

Study Of Common Effluent Treatment Plant At Five Star Midc, Kagal

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Abstract—Common Effluent Treatment Plant (CETP) located at kagal five star MIDC, Kagal. Wastewater collected from four textile industries in their estate. Present study focused on performance of common effluent treatment plant. Various inlet and outlet parameters are analyzed such as pH, Total dissolved solids (TDS), and Chemical oxygen demand (COD), Biochemical oxygen demand (BOD). Treated effluent from CETP is discharge to the high rate transpiration system (HRTS) site near CETP.

- pH-pH meter
- TDS-Digital turbidity meter
- COD-Reflux
- BOD-titration by adometric

Keywords— CETP, textile wastewater, treatment unit

III. TREATMENT UNITS

I. INTRODUCTION

"Common Effluents Treatment Plant" situated in Pune-Bangalore National Highway No.4, Five Star MIDC, Kagal, Kolhapur. In Kagal-Hatkanangle Industrial area different type of small, medium and large-scale industries are located. The major part of wastewater generated is from large textile based industries. CETP was constructed to treat the effluents from industries at Five Star MIDC in 2007–08. The proposed CETP is designed for 10 MLD of waste water with the provision of 20 % hydraulic overload for safely and provision is kept in layout so that in future it can be expanded to 15 MLD capacities. Plant receives influent from industries such as Raymonds, Suktas, Oswal and Endocount. At the current moment plant is operated and maintained by "thermax Ltd. Wastewater received from respective industries is suitable for biodegradation and hence a treatment based on conventional Biological Degradation of waste water. In addition to take care of incoming concentration of suspended solids physico chemical treatment followed by clarification process was included before biological treatment to meet the final discharge norms tertiary treatment having oxidation tank was also included in the treatment. MIDC has developed site which is near to CETP where treated effluent is disposed off and total area of site is around 40Acre planted with nilgiri trees. Hazardous solid waste is send to ranjangaon.

II. MATERIAL AND METHOD

The samples were collected at inlet and outlet of each unit and analysed by standard methods for examination of wastewater parameters. Daily samples were collected in plastic bottles and rinsed with effluent at sampling site. The inlet sample consist of waste influent and outlet consist of treated effluent. Parameters were analysed like pH, BOD, COD, TDS. The wastewater flow is measure by digital electronic flowmeter.

Methods for sample analysis.

A. Equalization and Physical Treatment

The waste water is received in waste collection Sump having arrangement of screen chamber & grit removal chamber other floating foreign impurities as well as any suspended larger particles which can damage internal part of pumps and other rotating equipment are removed. From waste Water collection sump waste water is pumped to Equalization Tank. Before equalization tank effluent is passed through oil and grease trap for the removal of floating and insoluble oil and grease particles from waste oil and grease trap is provided. Equalization tank is provided to take care of variation in effluent quality and quantity. Equalization tank is provided with 8 hours hydraulic retention time. Equalization tank will also be provided with floating type submerged mixer for complete mixing of waste water.

B. Physico-Chemical Treatment and Primary Clarification

Equalized effluent is transfer to physico Chemical Treatment Section of the CETP. It consists of treatment of waste water using chemicals and flocculants mainly to precipitate, flocculated and coagulated part of waste water components and to removed using gravity settling in primary clarifiers Clear overflow from primary clarifier is conveyed to Aeration tank for biological treatment. Settled sludge at the bottom of the primary clarifier is transferred to primary sludge sump.

C. Biological Treatment

Activated sludge process is selected for biological treatment of effluent. Here, soluble BOD is stabilized by oxidation of organic matter by microorganism. Microorganism is supplied with oxygen and nutrients necessary of their metabolism. Oxygen required is provided by air blower through non-clog type membrane diffusers to achieve higher rate of oxygen transfer efficiency. Mixed liquor overflow from aeration tank is taken in to secondary clarification process for the separation of microorganism form treated wastewater under gravity. Bottom sludge from secondary clarifier is returned back to aeration tank.

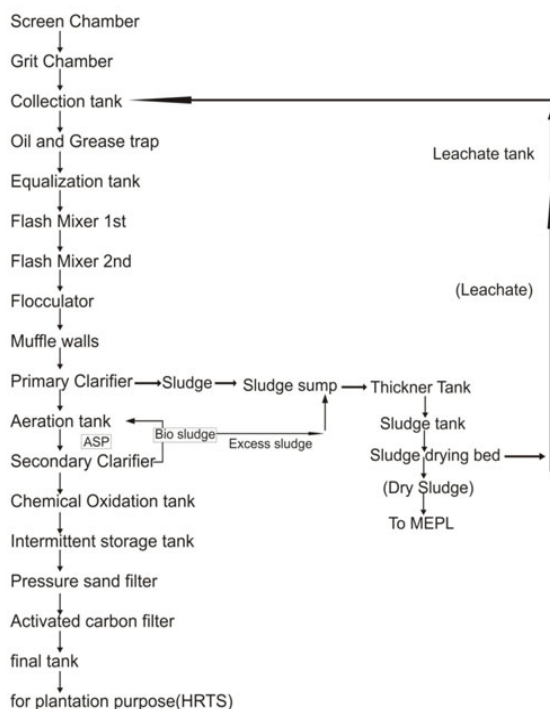
D. Tertiary Treatment

Clear wastewater after biological treatment shall be subjected to tertiary treatment. The tertiary treatment consists of chemical oxidation, pressure sand filter and activated carbon filters. Effluents from biological treatment shall be passed through chemical oxidation tanks where preferably sodium hypochlorite dosing is carried out for chemical oxidation of effluent to enhance colour removal from the effluent. Provision of oxidation with Hydrogen Peroxide and pH correction with acid and alkali is also kept if found necessary during actual treatment of waste water. Effluent from chemical oxidation tank is collected in intermittent storage tank. From here effluent is further subjected to treatment through pressure sand filter and activated carbon filter. Pressure sand filter removes suspended solids to much lesser level and activated carbon filter provides polishing treatment for color and COD removal from the waste water so that final treated waste water meets the discharge norms specified by MPCB. Effluent is disposed of to HRTS site of MIDC.

E. Sludge dewatering

Sludge slurry from bottom of primary and secondary clarifier shall be collected in primary sludge sump and bio sludge tank respectively. From primary sludge sump sludge slurry is transferred to sludge thickener to increase solid content of sludge slurry. From sludge thickener bottom sludge slurry is sent to sludge drying beds for further water removal and drying of sludge. Overflow of thickener is fed to inlet of primary clarifier for further treatment. Leachate collected from the bottom of thickener is collected in leachate collection tank. Leachate from leachate collection tank is directly pumped into flash mixer for further treatment in the plant. Dried sludge from sludge drying bed is removed, packed and then stored in sludge storage area for disposing it to the TSDF site at Ranjangaon/Taloja for secured land filling.

F. Treatment flowchart



IV. RESULTS

Inlet and outlet samples were analyzed for various parameters and results obtained are mentioned in table no 1. Analysis for inlet and outlet samples was carried out for period of 60 days.

TABLE I. VALUES FOR INLET AND OUTLET PARAMETERS

Parameters	Inlet (mg/lit)	Outlet (mg/lit)
pH	8.06	7.4
BOD	180	24
COD	808	240
TDS	2700	2000

CONCLUSION

The study indicates that there is efficient reduction in parameters from treatment units of CETP. Upto 75% COD reduction obtains in treatment process. Removal of oil and grease in desirable range.