6.0

Sewage Pollution Control

6.1 Performance Monitoring of Sewage Treatment Plants in Haryana and Delhi

The CPCB has been assigned a project by NRCD, MoEF under Yamuna Action Plan on performance monitoring of sewage treatment plants in Haryana and Delhi. Four STPs are located in Haryana and one in Delhi. These STPs are regularly being monitored since the Year 1999 under this project. During the year 2007 also these STPs were monitored every month on 12 hourly basis for pH, SS, BOD (filtered & unfiltered), COD, phosphate, NO_3-N, NH_3-N, TC & FC. The data is regularly reported to MoEF and respective authorities of STPs. It is noted that the operation and maintenance of various STPs need to be streamlined.

6.2 Performance Monitoring of Oxidation Ponds based STPs under NRCD Project

Seven oxidation pond based and one UASB based STPs located at Mathura, Agra and Etawah in U. P. were assigned performance monitoring by NRCD, MoEF under Yamuna Action Plan. The STPs are monitored on monthly basis for DO, pH, SS, TDS, BOD, COD, TC & FC. The data is being reported to MoEF and U. P. Jal Nigam on regular basis.

6.3 Performance Monitoring of Sewage Treatment Plants in Bangalore and Vijaywada

Bangalore city generates about 800 MLD of domestic wastewater, which is treated at 14 sewage treatment plants are constructed and maintained by BWSSB. These treatment plants are located at Vrishabavathy Valley, Koramangala-Chellaghatta Valley near the HAL Airport, Hebbal Valley STP on Bellary road, Kempambudhi, Mailasandra, Nagasandra, Madivala, Kadabeesanahalli, Yelahanka, Raja Canal, Jakkur, K.R. Puram, Lalbagh and Cubbon Park. Total designed capacity of all STPs together is 718 MLD of sewage. However, presently these operate at around 50% of designed capacity except one or two and few are just circulating the sewage to keep the plant in operation. CPCB South Zonal Office Bangalore monitored nine STPs to study the overall performance

Presently the sewage treatment plants at Bangalore are operating at around 50% of designed capacity

of the treatment system and the salient observations are as under:

- The pH at the inlet (range: 6.6 to 8.0) and at outlet (range: 6.5 to 8.5) varied very little and the EC remains stable ((800-900 µS) at most of the STPs with few exceptions, where it exceeds 1000 µS.
- The BOD and COD levels at the outlet are well within the permissible limit at most of the units. The percentage of BOD and COD removal varied from 80.5 to 98.4 % and 79.4 to 97.0 % respectively.
- The DO in the aeration tanks was found to be adequate. The MLSS to MLVSS ratio is varying from 50-85% indicating good microbe to organic ratio.
- There is an increase in Nitrates-N in all the outlet samples except in Madivala STP and K&C valley unit-I revealing good oxidation level in the treatment.
- The inorganic salts have increased at almost all the outlets, which clearly indicate excessive use of salts for treatment. The phosphate reduction noticed in all STPs would be either due to treatment or extended aeration/storing/ recycling of the wastewater.

Vijayawada city in Andhra Pradesh generates about 100 MLD of

Table 6.3 Performance study of sewage treatment plants located in Bangalore and Vijayawada cities

Name of the STP	Location	pH	EC µs/cm	BOD mg/l	COD mg/l	TDS mg/l	TSS mg/l	Na+ mg/l	K+ mg/l	NH_3-N mg/l	NH3-N mg/l	SO_4 mg/l	Total PO_4
BANGALORE CITY													
Vrishabhavathi	Inlet	7.2	900	1110	6480	7568	440	116	24	0.16	29.4	31	3.02
Valley (180 MLD)	Outlet	7.8	900	32.5	240	1484	52	42	40	22	17.3	34	0.6
Mailasandra	Inlet	7.5	900	820	6720	1010	660	35	30	1.8	34.6	25	4.7
(75 MLD)	Outlet	8.5	900	18	200	672	190	73	49	21.8	4	43	1.3
Madiwala	Inlet	8.0	900	187	408	586	290	114	23.5	2.2	35.2	12	1.5
(4 MLD)	Outlet	8.4	800	4	84	515	4	102	22	1.3	36.3	18	1
K&C Valley	Inlet	8.0	900	290	780	584	294	117	26.5	2.5	30	28	3.4
(218 MLD)	Outlet	8.2	900	7	68	500	6	101	21.5	5	19.6	15	0.2
K&C Valley	Inlet	7.9	1000	210	360	566	132	97	22.5	1.3	42.7	13	3.2
(30 MLD)	Outlet	8.2	800	5	52	529	1	105	20.5	1.3	7.5	19	0.42
Raja Canal	Inlet	7.5	1390	268	752	2044	240	126	27	0.06	57.3	62	2.7
(40 MLD)	Outlet	7.3	1420	< 10	40	952	24	150	31	10.1	35.3	99	0.3
Yelahanka	Inlet	6.6	1010	190	504	600	132	1804	21	0.06	31.3	28	0.9
(10 MLD)	Outlet	6.5	1030	37	96	640	24	51	22	5.9	17.3	37	0.03
Nagasandra	Inlet	-	-	304	746	1440	172	461	96	-	69	73.5	7.7
STP(20 MLD)	Outlet	-	-	5	56	1680	28	476	110	-	0.7	132	1.5
Hebbal	Inlet	-	-	461	889	686	644	436	88	-	43	40	6
STP	Outlet	-	-	80	163	836	56	466	83	-	56.6	45	7.2
VIJAYAWADA CITY													
Ramalingeshwar	Inlet	7.0		144	404	980	160	-	-	-	-	-	-
Nagar	Outlet	7.6		124	376	780	160	-	-	-	-	-	-
Ajith Singh	Inlet	7.0		270	855	790	120	-	-	-	-	-	-
Nagar	Outlet	6.9		164	541	750	130	-	-	-	-	-	-
Auto Nagar	Inlet	6.4		132	397	1220	100	-	-	-	-	-	-
	Outlet	6.9		24	118	1080	60	-	-	-	-	-	-

