Deutsch-Philippinische Industrie- und Handelskammer
German-Philippine Chamber of Commerce and Industry

Building Partnerships for a ENVIRONMENTAL PROTECTION made in Germany Sustainable Infrastructure

Waste Water Management & Compliance Workshop Series for SMEs

Waste Water Technologies – Basics

05 July 2021

Philippine Chamber of Commerce and Industry

REPUBLIC OF THE PHILIPPINES
DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES
ENVIRONMENTAL MANAGEMENT BUREAU

SEIPI

On behalf of
Federal Ministry for the Environment, Nature Conservation and Nuclear Safety
of the Federal Republic of Germany

Understanding the General Effluent Standards

Engr. Joma Lim
President
LCI Envi Corporation

Items for Discussion

- Water Classification, WQG & GES
- Strong Wastewater
- Effluent reuse for Irrigation
- Significant Parameters per Sector
- Modifying the GES

Water Body Classification, WQS & GES

Water Body Classification

Classification	Intended Beneficial Use
Class AA	Public Water Supply Class I – Intended primarily for waters having watersheds, which are uninhabited and/or otherwise declared as protected areas, and which require only approved disinfection to meet the latest PNSDW
Class A	Public Water Supply Class II – Intended as sources of water supply requiring conventional treatment (coagulation, sedimentation, filtration and disinfection) to meet the latest PNSDW
Class B	Recreational Water Class I – Intended for primary contact recreation (bathing, swimming, etc.)
Class C	1. Fishery Water for the propagation and growth of fish and other aquatic resources 2. Recreational Water Class II – For boating, fishing, or similar activities 3. For agriculture, irrigation, and livestock watering
Class D	Navigable waters

Classification	Intended Beneficial Use
Class SA	1. Protected Waters – Waters designated as national or local marine parks, reserves, sanctuaries, and other areas established by law (Presidential Proclamation 1801 and other existing laws), and/or declared as such by appropriate government agency, LGUs, etc. 2. Fishery Water Class I – Suitable for shellfish harvesting for direct human consumption
Class SB	1. Fishery Water Class II – Waters suitable for commercial propagation of shellfish and intended as spawning areas for milkfish (*Chanos chanos*) and similar species 2. Tourist Zones – For ecotourism and recreational activities 3. Recreational Water Class I – Intended for primary contact recreation (bathing, swimming, skin diving, etc.)
Class SC	1. Fishery Water Class III – For the propagation and growth of fish and other aquatic resources and intended for commercial and sustenance fishing 2. Recreational Water Class II – For boating, fishing, or similar activities 3. Marshy and/or mangrove areas declared as fish and wildlife sanctuaries
Class SD	Navigable waters

Water Quality Guidelines

Table 3. Water Quality Guidelines for Primary Parameters

Parameter	Unit	Water Body Classification								
		AA	A	B	C	D	SA	SB	SC	SD
BOD	mg/L	1	3	5	7	15	n/a	n/a	n/a	n/a
Chloride	mg/L	250	250	250	350	400	n/a	n/a	n/a	n/a
Color	TCU	5	50	50	75	150	5	50	75	150
Dissolved Oxygen[(a)] (Minimum)	mg/L	5	5	5	5	2	6	6	5	2
Fecal Coliform	MPN/100mL	<1.1	<1.1	100	200	400	<1.1	100	200	400
Nitrate as NO_3-N	mg/L	7	7	7	7	15	10	10	10	15
pH (Range)		6.5-8.5	6.5-8.5	6.5-8.5	6.5-9.0	6.0-9.0	7.0-8.5	7.0-8.5	6.5-8.5	6.0-9.0
Phosphate	mg/L	<0.003	0.5	0.5	0.5	5	0.1	0.5	0.5	5
Temperature[(b)]	°C	26-30	26-30	26-30	25-31	25-32	26-30	26-30	25-31	25-32
Total Suspended Solids	mg/L	25	50	65	80	110	25	50	80	110

Notes:

MPN/100mL – Most Probable Number per 100 milliliter
n/a – Not Applicable
TCU – True Color Unit
(a) Samples shall be taken from 9:00 AM to 4:00 PM.
(b) The natural background temperature as determined by EMB shall prevail if the temperature is lower or higher than the WQG; provided that the maximum increase is only up to 10 percent and that it will not cause any risk to human health and the environment.

Some parameters were updated based on DAO 2021-19.

