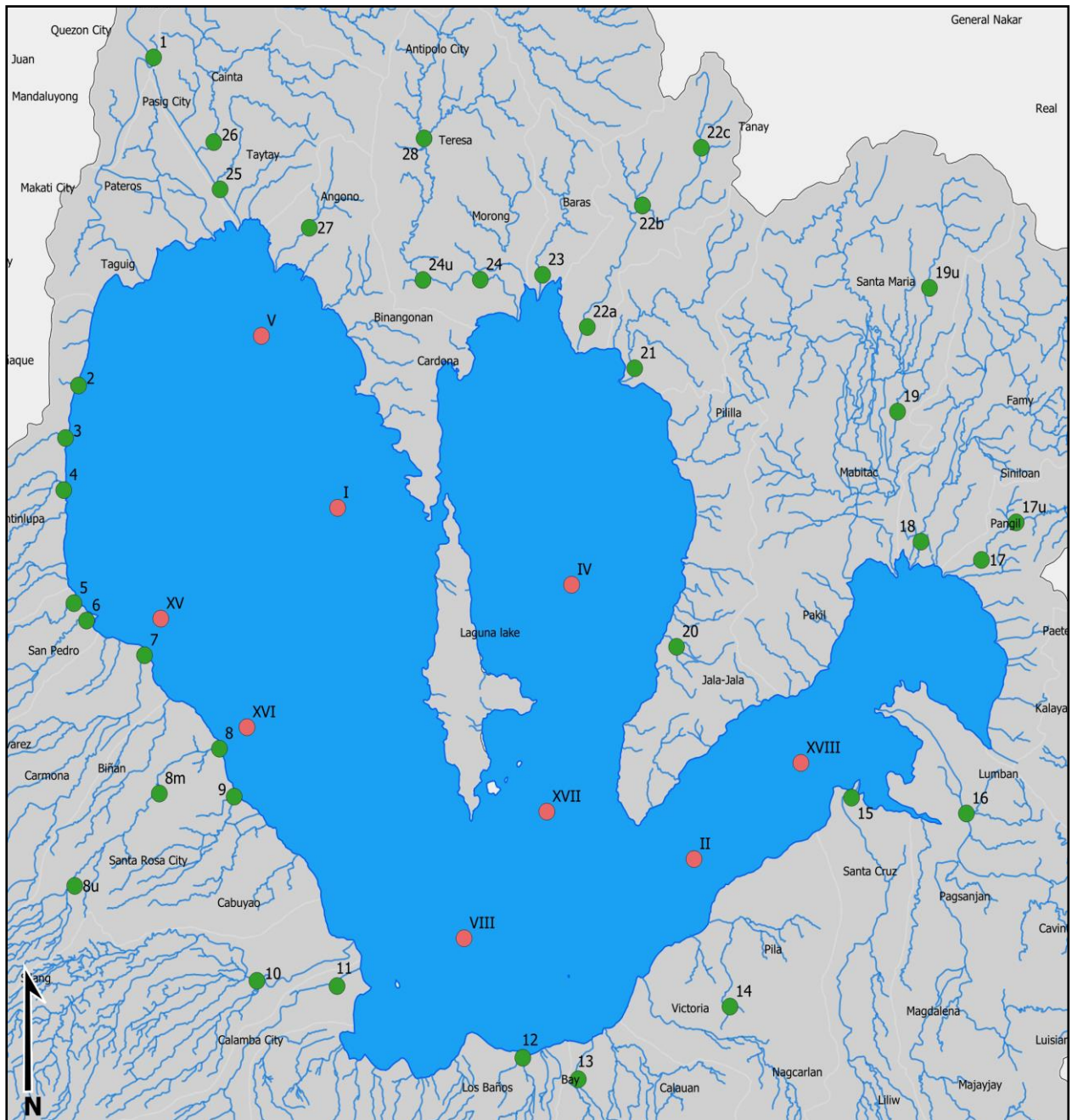


LLDA Quarterly Water Quality Monitoring Report

Laguna Lake and Tributary Rivers

October to December, 2020



Sampling Stations and Locations (Laguna de Bay and Tributary Rivers)

LLDA Quarterly Water Quality Report Laguna Lake and Tributary Rivers October to December, 2020

