T2. PRIMARY PROCESSING, STANDARDISATION AND QUALITY CONTROL
T2.01

TREATMENT SYSTEM FOR EFFLUENT DISCHARGED FROM LATEX CENTRIFUGING FACTORIES

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This paper discribes design, construction and evaluation of a commercial effluent treatment plant put up at Kodumon Group Latex Centrifuging Factory of M/s. Plantation Corporation of Kerala Ltd.

The effluent treatment system consists of a rubber trap, compositing pond, chemical treatment device, primary settling tank, oxidation ditches, secondary and tertiary settling tanks, sand filter and final holding pond. The function of the rubber trap is to retain suspended and settleable solids. The effluent from the rubber trap is collected in a compositing pond, the purpose of which is to average out the quality of the receiving effluent. The effluent from the compositing pond is then pumped into the chemical mixing device where lime and flocculating agent are added. The effluent is then allowed to settle in the primary settling tank and the clear supernatant liquor is allowed to flow into Oxidation Ditch I where it is subjected to aeration using a cage rotor. The treated effluent is then allowed to flow into the secondary settling tank where the sludge settles down and the clear effluent overflows into Oxidation Ditch II. The effluent is again aerated using a cage rotor. The final treated effluent is then allowed to overflow into the tertiary settling tank where the sludge settles at the bottom and the clear treated effluent is then pumped into the sand filter to remove any suspended solids. The final filtered effluent is then collected in a holding pond from where it is allowed to discharge into the nearby stream. The settled sludge in the primary settling tank is pumped into a drying bed to dewater the sludge. The sludge from the secondary and tertiary settling tanks is pumped back into Oxidation Ditch I and Oxidation Ditch II respectively to maintain the MLSS in the ditches.

The quality of the effluent from the compositing pond is considered as the quality of the raw effluent. Grab samples were collected from various sections of the treatment plant on several occasions and tested for various parameters and the average results are taken for assessing the performance of the system. It is observed that chemical treatment reduces suspended solids by more than 90 per cent. COD, BOD, total and ammoniacal nitrogen by about 20 per cent and phosphate by 85 per cent whereas sulphide content is seen slightly increased. By aeration in Oxidation Ditch I a reduction of about 87 per cent in COD and 91 per cent in BOD is achieved. Reduction in the total and ammoniacal nitrogen by about 28 per cent and 39 per cent respectively was also effected compared to that in the clarified effluent. However, it is seen that the total phosphates remain almost constant, whereas sulphide content is reduced by about 66 per cent and dissolved solids by 29 per cent. A second stage aeration in Oxidation Ditch II further reduces the COD and BOD by about 67 per cent and 93 per cent respectively and the total and ammoniacal nitrogen by 42 per cent and 46 per cent respectively and the dissolved solids by 26 per cent. Aeration in Oxidation Ditch II reduced the sulphide content to negligible level. The phosphate content remains more or less constant compared to that in Oxidation Ditch I. A reduction of about 38 per cent in COD and 28 per cent in dissolved solids was also seen in the final effluent. However, actual values observed for total and ammoniacal nitrogen in the final treated effluent are more than that specified for discharge into inland surface water. These values can easily be brought under the limits specified if proper deammoniation of skim latex is carried out.

From the study it can be seen that with factories where land is limited, chemical treatment, followed by two stage aeration, can give treated effluent meeting the standards specified by Pollution Control Board for discharge into inland surface water.

If sufficient land is available for irrigation chemical treatment followed by a single stage aeration will be sufficient to meet the standards. Further chemical treatment followed by aeration eliminates the development of fowl odour which is quite common with centrifuging plants.