General Effluent Standards

Table 9. Effluent Standards[g]

Parameter	Unit	Water Body Classification								
		AA	A	B	C	D	SA	SB	SC	SD
Ammonia as NH_3-N	mg/L	NDA	0.5	0.5	0.5	7.5	NDA	0.5	0.5	7.5
BOD	mg/L	NDA	20	30	50	120	NDA	30	100	150
Boron	mg/L	NDA	2	2	3	12	NDA	2	20	80
Chloride	mg/L	NDA	350	350	450	500	NDA	n/a	n/a	n/a
COD	mg/L	NDA	60	60	100	200	NDA	60	200	300
Color	TCU	NDA	100	100	150	300	NDA	100	150	300
Cyanide as Free Cyanide	mg/L	NDA	0.14	0.14	0.2	0.4	NDA	0.04	0.2	0.4
Fluoride	mg/L	NDA	2	2	2	4	NDA	3	3	6
Nitrate as NO_3-N	mg/L	NDA	14	14	14	30	NDA	20	20	30
pH (Range)		NDA	6.0-9.0	6.0-9.0	6.0-9.5	5.5-9.5	NDA	6.5-9.0	6.0-9.0	5.5-9.5
Phosphate	mg/L	NDA	1	1	1	10	NDA	1	1	10
Selenium	mg/L	NDA	0.02	0.02	0.04	0.08	NDA	0.02	0.2	0.4
Sulfate	mg/L	NDA	500	500	550	1,000	NDA	500	550	1,000
Surfactants (MBAS)	mg/L	NDA	2	3	15	30	NDA	3	15	30
Temperature[h]	°C change	NDA	3	3	3	3	NDA	3	3	3
Total Suspended Solids	mg/L	NDA	70	85	100	150	NDA	70	100	150

Some parameters were updated based on DAO 2021-19.

Things to consider

- Need to screen the classification of the receiving body of water
  - There are water bodies where NDA (no discharge is allowed).
  - A water body may have 2 or more classifications.
- GES depends on the water body classification.
  - Will have an impact on the treatment technology (i.e., efficiency requirements) that will be used.
  - Some water bodies are yet to be re-classified (upgraded)
  - For unclassified water bodies, classification will be based on the beneficial use as determined by EMB
  - No WQG for brackish water.
  - Consistent water quality monitoring failing to meet the WQG does not invalidate or lower the classification

Significant Effluent Quality Parameters per Industry Sector (PSIC)

Significant Effluent Quality Parameters per Sector

C. Manufacturing		
10110	Slaughtering and meat packing	Temperature, pH, BOD, Total Suspended Solids, Ammonia, Nitrate, Phosphate, Oil and Grease
10120	Production processing and preserving of meat and meat products	Temperature, pH, BOD, Total Suspended Solids, Oil and Grease
1020	Processing and preserving of fish, crustaceans and mollusks (except carrageenan)	Temperature, pH, BOD, Total Suspended Solids, Nitrate, Oil and Grease
I. Accommodation and Food Services		
55	Hotels, motels, resorts, dormitories and other accommodation services	BOD, Fecal Coliform, Ammonia, Nitrate, Phosphate, Oil and Grease, Surfactants

PSIC Code	Industry Category	Significant Parameters
56	Restaurants, food chains, bars and other food/beverage services	BOD, Total Suspended Solids, Oil and Grease, Surfactants

Significant Effluent Quality Parameters per Sector

E. Water Supply; Sewerage, Waste Management and Remediation Activities		
36000	Water collection, treatment and supply (except those intended to prevent pollution)	pH, Total Suspended Solids, Chloride, Fluoride, Iron
37000	Sewerage (operation of sewer systems or sewage treatment facilities that collect, treat, and dispose of sewage)	BOD, Fecal Coliform, Ammonia, Nitrate, Phosphate, Oil and Grease, Surfactants

Things to consider

- Significant parameters will be the basis for discharge permits (effluent sampling, analysis & monitoring).
- For sectors not listed in Table 8, EMB shall determine the significant parameters.
- Domestic sewage from all establishments shall be monitored by same parameters under PSIC 37000 (Note 2 of Table 8)
  - Process WWTP receiving sewage will include parameters under the industry category + those 7 other parameters
- No prescribed limit on volume (i.e., regardless of volume of wastewater generated).

Things to consider

JUN 30 2021

DENR ADMINISTRATIVE ORDER
No. 2021 - 19

SUBJECT: UPDATED WATER QUALITY GUIDELINES (WQG) AND GENERAL EFFLUENT STANDARDS (GES) FOR SELECTED PARAMETERS

Section 5. Requirements for Modification of Significant Effluent Quality Parameters (SEQP)

Any person or establishment, both natural and juridical, requesting for modification of SEQP shall submit to the EMB Central Office the methodology and subsequently, a technical report with justifications containing the following, among others:

5.1 Wastewater characterization
5.2 Monthly monitoring data for both influent and effluent covering a 1-year period;
5.3 Capital and operating costs of existing wastewater treatment plant;
5.4 Technology and designed treatment efficiency of existing wastewater treatment plant;
5.5 Wastewater sources for parameter of concern; and
5.6 Estimated additional expenses for compliance.