Laguna Lake Stations

Monitoring Stations	Water Quality Parameters								
	BOD (mg/L)			Dissolved Oxygen (mg/L)			Fecal Coliform, MPN/100ml (Geomean)		
	Oct.	Nov.	Dec.	Oct.	Nov.	Dec.	Oct.	Nov.	Dec.
Stn. I (Central West Bay)	2	-	2	7.3	6.8	7.1	20	-	45
Stn. II (East Bay)	3	-	2	7.0	7.2	7.9	20	-	30
Stn. IV (Central Bay)	2	-	2	7.8	8.3	8.3	45	-	45
Stn. V (Northern West Bay)	3	-	1	7.6	7.8	7.7	20	-	219
Stn. VIII (South Bay)	2	-	2	7.3	6.5	8.7	45	-	148
Stn.XV (San Pedro)	3	-	2	7.2	6.4	8.9	20	-	126
Stn.XVI (Sta. Rosa)	3	-	2	7.3	7.2	7.3	18	-	208
Stn.XVII (Sanctuary)	4	-	2	6.8	6.7	8.3	18	-	28
Stn.XVIII (Pagsanjan)	3	-	2	7.5	7.9	7.3	20	-	51

Note: No analysis due to Typhoon Ulyses

Tributary Rivers Stations

Station	Monitoring Stations	Water Quality Parameters								
		BOD (mg/L)			Dissolved Oxygen (mg/L)			Fecal Coliform, MPN/100ml (Geomean)		
		Oct.	Nov.	Dec.	Oct.	Nov.	Dec.	Oct.	Nov.	Dec.
1	Marikina River	12	-	-	-	-	-	790,000	-	-
2	Bagumbayan River (Taguig)	363	-	-	0.05	-	-	92,000,000	-	-
3	Buli Creek (Taguig)	314	-	-	0.05	-	-	54,000,000	-	-
4	Mangagate River (Muntinlupa) -Downstream	37	-	-	0.05	-	-	1,700,000	-	-
5	Tunasan River (Muntinlupa) -Downstream	41	-	-	0.05	-	-	2,200,000	-	-
6	San Pedro River (T ₂)	-	3	-	-	4.20	-	-	790,000	-
7	Biñan River	-	-	-	-	-	-	-	-	-
8	Sta. Rosa River - Downstream	-	4	-	-	6.90	-	-	1,100,000	-
8M	Sta. Rosa River - Midstream	-	4	-	-	4.30	-	-	2,200,000	-
8U	Sta. Rosa River - Upstream	-	14	-	-	4.20	-	-	2,400,000	-
9	Cabuyao River	-	13	-	-	0.05	-	-	3,500,000	-
10	San Cristobal River (T ₃)	-	10	-	-	2.70	-	-	3,500,000	-
11	San Juan River (T ₅)	-	4	-	-	6.30	-	-	330,000	-
12	Molawin Creek (Los Baños)	-	1	-	-	6.90	-	-	79,000	-
13	Bay River (T ₉)	-	2	-	-	6.20	-	-	240,000	-
14	Pila River	-	2	-	-	4.70	-	-	13,000	-
15	Sta. Cruz River (T ₆)	-	1	-	-	7.00	-	-	33,000	-
16	Pagsanjan River (T ₈)	-	1.5	-	-	7.00	-	-	13,000	-
17	Pangil River - Downstream	-	0.5	-	-	7.90	-	-	49,000	-
17U	Pangil River - Upstream	-	0.5	-	-	7.90	-	-	7,900	-
18	Siniloan River	-	0.5	-	-	6.20	-	-	23,000	-
19	Sta. Maria River - Downstream	-	0.5	-	-	7.00	-	-	22,000	-
19U	Sta. Maria River - Upstream	-	0.5	-	-	7.70	-	-	7,900	-
20	Jala-jala River	2	-	-	6.20	-	-	7,800	-	-
21	Pililla River	2	-	-	7.30	-	-	49,000	-	-
22 A	Tanay River - Brgy. Wawa	2	-	-	8.10	-	-	79,000	-	-
22 B	Tanay River -Midstream	2	-	-	7.50	-	-	13,000	-	-
22 C	Tanay River- Daranak	2	-	-	6.80	-	-	4,900	-	-
23	Baras River	2	-	-	6.80	-	-	130,000	-	-
24	Morong River - Downstream	11	-	-	4.80	-	-	130,000	-	-
24U	Morong River - Upstream	8	-	-	3.00	-	-	70,000	-	-
25	Manggahan Floodway (Taytay)	12	-	-	0.70	-	-	790,000	-	-
26	Sapang Baho River (Cainta)	21	-	-	0.30	-	-	3,500,000	-	-
27	Angono River	12	-	-	3.70	-	-	1,300,000	-	-
28	Teresa River	11	-	-	5.80	-	-	920,000	-	-

