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SCHEDULE

PART II

Surface Water Quality Standards

PART III

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SCHEDULE.

PART I I

Surface Water Quality Standards

	Parameters	Unit of measurement	Standards for Categories		
			A1	A2	A3
1.	pH	pH Unit	5.5-8.5	5.5-9.0	5.5-9.0
2.	Colouration (after simple filtration)	mg/1 Pt scale	20 (o)	100 (o)	150 (o)
3.	Total suspended solids	mg/1 SS	50		
4.	Temperature	°C	25 (o)	25 (o)	25 (o)
5.	Conductivity	$\mu s/cm^{-1}$ at 20 °C	1000	1000	1000
6.	Odour	(dilution factor at 25°C)	5	10	20
7.*	Nitrates	mg/1 NO_3	50 (o)	50 (o)	50 (o)
8.	Fluorides	mg/1 F	1	1.7	1.7
9.*	Dissolved iron	mg/1 Fe	0.2	2	2
10.*	Manganese	mg/1 Mn	0.05	0.3	1
11.	Copper	mg/1 Cu	0.05 (o)	0.1 (o)	1 (o)
12.	Zinc	mg/1 Zn	3	5	5
13.	Boron	mg/1 B	2	2	2
14.	Arsenic	mg/1 As	0.05	0.05	0.1
15.	Cadmium	mg/1 Cd	0.005	0.005	0.005
16.	Total chromium	mg/1 Cr	0.05	0.05	0.05
17.	Lead	mg/1 Pb	0.05	0.05	0.05
18.	Selenium	mg/1 Se	0.01	0.01	0.01
19.	Mercury	mg/1 Hg	0.001	0.001	0.001
20.	Barium	mg/1 Ba	0.1	1	1
21.	Cyanide	mg/1 CN	0.05	0.05	0.05
22.	Sulphates	mg/1 SO_4	200	200 (o)	200 (o)
23.	Chlorides	mg/1 C1	250	250	250
24.	Surfactants (reacting with methylene blue)	mg/1 (laurylsulphate)	0.2	0.2	0.2
25.*	Phosphates	mg/1 P_2O_5	0.5	0.7	0.7
26.	Phenols (phenol index) paranitraniline 4-aminoantipyrine	mg/1 C_6H_5CH	0.0005	0.005	0.1
27.	Dissolved or emulsified hydrocarbons (after extraction by petroleum ether)	mg/1	0.01	0.2	1
28.	Polycyclic aromatic hydrocarbons	mg/1	0.0002	0.0002	0.001

	Parameters	Unit of measurement	Standards for Categories		
29.	Total pesticides (parathion, BHC, dieldrin)	mg/1	0.0005	0.0025	0.005
30.*	Chemical oxygen demand (COD)	mg/1 O_2			40
31.*	Dissolved oxygen saturation rate	% O_2	>60%	>50%	>30%
32.*	Biochemical oxygen demand (BOD_5) (at 20 °C without nitrification)	mg/1 O_2	5	5	7
33.	Nitrogen by Kjeldahl method (except in NO_2 and NO_3)	mg/1 N	1	2	3
34.	Ammonium	mg/1 NH_4	0.2	1.5	4 (o)
35.	Substances extractable with chloroform	mg/1 SEC	0.2	0.4	1
36.	Total coliforms 37°C	/100 ml	5,000	25,000	100,000
37.	Faecal coliforms	/100 ml	1,000	5,000	40,000
38.	Faecal streptococci	/100 ml	200	2,000	10,000
39.	Salmonella		Not present in 500 ml	Not present in 100 ml	

(o) = exceptional climatic or geographical conditions.
* = See article 5 (1) (*d*) [in respect of parameters marked with an asterisk in Part II of the Schedule in the case of surface water in shallow lakes or virtually stagnant surface water].

PART III

A. Table of Minimum Frequency of Sampling and Analyses

Population Served	Category of Surface Water								
	A1			A2			A3		
	Classification of Parameters								
	I	II	III	I	II	III	I	II	III
500	1/5	*	*	*	*	*	2	1	1
500 –1,000	1/5	*	*	1/3	*	*	2	1	1
1,000 – 5,000	¼	*	*	½	*	*	2	1	1
5,000–10,000	1/3	*	*	½	*	*	2	1	1
10,000–30,000	1	1	1/3	2	1	½	3	1	1
30,000-100,000	2	1	1/3	4	2	1	6	2	1
> 100,000	3	2	½	8	4	1	12	4	1

1/5 means once in 5 years.

2 means twice per annum.