Strong Wastewater

Effluent Standards for Establishments with High BOD

Table 10. Effluent Standards for BOD Applicable to Establishments with Influent BOD of ≥ 3,000 mg/L

Influent BOD (mg/L)	Units	Class C	Class D	Class SC	Class SD
3,000 to <6,500	mg/L	100	150	100	150
6,500 to <10,000	mg/L	200	300	200	300
10,000 to 30,000	mg/L	600	1,000	600	1,000
>30,000	mg/L	900	1,500	900	1,500

Things to consider

- DAO 2016-08 does not prescribe what specific industries are producing such strong wastes.
- Influent sampling & monitoring is required to be established against available literature for similar type of trade effluents.

Clarification made by EMB from DAO 2021-19

4.7 GES for Strong Wastewater for BOD

The GES for strong wastewater particularly for BOD shall only apply once the establishment show proof that the influent data are within the prescribed influent values as indicated in Table 10 of DAO 2016-08 within the last twelve (12) months. Copy of the results of laboratory analyses from a DENR-recognized environmental laboratory shall be submitted to the EMB Central Office along with the letter of request.

This provision shall only apply to effluent being discharged to Classes C, D, SC, or SD water body.

Reuse of effluent

Department of Agriculture Administrative Order No. 2019-11: “Revised Guidelines on the Procedures and Technical Requirements for the issuance of a Certification allowing the safe re-use of wastewater for purposes of irrigation and other agricultural uses.”

Reuse for Irrigation

Parameters	Landscape Irrigation	Food eaten raw and not commercially processed	Food crops commercially processed	Non-food crops
For crop productivity and protection of environment				
Bicarbonates (mg/L)	<500	<500	<500	<500
BOD (mg/L)	<150	<150	<150	<150
Electrical conductivity (uS/cm)	<2000	<2000	<2000	<2000
Free residual chlorine (mg/L)	<1	<1	<1	<1
pH	6.5 to 8.0	6.5 to 8.0	6.5 to 8.0	6.5 to 8.0
Sodium Adsorption Ratio (SAR)	<18	<18	<18	<18
Sodium (meq/L)	<3	<3	<3	<3
Total Nitrogen (mg/L)	<30	<30	<30	<30
Total Phosphorous (mg/L)	<30	<30	<30	<30
Total Suspended Solids (mg/L)	<140	<140	<140	<140

Things to consider

- DA AO 2007-06 has been updated by DA AO 2019-11 (Guideline for re-use for irrigation and agricultural purposes).
- If you want to reuse effluent of STP or WWTP,
  - Secure certificate from NIA (for irrigation) & BFAR(for aquaculture)
  - Must meet/comply with DAO 2019-11 prescribed standards (for protection of public health; protection of environment; and suitability for agricultural reuse)
  - Certificate will be used to secure DP and must still meet the GES (in the absence of clear guidelines and standards for reuse).
- No equivalent AO for reuse for recreation water/impoundment or non-potable re-use
  - Must meet GES and secure DP prior to reuse.

Modifying GES

Modification of GES

8.1 Modification of Designated Uses. If the DENR Secretary, through EMB, determines that the request for modification is valid, the DENR shall promulgate such modification in accordance with RA 9275.

8.2 Modification of WQG Values. Any person, both natural and juridical, may request for the modification of a class-specific WQG value. If the DENR Secretary, through EMB, determines that the request is valid, the DENR shall promulgate such modification in accordance with RA 9275. Modification of WQG value of a water segment shall not result in a modification of the designated use of the water segment.

8.3 Modification of Significant Effluent Quality Parameters and GES Values. Any person, both natural and juridical, may request for the modification of the significant effluent quality parameters per sector and/or the GES values. If the DENR Secretary, through the EMB, determines that the request is valid, the DENR shall promulgate such modification in accordance with RA 9275. Provided that, modification of the GES value shall not result to exceedance of the WQG with respect to the designated use of the receiving water body.

Deutsch-Philippinische Industrie- und Handelskammer
German-Philippine Chamber of Commerce and Industry

Building Partnerships for a Sustainable Infrastructure
ENVIRONMENTAL PROTECTION made in Germany

Thank you for joining!

Philippine Chamber of Commerce and Industry

REPUBLIC OF THE PHILIPPINES
DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES
ENVIRONMENTAL MANAGEMENT BUREAU

SEIPI

On behalf of
Federal Ministry for the Environment, Nature Conservation and Nuclear Safety
of the Federal Republic of Germany