WATER RESOURCES ACT

(Cap.72:03)

(reg.80)

WATER RESOURCES REGULATIONS, 2018 **FORM I**

STANDARDS AND GUIDELINES FOR WATER QUALITY AND EFFLUENT DISCHARGE

(1) **Standards for domestic/sewage effluents discharged into inland surface waters**

Parameter	**Max Allowable (Limits)**
Arsenic as As (mg/1)	0.1
Biochemical Oxygen Demand (BOD 5 days at 20 °C) (mg/1)	20
Cadmium as Cd (mg/1)	1.0
Chemical Oxygen Demand (COD (mg/1)	60
Chromium as Cr (mg/1)	Less than 0.01
Lead as Pb (mg/1)	Less than 0.01
Oil and grease (mg/l)	2.5
pH (Hydrogen ion activity)	5.0-9.0
Phenols, total (mg/1)	0.05
Sulphide as S (mg/1)	2.0
Total Suspended Solids, (mg/1)	30
Temperature (in degrees Celsius) based on ambient temperature	± 5
Cyanides as CN (mg/1)	Less than 0.2
Nickel as Ni (mg/1)	Less than 2.0
Detergents (ABS) (mg/1)	Less than 5.0
Mercury as Hg (mg/1)	Less than 0.01
Total Phosphorus as P (mg/1)	2.0
Total Nitrogen as N (mg/l)	10
Total pesticide residues	Absent

(2) **Standards for Industrial effluents discharged into inland surface waters**

Parameter	Max Allowable (Limits)
Total Suspended Solids, mg/l	30
Particle size of Total Suspended Solids, mg/l	Shall not pass 850 micron
Total Dissolved Solids, mg/l	500
Total Residual Chlorine, mg/l	1.0
pH value	6.5-9.0

Temperature (in any section of the receiving water body within 15 metres downstream from the effluent outlet) ^{0}C	40
Biochemical Oxygen Demand for 5 days (BOD_5) at 20 ^{0}C, mg/l	20
Chemical Oxygen Demand (COD), mg/l	60
Oils and grease and other liquids immiscible with water, mg/l	2.5
Colour, TCU	25
Turbidity, NTU	25
Effluent volume/day, m^3	5.0
Radioactivie materials (Bq/l): Alpha emitters, Beta emitters	 3.7 Bq/l 37 Bq/l
Insectcides Organochloride, mg/l Organophosphates, mg/l	 0.10 0.20
Carbonates, mg/l	0.50
Ammonia Nitrogen, mg/l	10
Sulphates, mg/l	800
Nitrates, mg/l	50
Nitrites, mg/l	1.0
Cyanides (as CN), mg/l	0.05
Sulphides (as S), mg/l	2.0
Fluorides, mg/l	2.0
Arsenic, mg/l	0.05
Cadmium, mg/l	0.01
Total Chromium, mg/l	0.05
Bromides, mg/l	8.0
Copper, mg/l	2.0
Lead, mg/l	0.05
Mercury, mg/l	Nil
Nickel, mg/l	0.01
Selenium, mg/l	Nil
Zinc, mg/l	5.0
Phosphates, mg/l	0.15
Inorganic compounds, mg/l	0.01

(3) Standards for Drinking Water Delivered from Boreholes and Protected Shallow Wells

Parameter	Max Allowable (Limits)
Chemical requirements	
Aluminium as Al, mg/l	0.50
Arsenic as AS, mg/l	0.05
Barium as Ba, mg/l	0.70
Cadmium as Cd, mg/l	0.01
Chromium as Cr, mg/l	0.01
Cyanide as Cn, mg/l	0.07
Copper as Cu, mg/l	2.0
Fluoride as F, mg/l	6.0
Iron as Fe, mg/l	3.0
Lead as Pb, mg/l	0.05
Manganese as Mn, mg/l	1.5
Nitrate, NO_3, mg/l	45
Sulphate as SO_4^2, mg/l	800

Zinc as Zn, mg/l	15
Uranium, mg/l	0.03
Physical and Micro Constituent Characteristics	
Colour, TCU	50
Turbidity, NTU	25
Electrical Conductivity, µs/cm at 20^0C	3,500
pH Value	6.0-9.5
Calcium, mg/l	250
Total Hardness as $CaCO_3$, mg/l	800
Chloride, mg/l	750
Magnesium, mg/l	200
Sodium, mg/l	500
Total Dissolved Solids, mg/l	2000
Microbiological Characteristics	
Total coliform, count/100ml	50
Faecal (Thermotolerant) coliforms, count/100ml	50
Faecal streptococci, Count/100ml	0
Colony counts, Count/ml at 22^0C	100

