

L-2

Water quality criteria and Effluent Standards



INDUSTRIAL WASTE TREATMENT

Water Quality Criteria



DESIGNATED BEST USE CLASSIFICATION OF SURFACE WATER

Water Quality Criteria

Designated-Best-Use	Class of water	Criteria
Drinking Water Source without conventional treatment but after disinfection	A	1.Total Coliforms OrganismMPN/100ml shall be 50 or less 2.pH between 6.5 and 8.5 3.Dissolved Oxygen 6mg/l or more 4.Biochemical Oxygen Demand 5 days 20°C 2 mg/l or less
Outdoor bathing (Organised)	B	1.Total Coliforms Organism MPN/100ml shall be 500 or less 2.pH between 6.5 and 8.5 3.Dissolved Oxygen 5mg/l or more 4.Biochemical Oxygen Demand 5 days 20°C 3 mg/l or less

Drinking water source after conventional treatment and disinfection	C	1.Total Coliforms Organism MPN/100ml shall be 5000 or less 2.pH between 6 to 9 3.Dissolved Oxygen 4 mg/l or more 4.Biochemical Oxygen Demand 5 days 20°C 3 mg/l or less
Propagation of Wild life and Fisheries	D	1.pH between 6.5 to 8.5 2.Dissolved Oxygen 4 mg/l or more 3.Free Ammonia (as N) 1.2 mg/l or less
Irrigation, Industrial Cooling, Controlled Waste disposal	E	1.pH betwwn 6.0 to 8.5 2.Electrical Conductivity at 25°C micro mhos/cm Max.2250 3.Sodium absorption Ratio (SAR) Max. 26 4.Boron Max. 2mg/l
	Below -E	Not Meeting A, B, C, D & E Criteria

Effluent standards





S.No.	Parameter	Standards for disposal of treated effluent in			
		Inland surface water	Public Sewer	Land for irrigation	Marine coastal areas
1.	2.	3.			
		(a)	(b)	(c)	(d)
1.	Colour and odour	See Note-1	---	See Note-1	See Note-1
2.	Suspended Solids, mg/l, Max	100	600	200	(a) For process waste water-100 (b) For cooling water effluent-10 per cent above total suspended matter of influent cooling water.
3.	Particle size of suspended solids	Shall pass 850 micron IS Sieve	---	---	(a) Floatable solids, Max 3 mm (b) Settleable solids Max 850 microns.



- **Note :-**

1. All efforts should be made to remove colour and unpleasant odour as far as practicable.
2. The standards mentioned in this notification shall apply to all the effluents discharged such as industrial mining and mineral processing activities municipal sewage etc.

4	Dissolved solids (inorganic), mg/a, mac	2100	2100	2100	---
5	pH value	5.5 to 9.0	5.5 to 9.0	5.5 to 9.0	5.5 to 9.0
6	Temperature °C, Max	Shall not exceed 40 in any section of the stream within 15 meters down stream from the effluent outlet	45 at the point of discharge	---	45 at the point of discharge
7	Oil and grease, mg/l, max	10	20	10	20
8	Total residual chlorine, mg/l, Max.	1.0	---	---	1.0


9.	Ammonical nitrogen (as N), mg/l, Max.	50	50	---	50
10.	Total Kjeldahl nitrogen (as N), mg/l, Max.	100	---	---	100
11.	Free Ammonia (as NH ₃), mg/l, Max.	5.0	---	---	5.0
12.	Biochemical Oxygen Demand (5 days at 20°C) Max.	30	350	100	100
13.	Chemical Oxygen Demand, mg/l, Max.	250	---	---	250
14.	Arsenic (as As), mg/l, Max.	0.2	0.2	0.2	0.2
15.	Mercury (as Hg), mg/l, Max.	0.01	0.01	---	0.01

16.	Lead (as Pb), mg/l, Max.	0.1	1.0	---	1.0
17.	Cadmium (as Cd), mg/l, Max.	2.0	1.0	---	2.0
18.	Hexavalent chromium (as Cr+6) mg/l, Max.	0.1	2.0	---	1.0
19.	Total chromium as (Cr), mg/l, Max.	2.0	2.0	---	2.0
20.	Copper (as Cu), mg/l, Max.	3.0	3.0	---	3.0
21.	Zinc (as Zn), mg/l, Max.	5.0	15	---	15
22.	Selenium (as Se), mg/l, Max.	0.05	0.05	---	0.05
23.	Nickel (as Ni), mg/l, Max.	3.0	3.0	---	5.0
24.	Boron (as B), mg/l, Max.	2.0	2.0	2.0	---
25.	Percent Sodium, Max.	---	60	60	---

26.	Residual sodium carbonate, mg/l, Max.	---	---	5.0	---
27.	Cyanide (as CN), mg/l, Max.	0.2	2.0	0.2	0.2
28.	Chloride (as Cl), mg/l, Max.	1000	1000	600	(a)
29.	Fluoride (as F), mg/l, Max.	2.0	15	---	15
30.	Dissolved Phosphates (as P), mg/l, Max.	5.0	---	---	---
31.	Sulphate (as SO ₄), mg/l, Max.	1000	1000	1000	---
32.	Sulphide (as S), mg/l, Max.	2.0	---	---	5.0
33.	Pesticides	Absent	Absent	Absent	Absent
34.	Phenolic compounds (as C ₆ H ₅ OH), mg/l, Max.	1.0	5.0	---	5.0
35.	Radioactive materials				
	(a) Alpha emitters MC/ml, Max.	10 ⁻⁷	10 ⁻⁷	10 ⁻⁸	10 ⁻⁷
	(b) Beta emitters uc/ml, Max.	10 ⁻⁶	10 ⁻⁶	10 ⁻⁷	10 ⁻⁶

Objective Questions

1. As per effluent standards, for disposal into the ocean pH value of treated effluent shall be _____.
2. As per designated best use classification of surface waters, for Drinking Water Source without conventional treatment but after disinfection, MPN shall be _____.
3. As per designated best use classification of surface waters, Propagation of Wild life and Fisheries, DO shall be _____.
4. As per designated best use classification of surface waters, Class E corresponds to water used for _____ purpose

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5. Standard for disposal of treated effluent in inland surface waters, for pH is _____.
 6. Standard for disposal of treated effluent in sewers, for BOD is _____.
 7. Standard for disposal of treated effluent in land for irrigation, for SS is _____.
- (similar objective questions can be asked on water quality criteria and effluent standards)

Theory questions



1. Explain Designated Best Use Classification of Surface water given by CPCB.
2. Give effluent standards for at least 10 pollutants.
3. Write Short note on effluent standards.