Legend: Based on DENR Administrative Order NO.2016-08:

For BOD:

	Conformed with Class A (concentration of less than & up to 3 mg/L)
	Conformed with Class B (concentration of more than 3 mg/L & up to 5 mg/L)
	Conformed with Class C (concentration of more than 5 mg/L & up to 7 mg/L)
	Conformed with Class D (concentration of more than 7 mg/L & up to 15 mg/L)
	Failed the water quality guidelines for Classes A to D (more than 15 mg/L)
	No data

For DO:

	Conformed with Classes A, B and C (concentration of more than & equal to 5 mg/L)
	Conformed with Class D (concentration of more than & equal to 2 mg/L up to less than 5 mg/L)
	Failed the water quality guidelines for Classes A to D (less than 2 mg/L)
	No data

For Fecal Coliform:

	Conformed with Class A (< 1.1 MPN/100mL)
	Conformed with Class B (>1.1 up to 100 MPN/100mL)
	Conformed with Class C (more than 100 up to 200 MPN/100mL)
	Conformed with Class D (more than 200 up to 400 MPN/100mL)
	Failed the water guidelines for Classes A to D (more than 400 MPN/100mL)
	No data

* Notes:

- No data/no analysis

LLDA Quarterly Water Quality Report Laguna Lake and Tributary Rivers October to December, 2020

Laguna Lake Stations

Monitoring Stations	Water Quality Parameters											
	pH (units)			Ammonia (mg/L)			Nitrate (mg/L)			Inorganic Phosphate (mg/L)		
	Oct.	Nov.	Dec.	Oct.	Nov.	Dec.	Oct.	Nov.	Dec.	Oct.	Nov.	Dec.
Stn. I (Central West Bay)	8.8	7.9	8.0	0.005	0.005	0.005	0.050	-	-	0.065	0.029	0.066
Stn. II (East Bay)	8.5	7.9	8.0	0.019	0.005	0.005	0.050	-	-	0.049	0.086	0.083
Stn. IV (Central Bay)	8.8	8.4	8.2	0.025	0.005	0.005	0.781	-	-	0.097	0.027	0.064
Stn. V (Northern West Bay)	8.4	8.4	8.2	0.019	0.005	0.005	0.050	-	-	0.093	0.044	0.077
Stn. VIII (South Bay)	8.7	8.0	8.5	0.019	0.005	0.005	0.050	-	-	0.044	0.042	0.029
Stn. XV (San Pedro)	8.7	8.0	8.0	0.027	0.016	0.005	0.050	-	-	0.041	0.054	0.048
Stn. XVI (Sta. Rosa)	8.8	7.9	8.1	0.011	0.005	0.005	0.050	-	-	0.042	0.047	0.081
Stn. XVII (Sanctuary)	8.3	8.0	8.4	0.019	0.005	0.005	0.050	-	-	0.068	0.043	0.041
Stn. XVIII (Pagsanjan)	8.2	7.7	8.1	0.005	0.005	0.013	0.050	-	-	0.040	0.061	0.063