*Frequency to be determined by the sanitary authority.

B. Table of Classification of Parameters according to Frequency

I		II		III	
Parameter		Parameter		Parameter	
1	pH	9	Dissolved iron	8	Fluorides
2	Colouration	10	Manganese	13	Boron
3	Total suspended solids	11	Copper	14	Arsenic
4	Temperature	12	Zinc	15	Cadmium
5	Conductivity	22	Sulphates	16	Total chromium
6	Odour	24	Surfactants	17	Lead
7	Nitrates	26	Phenols	18	Selenium
23	Chlorides	33	Nitrogen by Kjeldahl method	19	Mercury
25	Phosphates	36	Total coliforms	20	Barium
30	Chemical oxygen demand (COD)	37	Faecal coliforms	21	Cyanide
31	Dissolved oxygen saturation rate			27	Dissolved or emulsified hydrocarbons
32	Biochemical			28	Polycyclic aromatic

	oxygen demand (BOD_5)				hydrocarbons
34	Ammonium			29	Total pesticides
				35	Substances extractable with chloroform
				38	Faecal streptococci
				39	Salmonella

PART IV Methods of Analysis

	Parameter	Limit of Detection	Precision ±	Accuracy ±	Methods of Analysis
1	pH	—	0.1	0.2	—Electrometry. Measured in situ at the time of sampling without prior treatment of the sample.
2	Colouration (after simple filtration)	5	10%	20%	—Filtering through a glass fibre membrane. Photometric method using the plantinum-cobalt scale.
3	Total suspended solids	—	5%	10%	—Filtering through a 0.45 µm filter membrane, drying at 105°C and weighing. —Centrifuging (for at least 5 mins with mean acceleration of 2800 to 3200 g), drying at 105°C and weighing.
4	Temperature	—	0.5	1	—Thermometry. Measured in situ at the time of sampling without prior treatment of the sample.
5	Conductivity at 20°C	—	5%	10%	—Electrometry.
6	Odour	—	—	—	—By successive dilutions. (Glass container recommended.)
7	Nitrates	2	10%	20%	—Molecular absorption spectrophotometry.
8	Fluorides	0.05	10%	20%	—Molecular absorption spectrophotometry after distillation if necessary. —Ion selective electrodes.
9	Dissolved iron	0.02	10%	20%	—Atomic absorption spectrophotometry after filtering through a filter membrane (0.45 µm). —Molecular absorption spectrophotometry after filtering through 0.45 µm filter membrane.
10	Manganese	0.01	10%	20%	—Atomic absorption spectrophotometry.
		0.02[1]	10%	20%	—Atomic absorption spectrophotometry. —Molecular absorption spectrophotometry.
11	Copper[2]	0.005	10%	20%	—Atomic absorption spectrophotometry. —Polarography.
		0.02[3]	10%	20%	—Atomic absorption spectrophotometry. —Molecular absorption spectrophotometry. —Polarography.
12	Zinc[2]	0.02	10%	20%	—Atomic absorption spectrophotometry. —Molecular absorption spectrophotometry.
13	Boron[2]	0.1	10%	20%	—Molecular absorption spectrophotometry.

