

# APPENDIX E

Department of  
Environment and Natural  
Resources  
Water Quality Criteria

SUBJECT : REVISED WATER USAGE AND CLASSIFICATION/WATER QUALITY CRITERIA  
AMENDING SECTION NOS. 68 AND 69, CHAPTER III OF THE 1978 NPCC RULES  
AND REGULATIONS

Section 68. Water Usage and Classification

The quality of Philippine waters shall be maintained in a safe and satisfactory condition according to their best usages. For this purpose all waters shall be classified according to the following beneficial usages:

(a) Fresh Surface Waters (rivers, lakes, reservoirs, etc.)

<u>Classification</u>	<u>Beneficial Use</u>
Class AA	Public Water Supply Class I. This class is intended primarily for waters having watersheds which are uninhabited and otherwise protected and which require only approved disinfection in order to meet the National Standards for Drinking Water (NSDW) of the Philippines.
Class A	Public Water Supply Class II. For sources of water supply that will require complete treatment (coagulation, sedimentation, filtration and disinfection) in order to meet the NSDW.
Class B	Recreational Water Class I. For primary contact recreation such as bathing, swimming, skin diving, etc. (particularly those designated for tourism purposes).
Class C	1) Fishery Water for the propagation and growth of fish and other aquatic resources; 2) Recreational Water Class II (Boating, etc.) 3) Industrial Water Supply Class I (For manufacturing processes after treatment).
Class D	1) For agriculture, irrigation, livestock watering, etc. 2) Industrial Water Supply Class II (e.g. cooling, etc.) 3) Other inland waters, by their quality, belong to this classification.

(b) Coastal and Marine Waters

<u>Classification</u>	<u>Beneficial Use</u>
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In general, this refers to current best beneficial use that is expected to last, at least, for the next 10 to 20 years. In special cases when dictated by political, economic, social, public health, environmental and other considerations, certain waters may be classified according to the intended or future beneficial use (e.g. Pasig River, Tullahan-Tenejeros, etc.)



Class SA

- 1) Waters suitable for the propagation, survival and harvesting of shellfish for commercial purposes;
- 2) Tourist zones and national marine parks and reserves established under Presidential Proclamation No. 1801; existing laws and/or declared as such by appropriate government agency.
- 3) Coral reef parks and reserves designated by law and concerned authorities.

Class SB

- 1) Recreational Water Class I (Areas regularly used by the public for bathing, swimming, skin diving, etc.)
- 2) Fishery Water Class I (Spawning areas for Chanos chanos or "Bangus" and similar species).

Class SC

- 1) Recreational Water Class II (e.g. boating, etc);
- 2) Fishery Water Class II (Commercial and sustenance fishing);
- 3) Marshy and/or mangrove areas declared as fish and wildlife sanctuaries;

Class SD

- 1) Industrial Water Supply Class II (e.g. cooling, etc.);
- 2) Other coastal and marine waters, by their quality, belong to this classification.

(c) General Provisions on Water Classification

1. Classification of a water body according to a particular designated use or uses does not preclude use of the water for other purposes that are lower in classification provided that such use does not prejudice the quality required for such waters.
2. Water classifications are arranged in the order of the degree of protection required, with Class AA and SA having generally the most stringent water quality, respectively, for fresh surface waters and marine/coastal waters; and Class D and SD waters have the least stringent water quality for fresh surface waters and marine waters, respectively.
3. The main objective of the water quality criteria is to maintain the minimum conditions necessary to assure the suitability of water for its designated use or classification.
4. Any person regulated under these rules or having a substantial interest in this chapter may reclassification of waters by filing a petition with the DENR giving all necessary information to support the petition.
5. All reclassification of water shall be adopted, only after public notice and hearing and upon affirmative findings by the DENR Regional Office concerned that:

- i) The proposed reclassification will establish the present and future most beneficial use of the waters;
  - ii) Such a reclassification is clearly in the public interest, and
  - iii) The proposed designated use is attainable, upon consideration of environmental, technological, social, economic and institutional factors.
6. For purposes of classification or reclassification the following minimum water quality parameters are to be considered:
- i) Dissolved Oxygen (DO)
  - ii) pH
  - iii) Biochemical Oxygen Demand (BOD)
  - iv) Total Coliform Organisms