Note : No nitrate analysis due to inavailability of chemicals

Tributary River Stations

Station	Monitoring Stations	Water Quality Parameters											
		pH (units)			Ammonia (mg/L)			Nitrate (mg/L)			Inorganic Phosphate (mg/L)		
		Oct.	Nov.	Dec.	Oct.	Nov.	Dec.	Oct.	Nov.	Dec.	Oct.	Nov.	Dec.
1	Marikina River	7.7	-	-	0.30	-	-	0.858	-	-	0.08	-	-
2	Bagumbayan River (Taqiug)	6.8	-	-	4.14	-	-	0.050	-	-	1.94	-	-
3	Buli Creek (Taqiug)	7.1	-	-	3.64	-	-	0.050	-	-	1.05	-	-
4	Mangagate River (Muntinlupa) -Downstream	7.4	-	-	2.60	-	-	1.220	-	-	0.64	-	-
5	Tunasan River (Muntinlupa) -Downstream	7.3	-	-	1.83	-	-	0.050	-	-	1.16	-	-
6	San Pedro River (T ₂)	-	7.7	-	-	2.08	-	-	-	-	-	0.34	-
7	Biñan River	-	-	-	-	-	-	-	-	-	-	-	-
8	Sta. Rosa River - Downstream	-	8.1	-	-	0.86	-	-	-	-	-	0.25	-
8M	Sta. Rosa River - Midstream	-	7.9	-	-	1.01	-	-	-	-	-	0.26	-
8U	Sta. Rosa River - Upstream	-	7.8	-	-	0.95	-	-	-	-	-	0.23	-
9	Cabuyao River	-	7.6	-	-	3.00	-	-	-	-	-	0.38	-
10	San Cristobal River (T ₃)	-	7.5	-	-	0.03	-	-	-	-	-	0.30	-
11	San Juan River (T ₅)	-	7.5	-	-	0.19	-	-	-	-	-	0.32	-
12	Molawin Creek (Los Baños)	-	7.3	-	-	0.09	-	-	-	-	-	0.27	-
13	Bay River (T ₉)	-	8.0	-	-	0.11	-	-	-	-	-	0.11	-
14	Pila River	-	7.4	-	-	0.08	-	-	-	-	-	0.09	-
15	Sta. Cruz River (T ₆)	-	7.7	-	-	0.16	-	-	-	-	-	0.29	-
16	Pagsanjan River (T ₈)	-	7.1	-	-	0.01	-	-	-	-	-	0.03	-
17	Pangil River - Downstream	-	7.4	-	-	0.01	-	-	-	-	-	0.04	-
17U	Pangil River - Upstream	-	7.3	-	-	0.01	-	-	-	-	-	0.04	-
18	Sinloan River	-	7.0	-	-	0.03	-	-	-	-	-	0.06	-
19	Sta. Maria River - Downstream	-	7.4	-	-	0.03	-	-	-	-	-	0.06	-
19U	Sta. Maria River - Upstream	-	7.4	-	-	0.05	-	-	-	-	-	0.12	-
20	Jala-jala River	4.1	-	-	0.14	-	-	-	-	-	-	0.03	-
21	Pillilla River	7.9	-	-	0.09	-	-	-	-	-	-	0.18	-
22 A	Tanay River - Brgy. Wawa	8.2	-	-	0.12	-	-	-	-	-	-	0.12	-
22 B	Tanay River - Midstream	8.4	-	-	0.10	-	-	-	-	-	-	0.10	-
22 C	Tanay River- Daranak	8.5	-	-	0.04	-	-	-	-	-	-	0.07	-
23	Baras River	7.8	-	-	0.22	-	-	-	-	-	-	0.23	-
24	Morong River - Downstream	8.0	-	-	2.28	-	-	2.790	-	-	-	0.76	-
24U	Morong River - Upstream	7.7	-	-	2.06	-	-	2.400	-	-	-	0.75	-
25	Mangqahan Floodway (Taytay)	7.4	-	-	3.59	-	-	0.050	-	-	-	0.43	-
26	Sapang Baho River (Cainta)	7.4	-	-	2.56	-	-	0.050	-	-	-	0.54	-
27	Anqono River	7.6	-	-	2.05	-	-	1.470	-	-	-	0.36	-
28	Teresa River	8.0	-	-	0.33	-	-	2.170	-	-	-	0.16	-

Legend: Based on DENR Water Quality Guidelines No.2016-08 :

For pH:

- Conformed with Classes A and B (acceptable range = 6.5 to 8.5)
- Conformed with Class C (acceptable range = 6.5 to 9.0)
- Conformed with Class D (acceptable range = 6.0 to 9.0)
- Failed the water quality guidelines for Classes A to D (less than 6 and more than 9)
- No data

For Ammonia:

- Conformed with Classes A, B and C (concentration of less than and up to 0.05 mg/L)
- Conformed with Class D (concentration of more than 0.05 mg/L and up to 0.75)
- Failed the water quality guidelines for Classes A to D (more than 0.75 mg/L)
- No data

For Nitrate:

- Conformed with Classes A, B and C (concentration of less than and up to 7 mg/L)
- Conformed with Class D (concentration of more than 7 and up to 15 mg/L)
- Failed the water quality guidelines for Classes A to D (more than 15 mg/L)
- No data

For Phosphate:

- Conformed with Classes A, B and C (concentration of less than and up to 0.5 mg/L)
- Conformed with Class D (concentration of more than 0.5 mg/L and up to 5 mg/L)
- Failed the water quality guidelines for Classes A to D (concentration of more than 5 mg/L)
- No data

FINDINGS FOR THE FOURTH QUARTER OF 2020:

Note: In view of the limited mobility brought about by the General Community Quarantine (GCQ) in Metro Manila and the implementation of Alternative Work Arrangement, the monitoring of thirty-five (35) tributary rivers was split into two (2) groups; seventeen (17) tributaries in October and eighteen (18) rivers in November. For this last quarter, the monthly sampling in Laguna Lake was already recommenced. No results in BOD and Fecal Coliform in November due to power interruption caused by Typhoon Ulysses.

A. On Biochemical Oxygen Demand (BOD):

Laguna Lake:

- Except in Stn. XVII (Northern West Bay) which was assessed at Class B, the BOD concentrations in the lake stations conformed with the DENR Water Quality (WQ) Guidelines for Class A in October and December.
- The highest BOD concentration was 4.0 mg/L in Stn. XVII in October while the lowest was 1.0mg/L in Stn. V (Northern West Bay) in December.

Tributary Rivers:

- In October, out of the seventeen (17) tributary stations sampled and analyzed:
 - Six (6) tributaries conformed with Class A: Stns. 20, 21, 22A, 22B, 22C and 23.
 - Six (6) tributaries conformed with Class D: Stns. 1, 24, 24U, 25, 27 and 28.
 - Five (5) tributaries failed the WQ Guidelines for Classes A to D: Stns. 2, 3, 4, 5 and 26.
 - The highest BOD concentration was at 363 mg/L in Stn. 2 (Bagumbayan River) while the lowest was at 2 mg/L in Stns. 20, 21, 22A, 22B, 22C and 23.
- In November, no sample in Biñan River due to inaccessibility. Out of the seventeen (17) tributary stations sampled and analyzed:
 - Eleven (11) tributary rivers were assessed at Class A: Stns. 6, 12, 13, 14, 15, 16, 17, 17U, 18, 19 and 19U.
 - Three (3) tributaries were at Class B: Stns. 8, 8M and 11.
 - Three (3) tributaries were at Class D: Stns. 8U, 9 and 10.
 - The highest BOD concentration was measured at 14.8 mg/L in Stn. 8U (Sta. Rosa River-Upstream) whereas the lowest concentration was at 0.5 mg/L noted in Stns. 17, 17U, 18, 19 and 19U.

B. On Dissolved Oxygen (D.O.):

Laguna Lake:

- All nine (9) lake stations consistently conformed with the WQ Guidelines for Classes A, B and C.

- The highest and lowest monthly DO concentrations were both noted in Stn. XV (San Pedro) at 8.9 mg/L in December and 6.4 mg/L in November, respectively.

Tributary Rivers:

- In October, out of the seventeen (17) tributary stations sampled and analyzed:
 - Six (6) tributaries conformed with Class A: Stns. 20, 21, 22A, 22B, 22C and 23.
 - Three (3) tributary rivers conformed with Class D: Stns. 24, 24U and 26.
 - Six (6) tributaries failed to meet the WQ Guidelines for Classes A to D: Stns. 2, 3, 4, 5, 25 and 26.
 - The highest DO reading was at 8.1 mg/L in Stn. 22 A (Tanay River-Brgy. Wawa) while the lowest was at 0.05 mg/L noted in Stns. 2, 3, 4 and 5.
- In November, out of the seventeen (17) tributary stations sampled and analyzed:
 - Eleven (11) tributary rivers were assessed at Class A: Stns. 8, 11, 12, 13, 15, 16, 17, 17U 18, 19 and 19U.
 - Five (5) tributaries were at Class D: Stns. 6, 8M, 8U, 10 and 14.
 - One (1) tributary river failed the WQ Guidelines for Classes A to D: Stn. 9 (Cabuyao River).
 - The highest DO level was measured at 7.9 mg/L in Stns. 17 and 17U while the lowest was at 0.05 mg/L in Stn. 9 (Cabuyao River).

C. On Fecal Coliform:

Laguna Lake:

- In October, the fecal coliform counts in all the nine (9) lake monitoring stations conformed with the DENR WQ Guidelines for Class B.
- In December, Stns. I, II, IV, XVII and XVIII were assessed at Class B; Stns. VIII and XV at Class C; and Stns. V and XVI were at Class D.
- The highest fecal coliform counts was at 219 MPN/100mL in Stn.V (Northern West Bay) in December while the lowest at 18 MPN/100mL in Stns. XVI and XVII in October.

