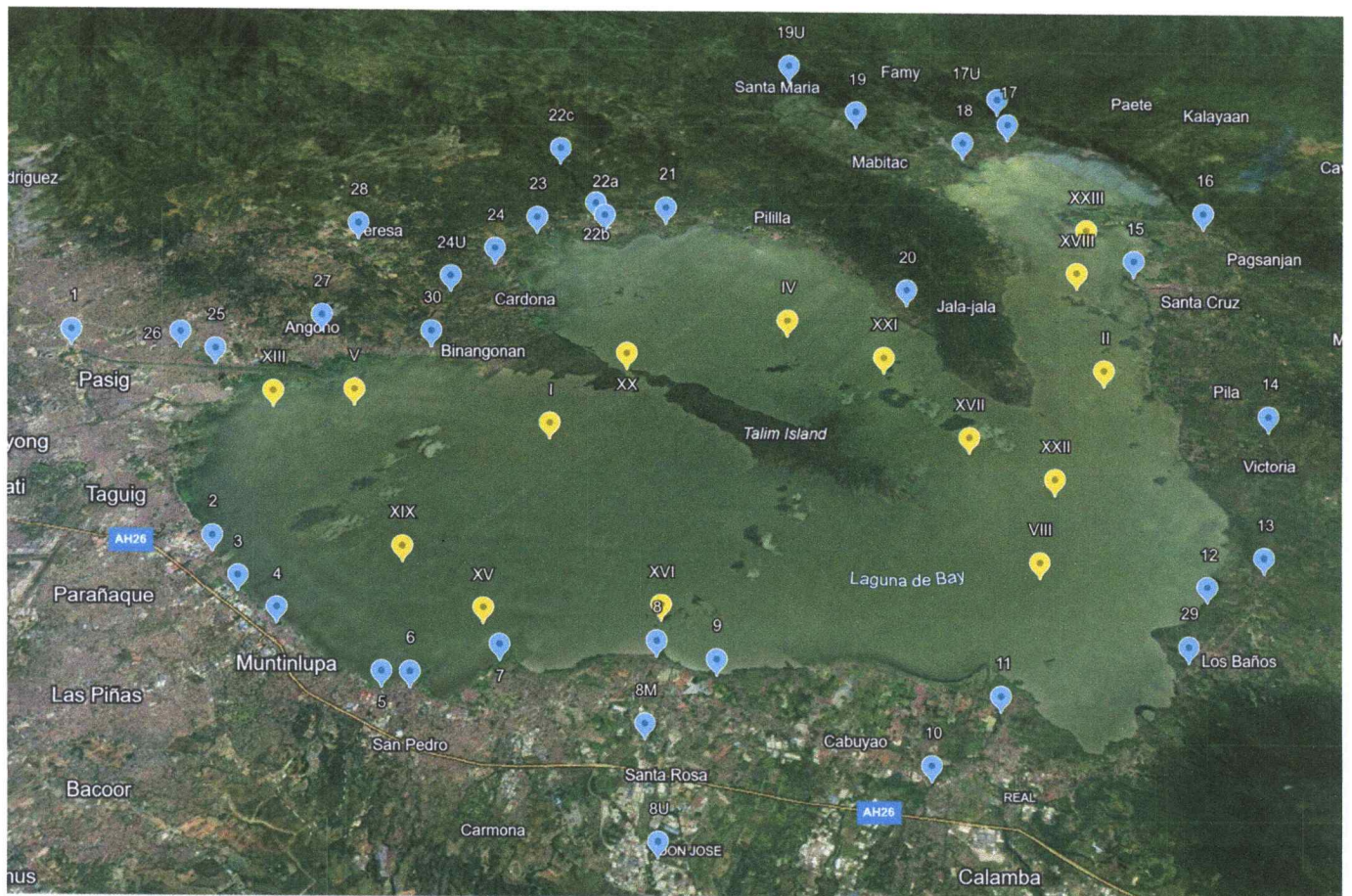


# LLDA Quarterly Water Quality Monitoring Report

## Laguna Lake and Tributary Rivers

April to June 2024



Laguna Lake Development Authority  
Resource Management and Development Department  
Environmental Laboratory and Research Division

Quarterly Water Quality Report  
Laguna Lake and Tributary Rivers  
April to June 2024