Section 69. Water Quality Criteria

(a) Minimum Criteria for Surface Waters. All surface waters of the country shall be free from:

1. Domestic, industrial, agricultural, or other man-induced non-thermal components of discharges which, alone or in combination with other substances or in combination with other components of discharges (whether thermal or non-thermal):
  - i) That settle to form putrescent deposits or otherwise create a nuisance; or
  - ii) That float as debris, scum, oil, or other matter in such amounts as to form nuisances; or
  - iii) That produce color, odor, taste, turbidity, or other conditions in such degree as to create a nuisance; or
  - iv) That are acutely toxic; or
  - v) That are present in concentrations which are carcinogenic, mutagenic, or teratogenic to human beings or to significant, locally occurring, wildlife or aquatic species; or
  - vi) That pose a serious danger to the public health, safety, or welfare.
2. Thermal components of discharges which alone, or in combination with other discharges or components of discharges (whether thermal or non-thermal):
  - i) That produce conditions so as to create nuisance; or
  - ii) That increase the temperature of the receiving body of water (RBW) so as to cause substantial damage or harm to the aquatic life, or vegetation therein or interfere with the beneficial uses assigned to the RBW.



(b)

Water Quality Criteria for Fresh Waters

1. Conventional and Other Pollutants Affecting Aesthetics and Oxygen Demand. - Please refer to Table 1 for the parameters and limits or specifications according to classification and use of the receiving body of water (RBW).
2. Toxic and Other Deleterious Substances

The maximum limits for these types of pollutants according to classification or use of the receiving body of water are found in Table 2.

TABLE 1 - WATER QUALITY CRITERIA FOR CONVENTIONAL AND OTHER POLLUTANTS CONTRIBUTING TO ALSTHETICS AND OXYGEN DEMAND FOR FRESH WATERS <sup>(a)</sup>

PARAMETER	UNIT	CLASS AA	CLASS A	CLASS B	CLASS C	CLASS D <sup>(c)</sup>
Color	PCU	15	50	(c)	(c)	(c)
Temperature <sup>(d)</sup> (max. rise in degree Celsius) — °C rise		3	3	3	3	3
pH (range)		6.5-8.5	6.5-8.5	6.5-8.5	6.5-8.5	6.0-9.0
Dissolved Oxygen <sup>(e)</sup> (Minimum)	% satn 70 mg/L	70	70	60	40	3.0
5-Day 20°C BOD	mg/L	1	5	5	7(10)	10(15)
Total Suspended Solids	mg/L	25	50	(f) 50 (g) 100 (h) 200	1,000 <sup>(g)</sup>	1,000 <sup>(h)</sup>
Total Dissolved Solids	mg/L	500 <sup>(i)</sup>	1,000 <sup>(i)</sup>	0.3(0.5)	0.5	--
Surfactant (MBAS)	mg/L	nil	0.2(0.5)	1	2	5
Oil/Grease (Petroleum Ether Extract)	mg/L	nil	1	nr	10 <sup>(j)</sup>	--
Nitrate as Nitrogen	mg/L	1.0	10	0.2 <sup>(k)</sup>	0.4 <sup>(k)</sup>	--
Phosphate as Phosphorus	mg/L	nil	0.1 <sup>(l)</sup>			



TABLE 1 CONTINUED

PARAMETER	UNIT	CLASS AA	CLASS A	CLASS B	CLASS C	CLASS D
Phenolic Substances as Phenols	mg/L	nil	0.002	0.005 <sup>(m)</sup>	0.02 <sup>(m)</sup>	--
Total Coliform or Fecal Coliform	MPN/100ml	50 <sup>(m)</sup>	1,000 <sup>(m)</sup>	1,000 <sup>(m)</sup>	5,000 <sup>(m)</sup>	--
Chloride as Cl	MPN/100ml	20 <sup>(m)</sup>	100 <sup>(m)</sup>	200 <sup>(m)</sup>	--	--
	mg/L	250	250	--	350	--
Copper	mg/L	1.0	1.0	--	0.05 <sup>(a)</sup>	--

