

## Appendix B

### *Wastewater Treatment Technology Selection [Data Requirement]*

Cost for Secondary Treatment: (Source: Performance Evaluation of Sewage treatment plant under NRCD, CPCB, August, 2013).

	<b>Technology Name</b>	<b>ASP</b>	<b>MBBR</b>	<b>SBR</b>	<b>UASB</b>	<b>WSP</b>
	<b>Average capital cost, lacs/MLD up to sec. Treatment</b>	<b>68</b>	<b>68</b>	<b>75</b>	<b>68</b>	<b>23</b>
1	Yearly power cost, lacs/MLD up to sec. Treatment	4.04	4.87	3.34	2.13	0.1
2	Annual repairs cost, lacs/MLD up to sec. Treatment	1.5	1.22	1.16	1.56	1.11
3	Annual chemical cost, lacs/MLD up to sec. Treatment	0.85	0.85	0.85	0.85	0.60
4	Manpower cost, lacs/MLD for 50 mld plant up to sec. Treatment	33.7	24.77	20.74	33.7	25.63
5	Total annual O & M costs, lacs/MLD up to sec. Treatment	353.02	372.11	288.15	290.72	116.09
6	NPV (2010) of capital+ O & M cost for 15 years, lacs/MLD up to sec. Treatment	8695.3	8931.5	8072.2	7760.8	2891.3
7	Present (2010) treatment cost, paisa/L up to sec. Treatment	0.32	0.33	0.29	0.28	0.11

### Parameters Standard List for Reuse of Treated Wastewater

To the surface water (to be used for Drinking water) (Source: General Standards, Environmental Protection Rule, 1986 & Authorized by PCB).

Parameters	MOEF Standards (A)	Recommended Values
BOD, mg/L	30	Less than 10
SS, mg/L	100	Less than 10
TN, mg/L	100	Less than 10
Dissolved P, mg/L	5	Less than 2
Faecal Coliform, MPN/100 ml	Not Specified	Less than 230

### Treated Effluent Quality Standard (NRCD Guidelines, 2012)

Parameters	Discharge to water bodies	Discharge to land for agriculture
TSS, mg/L	50	100
BOD, mg/L	30	50
COD, mg/L	250	-
Faecal Coliform, MPN/100 ml	Desirable < 1000, Max <10000	<10000
pH value	5.5-9.0	5.5-9.0
Sulphides , ml	2.0	-
Total Coliform, ml	2.0	5.0

**Recommended norms of treated sewage quality specified activities at point of use (Source: CPHEEO, 2013)**

Sr. No.	Parameter	Toilet Flushing	Fire Protection	Vehicle Exterior Washing	Non-contact Impoundment	Horticulture & Agriculture			
						Horti, Golf Course	Non Edible Crops	Edible crops	
								Raw	Cook
1	Turbidity	<2	<2	<2	<2	<2	AA	<2	AA
2	SS	nil	nil	nil	nil	nil	30	nil	30
3	TDS		2100						
4	pH		6.5- 8.3						
5	Temp		Ambient						
6	Oil & Grease	10	nil	nil	nil	10	10	nil	nil
7	Minimum Residual Chlorine	1	1	1	0.5	1	nil	nil	nil
8	Total Kjeldahl Nitrogen	10	10	10	10	10	20	10	20
9	BOD	10	10	10	10	10	20	10	20
10	COD	AA	AA	AA	AA	AA	30	AA	30
11	Dissolved P	1	1	1	1	2	5	2	5
12	Nitrate N	10	10	10	5	10	10	10	10
13	Faecal Coliform	Nil	nil	nil	nil	nil	230	nil	230
14	Helminthic Egg / L	AA	AA	AA	AA	AA	<1	<1	<1
15	Colour	CL	CL	CL	CL	CL	AA	CL	CL

