



# WATER QUALITY STANDARDS, 2018

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## **1. Introduction**

The National Environment Protection Act, 2007 mandates the National Environment Commission Secretariat (NECS) to maintain a National environmental information system for the purpose of gathering, processing, analyzing, and disseminating data on the state of the environment. Further, the Water Act of Bhutan 2011 mandates the NECS to monitor the state of water resources, and compile, analyze and disseminate information thereon by obtaining data from the Competent Authorities.

The National Environment Commission (NEC) issued the Environmental Standards 2010 as per Section 30(f) of the National Environment Protection Act (NEPA), 2007, which provides ambient water quality criteria, industrial effluent discharge standards, and standards for sewerage effluents.. However, the standard do not provide clear roles and responsibilities, monitoring and reporting system of the designated/Competent Authorities. The amendment aims to provide, clear roles and responsibilities of the designated/Competent authorities (CAs) in monitoring the water quality and data reporting system to the National Environment Commission. The amendment will not change the existing table of parameters and its limits. The NEC approved the amendments during its 47<sup>th</sup> NEC meeting held on 26<sup>th</sup> July, 2018.

## **2. Normative reference**

This edition is in accordance with Section 82, 83, 84, 85 of the NEPA, 2007 and Section 13 (e), (f), (g), (i) and 42 of The Water Act of Bhutan 2011.

## **3. Scope**

To facilitate effective enforcement of the following standards:

- i. The Ambient Water Quality;
- ii. Industrial Effluent Discharges; and
- iii. Sewerage Treatment Plant.

## **4. Objective**

To establish a systematic monitoring and reporting mechanism in order to maintain a centralized data on water quality through delineation of clear roles and responsibilities to the relevant CAs.

## **5. Roles and responsibilities of the National Environment Commission Secretariat**

- Monitor state of water resources, and compile, analyse and disseminate information.
- Obtain any data on water volumes, flows and quality from the CAs.
- Recognize/designate water quality monitoring sites in consultation with relevant stakeholders.
- Conduct verification monitoring, as and when considered necessary.
- Conduct investigative monitoring in case of deterioration of the water quality.

- Ensure that effluent discharges are within the prescribed standards.
- May require the relevant CAs to conduct monitoring for non-listed projects.
- Promote network among all relevant agencies for sharing and carrying out water quality monitoring.
- Monitoring maybe conducted through collaboration or through a directive to the relevant CAs.

## 6. Ambient water quality

### 6.1 Table of Parameters

S/N	Parameters	A	B	C
1	pH	6.5-8.5	6-9	6-9
2	Color, Hz Units	5	50	-
3	Total Suspended Solids mg/l	25	100	-
4	Conductivity, $\mu$ S/cm	800	1000	2000
5	Odor	Unobjectionable	Unobjectionable	-
6	Mineral oil	No film	No film	-
7	Nitrate, mg/l	10	50	-
8	Fluoride, mg/l	1.0	2.0	-
9	Sulphates, mg/l	25	100	-
10	Chloride, mg/l	50	200	-
11	Surfactants, mg/l	0.1	0.2	-
12	Phosphates, mg/l	0.5	<1.0	-
13	Dissolved Oxygen, mg/l	6	4	-
14	Biochemical Oxygen Demand, mg/l	2	5	50
15	Total Kjeldahl Nitrogen, mg/l	0.5	2	-
16	Ammonia, mg/l	0.05	0.5	-
17	T.coliform, MPN/100 ml	50	5000	10000
18	F.coliform, MPN/100ml	20	2000	5000
19	F. Streptococci, MPN/100 ml	20	1000	1000
20	Dissolved iron, mg/l	0.2	0.5	-
21	Copper, mg/l	0.05	0.1	-
22	Zinc, mg/l	0.2	0.5	-
23	Arsenic, mg/l	0.01	0.05	-
24	Cadmium, mg/l	0.003	0.003	-
25	Total- Chromium, mg/l	0.05	0.05	-
26	Lead, mg/l	0.02	0.02	-
27	Selenium, mg/l	0.01	0.01	-
28	Mercury, mg/l	0.0005	0.0005	-
29	Phenols, mg/l	0.001	0.002	-
30	Cyanides, mg/l	0.05	0.05	-

31	Poly Aromatic Hydrocarbon, mg/l	0.0002	0.0002	0.001
32	Total Pesticides, mg/l	0.0005	0.0005	0.001
33	Poly Chlorinated Biphenyle, mg/l	0.0002	0.0002	-
34	Sodium Absorption Ratio	-	-	26
35	Boron	-	-	1
36	Floating materials such as wood, plastic, rubber, excreta, garbage, etc	Absent	Absent	-

**Note:**

**Class A: (Very Good)**

Drinking water source without conventional treatment, but after disinfection whenever necessary.

**Class B: (Good)**

Drinking water source with conventional treatment.

**Class C: (Moderate)**

Uses for irrigation, industrial cooling, etc.