## Footnotes for Tables 1, 2, 3 and 4

- (a) - Except as otherwise indicated, the numerical limits in Tables 1 and 3 are yearly average values. Values enclosed in parentheses are maximum values.
- (b) - For irrigation purposes, SAR should have a minimum value of 8 and a maximum value not to exceed 19. Boron should not exceed 0.75 mg/l.
- (c) - No abnormal discoloration from unnatural causes.
- (d) - The allowable temperature increase over the average ambient temperature for each month. This rise shall be based on the average of the maximum daily temperature readings recorded at the site but upstream of the mixing zone over a period of one (1) month.
- (e) - Sampling taken between 9:00 AM and 4:00 PM.
- (f) - Not more than 30% increase.
- (g) - Not more than 30 mg/l increase.
- (h) - Not more than 60 mg/l increase.
- (i) - Do not apply if natural background is higher in concentration. The latter will prevail and will be used as baseline.

- (j) - Applicable only to lakes, reservoirs, and similarly impounded water.
- (k) - When applied to lakes or reservoirs, the Phosphate as P concentration should not exceed an average of 0.05 mg/l nor a maximum of 0.1 mg/l.
- (l) - Not present in concentrations to affect fish flavor/taste.
- (m) - These values refer to the geometric mean of the most probable number of coliform organism during a 3-month period and that the limit indicated shall not be exceeded in 20 percent of the samples taken during the same period.
- (n) - For spawning areas for Chanos chanos and other similar species.
- (o) - Limit is in terms of dissolved copper.
- nil - Extremely low concentration and not detectable by existing equipment.
- - Means the standard of these substances are not considered necessary for the present time, considering the stage of the country's development and DENR capabilities, equipment and resources.
- nr - Means No Recommendation made.



TABLE 2 - WATER QUALITY CRITERIA FOR TOXIC AND OTHER DELETERIOUS SUBSTANCES FOR FRESH WATERS (For the Protection of Public Health)

PARAMETER	UNIT	CLASS AA	CLASS A	CLASS B	CLASS C	CLASS D
Arsenic <sup>(1)</sup>	mg/L	0.05	0.05	0.05	0.05	0.1
Cadmium <sup>(1)</sup>	mg/L	0.01	0.01	0.01	0.01	0.05
Chromium <sup>(1)</sup> (Hexavalent)	mg/L	0.05	0.05	0.05	0.05	0.1
Cyanide	mg/L	0.05	0.05	0.05	0.05	--
Lead <sup>(1)</sup>	mg/L	0.05	0.05	0.05	0.05	0.5
Total Mercury <sup>(1)</sup>	mg/L	0.002	0.002	0.002	0.002	0.002
Organophosphate	mg/L	nil	nil	nil	nil	nil
Aldrin	mg/L	0.001	0.001	--	--	--
DDT	mg/L	0.05	0.05	--	--	--
Dieldrin	mg/L	0.001	0.001	--	--	--
Heptachlor	mg/L	nil	nil	--	--	--
Lindane	mg/L	0.004	0.004	--	--	--
Toxaphane	mg/L	0.005	0.005	--	--	--
Methoxychlor	mg/L	0.10	0.10	--	--	--

TABLE 2 CONTINUED

PARAMETER	UNIT	CLASS AA	CLASS A	CLASS B	CLASS C	CLASS D
Chlordane	mg/L	0.003	0.003	--	--	--
Endrin	mg/L	nil	nil	--	--	--
PCB	mg/L	0.001	0.001	--	--	--

Note: 1. Limiting values of organophosphates and organochlorines may in the meantime serve as guidelines in the interim period pending the procurement and availability of necessary laboratory equipment. For Barium, Cobalt, Fluoride, Iron, Lithium, Manganese, Nickel, Selenium, Silver and Vanadium, the 1978 NPCC Rules and Regulations, Section 69 may be considered.

2. For footnotes refer to Table 1.



(c) Coastal and Marine Waters Criteria.

1. Conventional and Other Pollutants Affecting Aesthetics and Oxygen Demand. The criteria for Class SA, SB, SC and SD are found in Table 3.

