

REPORT ON PERFORMANCE EVALUATION OF
SEWAGE TREATMENT PLANT
TIRUNELVELI, TAMILNADU

As per mandate of Ministry of Environment & Forest, New Delhi, Central Pollution Control Board has taken up study on performance evaluation of Sewage Treatment Plants (STP) existing in all the states of the country.

Hence, a team of officials from CPCB, South Zonal Office, Bangalore carried out a set of monitoring of the Sewage Treatment Plant (STP) in Tirunelveli, Tamilnadu during 28 August, 2013.

Tirunelveli Corporation is the administrative Head Quarters of Tirunelveli District, Tamilnadu located on the banks of River Thamiraparani. The population of the Corporation as per 2001 census is 4.10 lakhs. In Thirunelveli, wastewater generated is about 7.2 MLD.

The corporation is divided into four zones, sewage received from each zone is conveyed through a network of sewer line and collected in the wet wells provided in respective zonal pumping stations. From there the sewage is pumped with suitable pumpsets to the Sewage Treatment Plant constructed near Ramayanpatti at about 5.5Km from the city. The capacity of the STP is 24.2 MLD, which was commenced from April 2007. The salient details of the unit including the details of the zones, total area covered is given in Annexure I.

CPCB officials inspected the Tirunelveli Corporation Sewage Treatment Plant during August 28, 2013 in order to study the overall performance of the unit. Grab samples were collected from the unit.

The design capacity of the plant is 24.2 MLD. The treatment process adapted is Waste Stabilization Pond method with ten days retention period. The unit consists of inlet chamber, screen chamber, grit chamber, parshall flume, distribution chamber followed by two nos. of anaerobic pond, two nos. of facultative ponds and four nos. of maturation ponds. The dimensions of the unit are given in the table 1.0. The treated water is used for irrigation purpose, which passes through Kodakan Channel. The flow chart of the STP is shown in the figure below:

TIRUNELVELI UGSS STP-Waste Stabilization Pond

24.2MLD

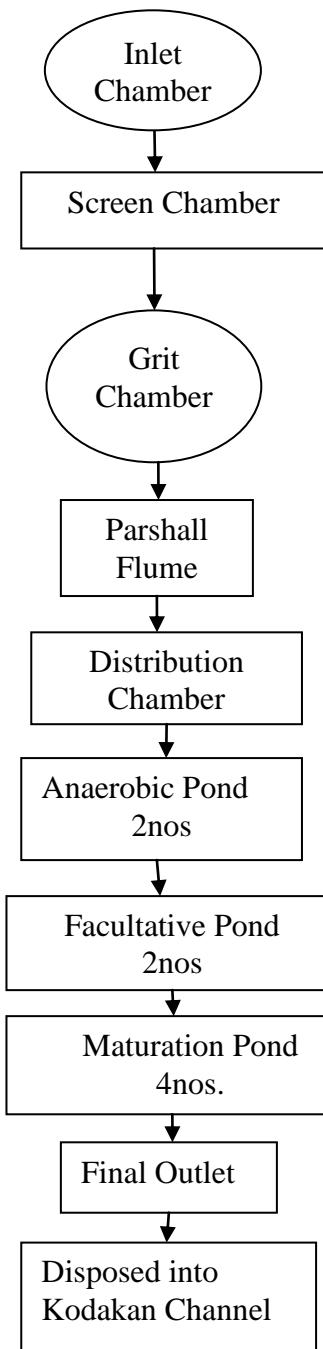


Table 1.0 Details of the treatment units

S.No	Name of Pond	Size in meters			Detention period	No.of units
		Length	Breadth	Depth		
1.	Anaerobic Pond	108.50	38	3	1 day	2
2.	Facultative Pond	315	110	1.5	4 days	2
3.	Maturation pond I/I	195	117	1.5	5 days	2
4.	Maturation pond I/II	156	125	1.5		
5.	Maturation pond II/I	150	128	1.5		
6.	Maturation Pond II/II	156	125	1.5		

- During the visit, it was observed that the one of the anaerobic pond was kept standby in order to remove the sludge. As informed by the unit the sludge from pond was not cleaned since from its commencement (2007).
- The treated effluent from the maturation is disposed to kodakan channel, which in turn used for farmland and irrigation purpose.
- The unit is operating without any consent.

Samples at the outlet were also collected for microbiological parametric analysis.

RESULTS & DISCUSSIONS

- The pH at the inlet and outlet is varying from 6.7 to 6.9 thus showing no much variation.
- The EC at inlet and outlet of the STP is 1366 μ s/cm and 725 μ s/cm respectively.
- The BOD and COD of the effluent are well within the permissible limit of 20 mg/L and 250mg/L, with the efficiency of 84% and 70.5% respectively.
- The NH₃-N in the outlet sample is 1.7 mg/L and the NH₃-N removal efficiency is 96%, which indicates the good quality effluent.
- The TSS in the outlet is 50mg/L, which exceeds the limit of 30mg/L.

Sl. No	Parameters	Inlet	Outlet
1.	pH	6.7	6.9
2.	EC (μg/cm)	1366	725
3.	TSS (mg/L)	128	50
4.	TDS (mg/L)	707	477
5.	BOD (mg/L)	107	17
6.	COD (mg/L)	390	115
7.	NH₃-N (mg/L)	43.7	1.7

Recommendations:

- The STP is operating without any consent hence, the unit shall apply for consent under the Water (Prevention and Control of Pollution) Act, 1974 and get the valid consent from concerned state board.
- The unit shall remove the sludge frequently and increase the retention time in order to get the better efficiency in terms of TSS.
- The unit shall remove the waste from Screen and grit chambers frequently and shall give to municipal solid waste rather than dumping inside the premises.

Photos of the Tirunelveli Corporation Sewage Treatment Plant (24.2 MLD)



Fig 1: Inlet chamber



Fig 2: Screen Chamber



Fig 3: Grit Chamber



Fig 4: Solid waste from screen chamber is removed and dumped inside the unit creating unaesthetic condition.



Fig 5: Anaerobic pond 1



Fig 6: Anaerobic pond 2 in standby condition



Fig 7: Anaerobic pond outlet



Fig 8: Facultative pond 1



Fig 9: Facultative pond 2 in standby mode



Fig 10: Facultative pond showing more algal growth on the surface



Fig 11: The maturation pond the final treatment unit of the plant.

