oxygen Demand (BOD)** – The Biological oxygen demand is the amount of oxygen consumed by bacteria and other microorganisms while they decompose organic matter under aerobic conditions i.e in presence of free oxygen.

\*\* **Chemical Oxygen Demand (COD)** - The Chemical oxygen demand is the amount of oxygen consumed to chemically oxidize organic water contaminants to inorganic end products.

\*\*\* **Total suspended solids (TSS)** – Total suspended solids are particles that are larger than 2 microns found in the water column.

The efficiency of individual units of an effluent treatment plant determines the overall performance of the plant and the final effluent quality. Water samples are collected from the main units of the ETP and are analyzed for key parameters. The results are used to diagnose problems with the treatment units and to suggest modifications whenever required. A methodology is developed for evaluating the performance of the different treatment units and also the entire ETP on a regular basis to improve the performance so that the effluent leaving the factory meets national standards.

In textile clusters (Which is spread all over India), the textile units are treating the effluents through Common Effluent Treatment Plants (CETP) which are established, operated and maintained by the general bodies or trusts as per the government guidelines.

References:

1. <http://textilefashionstudy.com/>
2. <http://neoakruthi.com/>
3. <https://www.ijert.org/>
4. <https://www.fibre2fashion.com/>
5. <https://www.longdom.org/>

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Last week`s Answers: 1) DIGESTION 2) ION EXCHANGE 3) ADSORPTION 4) THERMAL

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