TABLE 3. WATER QUALITY CRITERIA FOR CONVENTIONAL AND OTHER POLLUTANTS AFFECTING AESTHETICS AND EXERTING OXYGEN DEMAND FOR COASTAL AND MARINE WATERS. <sup>(A)</sup>

PARAMETER	UNIT	CLASS SA	CLASS SB	CLASS SC	CLASS SD
Color	PCU	(C)	(C)	(C)	(C)
Temperature <sup>(B)</sup> (max. rise in deg. Celsius)	°C rise	3	3	3	3
pH (range)		6.5-8.5	6.0-8.5	6.0-8.5	6.0-8.0
Dissolved Oxygen <sup>(B)</sup> (Minimum)	% satn	70	70	70	50
5 Day 20°C BOD	mg/L	5.0	5.0	5.0	2.0
Total Suspended Solids	mg/L	3	5	7(10)	--
Surfactant (MBAS)	mg/L	(F)	(G)	(G)	(H)
Oil/Grease (Petroleum Ether Extract)	mg/L	0.2	0.3	0.5	--
Phenolic Substances as Phenols	mg/L	1	2	3	5
Total Coliform	MPN/100 mL	nil	0.01	(L)	--
Fecal Coliform	MPN/100 mL	70 <sup>(M)</sup>	1,000 <sup>(M)</sup>	1,000 <sup>(M)</sup>	--
Copper	mg/L	nil	200 <sup>(M)</sup>	--	--
		--	0.2 <sup>(N) (O)</sup>	0.05 <sup>(O)</sup>	--

NOTE: For footnotes please refer to Table 1.

2. Toxic and Other Deleterious Substances. The maximum limits for toxic and other deleterious substances for waters classified as Class SA, SB, SC and SD waters are found in Table 4.

TABLE 4. WATER QUALITY CRITERIA FOR TOXIC AND OTHER DELETERIOUS SUBSTANCES FOR COASTAL AND MARINE WATERS (For the Protection of Public Health)

PARAMETER	UNIT	CLASS SA	CLASS SB	CLASS SC	CLASS SD
Arsenic <sup>(Q)</sup>	mg/L	0.05	0.05	0.05	--
Cadmium <sup>(Q)</sup>	mg/L	0.01	0.01	0.01	--
Chromium <sup>(Q)</sup> (hexavalent)	mg/L	0.05	0.1	0.1	--
Cyanide	mg/L	0.05	0.05	0.05	--
Lead <sup>(Q)</sup>	mg/L	0.05	0.05	0.05	--
Total Mercury <sup>(Q)</sup>	mg/L	0.05	0.05	0.05	--
Organophosphate	mg/L	0.002	0.002	0.002	--
Aldrin	mg/L	nil	nil	nil	--
	mg/L	0.001	--	--	--

DDT	mg/l	0.05	--	--	--
Dieldrin	mg/l	0.001	--	--	--
γ-hexachlorocyclopentadiene	mg/l	nil	--	--	--
Lindane	mg/l	0.004	--	--	--
Toxaphene	mg/l	0.005	--	--	--
Methoxychlor	mg/l	0.10	--	--	--
Chlordane	mg/l	0.003	--	--	--
Endrin	mg/l	nil	--	--	--
PCB	mg/l	0.001	--	--	--

- Note: 1. Limiting values of organophosphates and organochlorines may in the meantime serve as guidelines in the interim period pending the procurement and availability of necessary laboratory equipment. For Barium, Cobalt, Fluoride, Iron, Lithium, Manganese, Nickel, Selenium, Silver and Vanadium, the 1978 NPCC Rules and Regulations, Section 69 may be considered.
2. For footnotes please refer to Table 1.

(d) Methods of Analysis. - For purposes of these regulations, any water sample taken for the purpose of classification or for determining compliance with the water quality criteria shall be analyzed in accordance with the methods enumerated in Table 5. The table also applies to determine compliance to effluent regulations.