Tributary Rivers:

- None of the tributaries sampled in October and November met the WQ Guidelines for Classes A to D.
- The fecal coliform counts in tributaries in October and November ranged from 4,900 MPN/100 mL to 92,000,000 MPN/100 ml. The highest and lowest fecal coliform counts were both measured in October in Stn. 2 (Bagumbayan River) and in Stn. 22C (Tanay River-Daranak), respectively.

D. On pH :

Laguna Lake:

- In November and December, all the nine (9) lake stations conformed with the WQ Guidelines for Classes A and B. On the other hand, Stns. II, V, XVII and XVIII were assessed at Class A while Stns. I, IV, VIII, XVI and XVII were at Class C in October.
- The highest pH at 8.8 was measured in Stns. I, IV and XVI in October while lowest at 7.7 was noted in Stn. XVIII in November.

Tributary Rivers:

- All the tributaries sampled in October and November conformed with Classes A and B except Stn. 20 (Jala-jala River) with pH value of 4.1 and failed to meet the WQ Guidelines for Classes A to D. The pH ranged from 4.1 to 8.5 both measured in October. The highest pH was in Stn. 22C (Tanay River-Daranak).

E. On Ammonia:

Laguna Lake:

- The ammonia concentrations in all the nine (9) lake sampling stations always conformed with the WQ Guidelines for Classes A, B and C.
- The highest ammonia concentration was at 0.027 mg/L in Stn. XV (San Pedro) while the lowest was at 0.005 mg/L in Stns. I and XVIII in October; and generally in all stations in November and December, except in Stn. XV in November and in Stn. XVIII in December.

Tributary Rivers:

- In October, out of the seventeen (17) tributary stations sampled and analyzed:
 - Only Stn. 22C (Tanay River-Daranak) conformed with the WQ Guidelines for Classes A, B and C.
 - Seven (7) tributaries were assessed at Class D: Stns. 1, 20, 21, 22A, 22B, 23 and 28.
 - Nine (9) tributaries failed to conform with Classes A to D: Stns. 2, 3, 4, 5, 24, 24U, 25, 26 and 27.
 - The highest ammonia concentration was at 4.140 mg/L in Stn. 2 (Bagumbayan River) while the lowest was at 0.04 mg/L in Stn. 22C (Tanay River-Daranak).
- In November, from the seventeen (17) tributaries:
 - Seven (7) stations conformed with Classes A, B and C: Stns. 10, 16, 17, 17U, 18, 19 and 19U.
 - Five (5) tributaries were assessed at Class D: Stns. 11, 12, 13, 14 and 15
 - Five (5) stations failed to meet the WQ Guidelines for Classes A to D: Stns. 6, 8, 8M, 8U and 9.

- The levels of ammonia ranged from 0.01 mg/L to 3.0 mg/L. The lowest was measured in Stns. 16, 17 and 17U while highest was in Stn. 9 (Cabuyao River).

F. On Nitrate:

Note: No nitrate analysis in November and December due to unavailability of chemicals.

Laguna Lake:

- The nitrate concentrations in all the nine (9) lake stations conformed with the WQ Guidelines for Classes A, B and C which ranged from 0.05 mg/L to 0.781 mg/L.

Tributary Rivers:

- All the tributaries had nitrate concentrations assessed at Classes A, B and C.
- The lowest concentration at 0.05 mg/L was measured in Stns. 2, 3, 25 and 26 while the highest at 2.790 mg/L was in Stn. 24 (Morong River-Downstream).

G. On Inorganic Phosphate:

Laguna Lake:

- All inorganic phosphate concentrations in the nine (9) lake stations conformed with the DENR WQ Guidelines for Classes A, B and C.
- The highest and lowest phosphate concentrations were both observed in Stn. IV (Central Bay) at 0.097 mg/L in October while the lowest was at 0.027 mg/L in November.