					—Atomic absorption spectrophotometry. (Materials for container not to contain boron in any significant quantities.)
14	Arsenic[2]	0.01			—Atomic absorption spectrophotometry. —Molecular absorption spectrophotometry.
15	Cadmium[2]	0.001	30%	30%	—Atomic absorption spectrophotometry. —Polarography.
16	Total chromium[2]	0.01	20%	30%	—Atomic absorption spectrophotometry. —Molecular absorption spectrophotometry.
17	Lead[2]	0.01	20%	30%	—Atomic absorption spectrophotometry. —Polarography.
18	Selenimum[2]	0.005			—Atomic absorption spectrophotometry.
19	Mercury[2]	0.002	30%	30%	—Flameless atomic absorption spectrophotometry (cold vaporization).
20	Barium[2]	0.02	15%	30%	—Atomic absorption spectrophotometry.
21	Cyanide	0.01	20%	30%	—Molecular absorption spectrophotometry.
22	Sulphates	10	10%	10%	—Gravimetric analysis. —EDTA complexiметry. —Molecular absorption spectrophotometry.
23	Chlorides	10	10%	10%	—Titration (Mohr's method). —Molecular absorption spectrophotometry.
24	Surfactants (reacting with methylene blue)	0.05	20%		—Molecular absorption spectrophotometry.
25	Phosphates	0.02	10%	20%	—Molecular absorption spectrophotometry.
26	Phenols (phenol index)	0.0005	0.0005	0.0005	—Molecular absorption spectrophotometry 4-aminoantipyrine method.
		0.001[1]	30%	50%	—Paranitraniline method. (Glass container recommended.)
27	Dissolved or emulsified hydrocarbons.	0.01	20%	30%	—Infra-red spectrometry after extraction by carbon tetrachloride.
		0.04[1]			—Gravimetry after extraction by petroleum ether. (Glass container recommended.)
28	Polycyclic aromatic hydrocarbonds[2]	0.00004	50%	50%	—Measurement of fluorescene in the UV after thin layer chromatography. Comparative measurement in relation to a mixture of six control substances with the same concentration[4]. (Glass or aluminium container recommended.)
29	Total pesticides (parathion, hexachlorocyclohexane, dieldrin)[2]	0.0001	50%	50%	—Gas or liquid chromatography after extraction by suitable solvents and purification. Identification of the constituents of the mixture. Quantitative analysis.[5] (Glass container recommended).
30	Chemical oxygen demand (COD)	15	20%	20%	—Potassium dichromate method.
31	Dissolved oxygen saturation rate	5	10%	10%	—Winkler's method. (Glass container recommended.) —Electrochemical method.
32	Biochemical oxygen	2	1.5	2	—Determination of dissolved oxygen before and after five-day incubation at 20°C ± 1°C,

	demand (BOD_5) at 20°C without nitrification				in complete darkness. —Addition of a nitrification inhibitor.
33	Nitrogen by Kjeldahl method (except in NO_2 and NO_3)	0.03	0.5	0.5	—Mineralization, distillation by Kjeldahl method and ammonium determination by means of molecular absorption spectrophotometry or titration.
34	Ammonium	0.1	10%	20%	—Molecular absorption spectrophotometry.
35	Substances extractable with chloroform				—Extraction at neutral pH value by purified chloroform, evaporation in vacuum at room temperature, weighing of residue.
36	Total coliforms	500			—Membrane filtration and culture at 37°C on an appropriate medium (such as Tergitol lactose agar, Endo agar, 0.4% Teepol broth) and colony count. —Samples must be diluted or, where appropriate, concentrated in such a way as to contain between 10 and 100 colonies. If necessary, identification by gasification.
		500			—Method of dilution with fermentation in liquid substrates in at least three tubes in three dilutions. Sub-culturing of the positive tubes on a confirmation medium. Count according to MPN (most probable number). Incubation temperature 37°C + 1°C. (Sterilized glass container recommended.)
37	Faecal coliforms	100			—Membrane filtration and culture at 44°C on an appropriate medium (such as Tergitol lactose agar, Endo agar, 0.4% Teepol broth) and colony count. Samples must be diluted or, where appropriate, concentrated in such a way as to contain between 10 and 100 colonies. If necessary, identification by gasification.
		100			—Method of dilution with fermentation in liquid substrates in at least three tubes in three dilutions. Subculturing of the positive tubes on a confirmation medium. Count according to MPN (most probable number). Incubation temperature 44°C ± 0.5°C. (Sterilized glass container recommended.)
38	Faecal streptococci	20			—Membrane filtration and culture at 37°C on an appropriate medium (such as sodium azide) and colony count. Samples must be diluted or, where appropriate, concentration in such a way as to contain between 10 and 100 colonies.
		20			—Method of dilution in sodium azide broth in at least three tubes with three dilutions. Count according to MPN (most probable number). (Sterilized glass container recommended.)
39	Salmonella	1/500ml			—Concentration by filtration (on membrane or appropriate filter).
		1/1000ml			—Innoculation into pre-enrichment medium. Enrichment and transfer into isolating gelese — Identification. (Sterilized glass container recommended.)

(1) For surface water of categories A2 and A3.

(2) If the samples contain so much suspended matter as to require special preliminary treatment, the accuracy values shown in this part of the Schedule may, as an exception, be exceeded and shall be regarded as a target. These samples shall be treated so as to ensure that the analysis covers the largest quantity of substances to be measured.

(3) For surface water of category A3.

(4) Mixture of six standard substances all of the same concentration to be taken into consideration: fluoranthene; 3, 4-benzofluoranthene; 11, 12-benzofluoranthene; 3, 4-benzopyrene; 1, 12-benzoperylene; indeno (1, 2, 3-cd) pyrene.

(5) Mixture of three substances all of the same concentration to be taken into consideration: parathion, hexachlorocyclohexane, dieldrin.