TABLE 5. APPROVED METHODS OF ANALYSIS

PARAMETER	METHOD OF ANALYSIS
ARSENIC	Silver Diethyldithiocarbamate Method (Colorimetric)
BOD <sub>5</sub>	Azide Modification (Dilution Technique)
BORON	Carmine Method (Colorimetric Method)
CADMIUM	Atomic Absorption Spectrophotometry (Wet ashing with concentration HNO <sub>3</sub> + HCl)
CHLORINATED HYDROCARBONS	Gas Chromatography (ECD)
CHROMIUM (HEXAVALENT)	Diphenyl Carbazide Colorimetric Method
COLOR	Visual Comparison Method (Platinum Cobalt Scale)
CYANIDE	Specific Ion Electrode Method
DISSOLVED OXYGEN	Azide Modification (Winkler Method), Membrane Electrode (DO meter)
FECAL COLIFORM	Multiple-Tube Fermentation Technique or Membrane Filter



LEAD

NITRATE AS NITROGEN

OIL AND GREASE

ORGANO PHOSPHORUS COMPOUNDS

POLYCHLORINATED BIPHENYL (PCB)

pH

PHENOLIC SUBSTANCES

PHENOLIC SUBSTANCES

SURFACTANT (MBAS)

TEMPERATURE

TOTAL COLIFORM

TOTAL MERCURY

TOTAL SUSPENDED SOLIDS

Atomic Absorption Spectrophotometry

Brucine Method for Saline Waters, specific Ion Electrode  
Meter for Fresh Water

Gravimetric Method (Petroleum Ether Extraction)

Gas Chromatography (FPD)

Gas Chromatography (ECD)

Glass Electrode Method

Chloroform Extraction Method

Stannous Chloride Method

Methylene Blue Method (Colorimetric)

Use of Mercury-Filled Thermometer

Multiple-Tube Fermentation Technique or Membrane Filter

Cold Vapor Technique, (Mercury Analyzer, AAS)

Gravimetric Method

**NOTE:** Other methods found in the Philippine Standard Methods for Air and Water Analysis, the "Standard Methods for the Examination of Water and Waste Waters", published jointly by American Public Health Association (APHA), the American Waterworks Association and the Water Pollution Control Federation of the U.S. or in accordance with such other method of analyses as the DENR may prescribe.

(e) Significant Parameters. - As a guide to dischargers and regulatory agencies the significant parameters to be considered for monitoring purposes are indicated in Table 6.

TABLE C. SIGNIFICANT PARAMETERS FOR SELECTED TYPES OF INDUSTRIES

TYPE OF INDUSTRY	SIGNIFICANT WASTEWATER PARAMETERS
A. BEVERAGE INDUSTRY	BOD <sub>5</sub> , pH, Suspended Solids, Settleable Solids, Oil and Grease
B. CEMENT, CONCRETE, LIME & GYPSUM	pH, Suspended Solids, Dissolved Solids, Temperature
C. DAIRY PRODUCT PROCESSING	BOD <sub>5</sub> , COD, pH, Suspended Solids, Dissolved Solids, Settleable Solids
D. FERROALLOY MFG. (WITH ELECTRIC FURNACE WITH WET AIR POLLUTION CONTROL)	Suspended Solids, Chromium (hexavalent), Oil and Grease, Phenols, Phosphates
E. FERTILIZER INDUSTRY NITROGEN FERTILIZER INDUSTRY PHOSPHATE FERTILIZER INDUSTRY	Chloride, Chromium, Dissolved Solids, Nitrate, Suspended Solids pH, Phosphorus, Suspended Solids, Temperature, Cadmium, Arsenic
F. GRAIN MILLING INDUSTRY	BOD <sub>5</sub> , COD, Chromium, Oil and Grease, pH, Suspended Solids, Color, Dissolved Solids
I. LIVESTOCK INDUSTRY	BOD <sub>5</sub> , COD, Total Suspended Solids, pH, Color, Total Coliform
J. MEAT, FISH AND FRUIT CANNING	BOD <sub>5</sub> , COD, Suspended Solids, pH, Oil & Grease, Dissolved Solids
K. MEAT PRODUCTS INDUSTRY	BOD <sub>5</sub> , pH, Suspended Solids, Settleable Solids, Oil and Grease, Total Coliform, Toxic Materials
L. METAL FINISHING INDUSTRY	Oil and Grease, Heavy Metals (Cr, Cd, etc.), Suspended Solids, Cyanide
M. MINERAL ORE PROCESSING (MINING INDUSTRY)	Suspended Solids, Heavy Metals (Hg, CN, Cd, etc.), Arsenic
N. ORGANIC CHEMICALS INDUSTRY	BOD <sub>5</sub> , COD, pH, Total Suspended Solids, Total Dissolved Solids, Oil (Free-Floating)
O. PETROLEUM REFINING INDUSTRY	BOD <sub>5</sub> , Heavy Metals, COD, Oil (Total), pH, Phenols, Suspended Solids, Temperature, Total Dissolved Solids
P. PLASTIC MATERIALS & SYNTHETIC INDUSTRY	BOD <sub>5</sub> , COD, pH, Total Suspended Solids, Oil and Grease, Phenols
Q. PULP & PAPER INDUSTRY	BOD <sub>5</sub> , COD, pH, Total Susp. Solids, E. Coli, Color, Heavy Metals, Dissolved Solids, Oil & Grease, Phenols
R. STEEL INDUSTRY	Oil and Grease, pH, Cyanide, Phenol, Susp. Solids, Temperature, Chromium
S. SUGAR CANE PROCESSING INDUSTRY	BOD <sub>5</sub> , pH, Suspended Solids, Oil and Grease
T. TEXTILE MILL INDUSTRY	BOD <sub>5</sub> , COD, pH, Suspended Solids, Chromium, Phenols, Color, Oil and Grease