domestic sewage and presently 62 MLD of sewage is being treated through four STPs. One more STP with a capacity of 32 MLD is under implementation. These STPs have been monitored by CPCB Zonal Office, Bangalore and the observations are as ahead :

- The pH varied from 6.4 to 7.0 at the inlet and 6.9 to 7.6 at the outlet, showing an increasing trend from acidic towards alkaline condition.
- The BOD level varied from 132 to 270 mg/l and 24 to 164 mg/l at inlet and outlet respectively and showed a reduction of upto 82 % at the outlet. Except at one STP, the values were found to be above the standards prescribed for discharge of environmental pollutants into inland surface waters or land application (irrigation).
- The COD values varied from 397 to 855 mg/l at inlet and from 118 to 541 mg/l at outlet showing a reduction of 7 to 71 %. The values were above the standard prescribed for discharge into inland surface water bodies (except at Auto Nagar STP).
- The TDS and TSS vales varied from 790 to 1220 mg/l and 100 to 160 mg/l respectively at the inlet and from 750 to 1080 mg/l and 60 to 160 mg/l at the outlet, with slight variation.

The total generation of the sewage in Rishikesh is 23 MLD out of which approximately 70% is treated.

6.4 Perfomance Monitoring of STPs at Uttarakhand

The population of Rishikesh area is about 14000. The total generation of the sewage is 23 MLD out of which approximately 70% of sewage is treated. The source of water is underground water and the total area sewered is approximately 70%. There are three STPs located in Uttarakhand, two are located in Rishikesh having capacity of 6.0 MLD (based on oxidation pond technology commissioned in 1990-91) and 0.32 MLD (based on anaerobic gravel media technology commissioned in 1986) respectively. These STPs are operated by Jal Nigam. The quantity of sludge produced is approximately 1500 cum.

The third STP of Uttarakhand is located at Haridwar and was commissioned in 1991. It is based on ASP technology having capacity of 18 MLD. The plant receives about 45 MLD effluent, out of which about 22 MLD is treated at the plant while the remaining is discharged directly into the river without any treatment. The source of water supply at Haridwar is groundwater. A total of about 80% area is sewered. The performance and operation and maintenance of the plant need improvement.

6.5 Sewage Treatment Plants and Sewage Management at Vrindavan, Mathura & Agra

During the year 2007, monitoring of all STPs created under YAP-I at Vrindavan, Mathura & Agra were taken for monitoring. It was derived from the study that

(i) area based inadequate treatment capacity, except at Dhandupura (Agra), where the plant was underused due to non-operation of MPS,
(ii) non-compliance of river discharge standard,
(iii) inadequate operation of the system and SPS and IPS at intercepting points and as a result, by-passing of untreated effluent at all locations.

Table 6.5 Sewage Treatment Plants and Sewage Management at Vrindavan, Mathura & Agra

Location of STP (Sewage Inflow, mld)	Capacity in mld (% treatment)	Average inlet quality mg/l				Average outlet quality from STP mg/l			
		pH	BOD	COD	SS	pH	BOD	COD	SS
				VRINDAVAN					
Kalidah (3.98)	0.5 (12.82)	7.56	190	489	245	7.79	67	198	71
Pagal Baba (8.33)	4.0 (48.02)	7.63	181	539	233	7.17	66	248	46
				MATHURA					
Laxmi Nagar (Not measured)	14.5	7.63	134	453	393	7.47	34	153	58
Masani (28.67)	14.0 (Actually treated 7.12, 24.83)	7.53	114	385	279	7.93	19	77	37
				AGRA					
Burhi-ki-Nagla (14.48)	2.25 (15.54)	7.66	100	292	158	7.26	50	171	66
Peelakhar (24.43)	10.0 (Actually treated 7.0, 28.65)	7.71	80	305	278	7.47	45	162	40
Dhandupura	78.0 (Actually treated 58.0, 74.36)	7.40	101	311	109	7.19	37	153	62

6.6 Performance Monitoring of Sewage Treatment Plant in Northern Region

The project for surveillance of raw sewage and treated effluent quality from sewage treatment plants installed along the stretch of river Ganga from Allahabad to Tarighat (Gazipur) has been undertaken by CPCB at the behest of NRCD, MoEF. Composite samples for round the clock operation had been collected on monthly basis from inlet and outlet of each unit to evaluate the performance of STPs. The performance of STPs monitored are presented as below.

Figure 6.6 Performance of Sewage Treatment Plant in Northern Region