## 6.2 Roles and responsibilities of the National Center for Hydrology & Meteorology

- Conduct ambient water quality monitoring (WQM) of rivers and streams along with other hydrological observations in all the hydrological stations operated by NCHM.
- Install additional water quality monitoring stations/sites in consultation with the NECS.
- Provide technical support to the NECS/other agencies in WQM monitoring and related works.
- Collect, process and maintain water quality database for record/archival.
- Prepare and submit to the NECS, an annual Water Quality Report covering status and trends in water quality of rivers and streams.

## 7. Industrial Effluent discharges

### 7.1 Table of Parameters

S/N	Parameters (unit)	Generic	Specific Standards (Maximum permissible limit)				
			Food	Mining	Metals Ind (Electric arc furnace)	Chemicals(T extile and carpet)	Wood
1	Ammoniacal nitrogen (NH <sub>3</sub> -N)	10	10			8	8
2	Arsenic (AS)	0.1		0.1	0.1		
3	Biochemical Oxygen Demand (BOD <sub>5</sub> )	30.0	30	30	30	30	100
4	Boron (B)	1.0					
5	Cadmium total (Cd)	0.05					
6	Chemical Oxygen Demand	150	150				200
7	Chloride (Cl)	500					
8	Chromium total (Cr)	0.5					
9	Chromium Hexavalent (Cr <sup>+6</sup> )	0.1					
10	Color and Odor	*					
11	Copper total (Cu)	0.1		0.5	0.5		
12	Cyanide (CN)	0.1					
13	Fluoride (F)	2.0					
14	Phosphate (PO <sub>4</sub> )	3.0					
15	Nitrate (NO <sub>3</sub> )	10.0					
16	Iron total	2.0					
17	Lead total (Pb)	0.1		0.1	0.1		
18	Manganese (Mn)	0.5					
19	Mercury (Hg)	0.001		0.001	0.001		
20	Nickel (Ni)	0.1		0.5	0.5		
21	Oil and grease	5.0					
22	pH	6.5-8.5					
23	Phenolic compounds (as C <sub>6</sub> H <sub>5</sub> OH)	0.5				0.5	0.5
24	Selenium (Se)	0.05					
25	Sulphate (SO <sub>4</sub> )	500					
26	Sulphide (S)	1.0				0.2	
27	Total Dissolved Solids (TDS)	1500					

28	Total Suspended Solids (TSS)	<b>80</b>	80	50.0	50.0		
29	Temperature, degree c	< <b>3</b> **					
30	Total Kjeldahl Nitrogen (N)	<b>20</b>					
31	Total residual chlorine	<b>0.5</b>					
32	Zinc total (Zn)	<b>3.0</b>		2.0	2.0		

*Note: The generic standard will apply unless otherwise stated. All units in mg/L unless otherwise stated.*

\*For color and odor, it is recommended that, as far as practicable, color and unpleasant odor should be absent in the samples.

\*\* Temperature of the receiving water bodies shall not exceed 3 degrees Celsius from the ambient in any section of the streams within 15 m downstream from the point of effluent discharge.

## **7.2 Roles & responsibilities of the Environment Unit, Department of Industries, Ministry of Economic Affairs.**

- Conduct monitoring for listed projects.
- Ensure effluent discharge standards are complied by the industries.
- Assist the NECS in conducting effluent discharge monitoring as and when necessary.
- Submit quarterly report to the NECS.

## **8. Sewerage Treatment Plant**

### **8.1. Table of parameters for final effluent from STP**

<b>S/N</b>	<b>Parameters (Unit)</b>	<b>Concentration not to exceed</b>
1	BOD (mg/L)	30
2	TSS (mg/L)	100
3	Fecal Coliform (MPN/100ml)	1000

### **8.2 Roles & responsibilities of Thromdes/Municipalities**

- Conduct monitoring of effluent discharged from the STPs.
- Ensure that effluent discharges are within the prescribed standards.
- Ensure that effluent discharges from residential areas are connected to sewer systems.
- Submit quarterly report to the NECS.

## **9. Data reporting system**

The following is the data reporting system:

- The NCHM shall submit data on ambient water quality to NECS annually.
- The Environment Unit of the Department of Industries shall submit data on effluent discharges from industries to NECS quarterly.
- The Thromdes/municipalities shall submit data on STP discharges to NECS quarterly.
- In addition, the NECS may also obtain water quality data from any other agency dealing/collecting information on water quality.
- The NECS shall establish and maintain a centralized data system on water quality.
- The NECS will prepare annual water quality report and submit to the NEC.

## **References**

1. The Environment Assessment Act, 2000.
2. The National Environment Protection Act, 2007.
3. The Waste Prevention and Management Act, 2009.
4. Environmental Standards, 2010.
5. The Water Act of Bhutan, 2011.
6. The Waste Prevention and Management Regulation, 2012.
7. The Water Regulation of Bhutan, 2014.
8. The Environment Assessment Regulation, 2016.