U. THERMAL POWER GENERATION

BCD<sub>5</sub>, Color, Chromium, Oil and Grease, pH, Phosphate, Suspended Solids, Temperature

This Order shall take effect thirty (30) days after publication in the Official Gazette or any newspaper of general circulation.

APPROVED:

(Sgd.) FULGENCIO S. FACTORAN, JR.  
Secretary of the  
Environment and Natural Resources



DEPARTMENT OF  
ENVIRONMENT AND  
NATURAL RESOURCES

ADMINISTRATIVE ORDER

Erata to some Provisions of DENR Administrative Order No. 34, S. 1990 on the Revised Water Use and Classification (Water Quality Criteria and DENR Administrative Order No. 35, S. 1990 on the Revised Effluent Regulations of 1990.

In the interest of justice and pursuant to the provisions of Executive Order No. 192, Series of 1947, due to the number of errors, typographical as well as those which were inadvertently included, DENR Administrative Order Nos. 34 and 35 are hereby amended as follows:

1. The following shall be the corrections/modifications:

a. For DENR Administrative Order No. 34

- i) Footnote B, table 1, page 5 should read  
"For irrigation purposes, SAR should have a minimum value of 8 and a maximum value not to exceed 18. Boron should not exceed 0.75 mg/l".
- ii) The Water Quality Criteria for "Total Coliforms" for Class SC of Table 3 page 8 should be 5000<sup>MPN</sup> instead of 1000<sup>MPN</sup>.
- iii) Item (e) "significant parameters", page 10, should read:  
"As a guide . . . are indicated in Table 6".
- iv) Table 6A, page 10 should be Table 6.

b. For DENR Administrative Order No. 35

- i) The title of Table 1, Section 4, page 2 should read:  
"TABLE 1 - EFFLUENT . . . SUBSTANCE"  
(Maximum . . . Health)<sup>A</sup>
- ii) Footnote (A) of Section 4, Table \_\_, page 3 should read:  
"Except as otherwise indicated, all limiting values in Table 1 (Section 4) are maximum and therefore shall not be exceeded".
- iii) there shall be an additional footnote (No. 4) in Tables 2A and 2B, Section 5, page 5 which should read:



4. "The effluent standards apply to industrial manufacturing plants and municipal treatment plants discharging more than thirty (3) cubic meters per day".

iv) The effluent standards for "Total Dissolved Solids" of Class C, OEI and NPI Section 5, Table 2A, page 4) should be deleted i.e. 1500 mg/l 1000 mg/l, respectively.

The above corrections/modifications shall be published as required by law prior to implementation.

FOR IMMEDIATE COMPLIANCE

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## CHAPTER VI

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