Tributary Rivers:

- In October, from seventeen (17) tributary rivers sampled and analyzed:
 - Ten (10) tributaries conformed with the WQ Guidelines for Classes A, B and C: Stns. 1, 20, 21, 22A, 22B, 22C, 223, 25, 27 and 28.
 - Seven (7) river stations were assessed at Class D: Stns. 2, 3, 4, 5, 24, 24U and 26.
 - The highest phosphate concentration at 1.94 mg/L was noted in Stn. 2 (Bagumbayan River) while the lowest at 0.03 mg/L in Stn. 20 (Jala-jala River).
- In November, all the seventeen (17) tributaries had phosphate concentrations assessed at Classes A, B and C. The highest concentration was at 0.38 mg/L registered in Stn. 9 (Cabuyao River) while the lowest at 0.03 mg/L was noted in Stn. 16 (Pagsanjan River).

Comparing the available data presented in the 1st quarter with the 4th quarter, it appeared that the water quality of the lake in the 4th quarter was better in terms of pH, ammonia and BOD. For pH, all the nine (9) monitoring stations in the lake were constantly assessed at Classes A and B in two (2) consecutive months, November

and December unlike in the 1st quarter, it was only in January that all nine (9) lake stations consistently conformed with Classes A and B, as all stations were at Class C in March. For ammonia, all the lake stations consistently conformed with Classes A, B and C in the 4th quarter while in the 1st quarter, only Stns. XV and XVIII were constantly assessed at Classes A, B and C. In terms of BOD, although no results in November because of the typhoon Ulysses the results in the 4th quarter showed better water quality than in the 1st quarter. All the lake stations conformed with Class A except Stn. XVII which was assessed at Class B in October whereas in the 1st quarter, only five (5) stations constantly conformed with WQ Guidelines for Class A in January to March as Stns. IV and V were assessed at Class B in January and February and Stns. XVI and XVIII at Class in January.

For the tributary rivers, the data in February (as 1st quarter of 2020) are compared with the data in October and November (as 4th quarter of 2020). The water quality of the tributaries appeared to be better in the 4th quarter than in the 1st quarter in terms of BOD, DO, ammonia and phosphate. For BOD, there were seventeen (17) tributary stations in the 4th quarter that conformed with WQ Guidelines for Class A as compared to only seven (7) tributaries in the 1st quarter of 2020. Moreover, five (5) tributaries failed to conform with the WQ Guidelines for Classes A to D in the 4th quarter as compared to eleven (11) in the 1st quarter. In terms of DO, eighteen (18) tributary stations were assessed at Classes A, B and C in the 4th quarter while thirteen (13) tributaries in the 1st quarter. Likewise, only five (5) tributary rivers failed to comply with WQ Guidelines for Classes A to D in the 4th quarter while eleven (11) in the 1st quarter. For ammonia, eight (8) tributary rivers conformed with Classes A, B and C and fourteen (14) tributaries failed the WQ Guidelines for Classes for A to D in the 4th quarter as compared to only five (5) stations that conformed with Classes A, B and C and twenty (20) rivers that failed to conform with the WQ Guidelines for Classes A to D in the 1st quarter of 2020. In terms of phosphate, twenty-seven (27) tributary stations conformed with WQ Guidelines for Classes A to C in the 4th quarter as compared to twenty-one (21) stations in the 1st quarter. In addition, seven (7) tributary stations were assessed at Class D in the 4th quarter while twelve (12) tributaries in the 1st quarter of 2020.

With regard to fecal coliform counts, the water quality of the lake seemed to be better in the 1st quarter than in the 4th quarter. In the 1st quarter, all the nine (9) lake monitoring station conformed with WQ Guidelines for Class B while in the 4th quarter Stns. VIII and XV conformed with Class C in December and Stns. V and XVI were at Class D. The same was observed in the tributaries wherein the fecal coliform counts in most of the tributary stations worsened in the 4th quarter. Twenty (20) stations had increased fecal coliform counts and these were Stns. 1, 2, 3, 9, 11, 14, 15, 16, 17, 17U, 19U, 21, 22C to 28. It was noted that the worsened results of fecal coliform counts were measured in the highly populous and highly dense areas both in the lake and in the tributaries. The presence of fecal coliform in aquatic environments indicates that the water has been contaminated with the fecal material of man or other animals (<https://www.water-research.net/index.php/fecal-coliform-bacteria-in-water>). The results in the fecal coliform counts in both the lake and tributaries could somehow be associated with the effects of the COVID 19 pandemic since during the implementation of ECQ and GCQ, people were kept and stayed in their houses and thus human wastes increased in the areas and consequently caused an increase in the concentration in level of fecal coliform counts.

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