(4a) Standards for Treated Drinking Water

Parameter	Max Allowable (Limits)
Physical and organoleptic requirements	
Colour, mg/l	5-10
Electrical Conductivity at 25^0C, ms/m	70-150
Total Dissolved Solids, mg/l	450-1000
Odour, TON	1-5 or (odourless)
pH value at 25^0C	5.0-9.5
Turbidity, NTU	0.10-1.0
Chemical requirements of micro-determinants	
Ammonia as N, mg/l	0.20-1.0
Calcium as Ca, mg/l	80-150
Chloride as Cl, mg/l	100-200
Fluoride as F, mg/l	0.70-1.0
Magnesiun as Mg, mg/l	30-70
Potassium as K, mg/l	25-50
Sodium as Na, mg/l	100-200
Sulphate as SO_4^{2-}, mg/l	200-400
Zinc as Zn, mg/l	3.0-5.0
Chemical requirements of micro-determinants	
Aluminium as Al, µg/l	150-300
Arsenic as As, µg/l	10-50
Cadmiun as Cd, µg/l	3-5
Chromium as Cr, µg/l	50-100
Cobalt as Co, µg/l	250-500
Copper as Cu, µg/l	500-1000
Cyanide as CN, µg/l	30-50
Iron as Fe, µg/l	10-200
Lead as Pb, µg/l	10-50
Manganese as Mn, µg/l	50-100
Mercury as Hg, µg/l	1-2
Selenium as Se, µg/l	10-20
Uranium, mg/l	0.03
Chemical requirements- organic determinants	
Total Trihalomethanes, µg/l*	100-200
Phenols, µg/l	5-10

a) The limits given are based on aesthetic aspects
b) No primary health effect – low pH values can result in structural problems in the distribution
* This is a suggested value because trihalomethanes have not been proven to have any effect on human health

(4b) Standards for Treated Drinking Water- Microbiological requirements

1	2	3	4	5
		Allowable compliance contribution		
Determinants	Units	95% of sample min	4% of sample max	1% of sample max
		Upper limits		
Total coliform	Count/100ml	Not detected	10	100
Faecal coliform[b]	Count/100ml	Not detected	1	10
E.coli[b]	Count/100ml	Not detected	Not detected	1

a) The allowable compliance contribution shall be at least 95% to the limits indicated in column 3 with a maximum of 4% and 1%, respectively, to the limits indicated in column 4 and column 5. The objective of disinfection should, nevertheless, be to attain 100% compliance to the limits indicated in column 3.
b) In most instances it will not be necessary to conduct both these tests; one or the other will normally suffice as the required indicator

(4c) Standards for Treated Drinking Water- Minimum frequency of sampling-Microbiological Test

Population Served	**Frequency min**
More than 1,000,000	10 every month
25,001-1,1,000,000	10 every month
10,001-25,000	3 every month
2,500-10,000	2 every month
Less than 2,500	1 every month

(4d) Guidelines for Irrigation Water

Water Class	**SAR**	**EC** (µS/cm)	**TDS** (Gravimetric ppm)	**Boron,** mg/l		
				Sensitive Crops	**Semitolerant Crops**	**Tolerant Crops**
Class 1, Excellent	1-10	<250	175	<0.33	<0.67	<1.00
Class 2, Good	10-18	250-750	175-525	0.33-0.67	0.67-1.33	1.00-2.00
Class 3, Permissible	18-26	750-2000	525-1400	0.67-1.00	1.33-2.00	2.00-3.00
Class 4, Doubtful	>26	2000-3000	1400-2001	1.00-1.25	2.00-2.50	3.00-3.75
Class 5, Unsuitable	>26	>3000	>2001	>1.25	>2.50	>3.75

(4e) Guidelines for Recreational Water Quality -

Parameter	**Guideline**
Total coliform bacteria	<500/100 ml
Escherichia coliform	<200/100 ml
Enterococci	<35/ 100 ml
pH	5.0 - 9.0
Arsenic	0.05mg/L
Cadmium	0.01mg/L
Chromium	0.1mg/L
Radiation, Total	0.37Bq/L
Turbidity	50 NTU
Clarity (light penetration)	Secchi disc visible at a depth of 1.2M
Colour	100 (true colour units
Oil/grease	5.0 mg/L
Odour (Threshold Odour Number)	16