Laguna Lake Stations

Monitoring Stations		Water Quality Parameters											
		BOD (mg/L)			Dissolved Oxygen (mg/L)			Fecal Coliform (MPN/100mL) in Geomean			Chloride (mg/L)		
		Apr	May	Jun	Apr	May	Jun	Apr	May	Jun	Apr	May	Jun
I	(Central West Bay)	2	4	4	6.8	9.0	8.0	116	120	194	32	530	1,020
II	(East Bay)	1	3	4	8.1	8.1	5.0	57	75	57	32	16	56
IV	(Central Bay)	2	2	7	7.2	7.8	10.0	30	30	19	30	26	52
V	(Northern West Bay)	*	6	4	*	12.5	7.0	51	48	64	*	1,160	1,680
VIII	(South Bay)	1	2	2	8.0	7.7	7.0	69	69	44	30	16	64
XIII	(Taytay)	*	7	5	*	10.2	9.0	76	1,094	1,742	*	1,540	1,020
XV	San Pedro (West Bay)	2	2	3	7.1	6.8	8.0	78	57	44	30	100	600
XVI	Sta Rosa (West Bay)	2	2	2	7.4	7.3	7.0	40	40	57	28	10	320
XVII	Fish Sanctuary (Central Bay)	2	2	4	7.4	7.8	11.0	81	81	42	31	18	212
XVIII	Pagsanjan (East Bay)	2	3	4	8.0	7.2	7.0	26	25	30	22	12	20
XIX	(Muntinlupa)	5	3	2	7.2	6.4	7.0	93	71	102	36	395	980
XX	(GEMS)	2	3	3	6.8	7.4	6.0	170	376	376	26	310	4,800
XXI	(Cardona)	2	2	7	7.4	7.3	13.0	26	25	19	30	24	368
XXII	(Jala-jala)	2	2	2	7.8	8.1	6.0	29	29	42	28	16	88
XXIII	(Lumban)	2	4	4	10.0	7.2	7.0	24	33	57	12	10	16

Monitoring Stations		Water Quality Parameters														
		pH (units)			Ammonia (mg/L)			Nitrate (mg/L)			Inorganic Phosphate (mg/L)			Total Suspended Solids (mg/L)		
		Apr	May	Jun	Apr	May	Jun	Apr	May	Jun	Apr	May	Jun	Apr	May	Jun
I	(Central West Bay)	8.3	9.4	9.2	0.100	0.01	0.08	<0.1	<0.1	0.20	0.100	0.140	0.061	47	26	19
II	(East Bay)	8.1	8.7	7.7	0.070	0.03	0.09	<0.1	<0.1	0.70	0.066	0.067	0.077	32	21	32
IV	(Central Bay)	8.1	8.6	9.4	0.060	<0.01	0.02	<0.1	<0.1	0.20	0.090	0.071	0.060	81	17	37
V	(Northern West Bay)	*	9.3	9.1	*	0.07	0.08	*	<0.1	<0.1	*	0.150	0.140	*	35	33
VIII	(South Bay)	8.4	8.6	8.4	0.050	0.03	0.04	<0.1	<0.1	0.10	0.066	0.071	0.075	34	29	23
XIII	(Taytay)	*	9.2	9.3	*	0.90	0.02	*	0.20	<0.1	*	0.320	0.170	*	48	15
XV	San Pedro (West Bay)	8.6	8.7	8.8	0.050	0.02	0.06	<0.1	<0.1	<0.1	0.110	0.130	0.100	42	22	14
XVI	Sta Rosa (West Bay)	8.6	8.5	8.4	0.040	0.01	0.07	<0.1	<0.1	0.10	0.079	0.081	0.082	42	32	19
XVII	Fish Sanctuary (Central Bay)	8.5	8.7	9.2	0.040	0.03	0.03	<0.1	<0.1	<0.1	0.072	0.053	0.039	33	22	20
XVIII	Pagsanjan (East Bay)	8.5	9.1	7.8	0.040	0.03	0.06	<0.1	<0.1	0.60	0.040	0.054	0.055	35	18	51
XIX	(Muntinlupa)	8.7	9.0	9.1	0.060	0.04	0.10	<0.1	<0.1	<0.1	0.150	0.170	0.080	69	25	11
XX	(GEMS)	8.4	9.0	9.0	0.040	0.03	0.20	<0.1	<0.1	0.10	0.075	0.110	0.110	31	20	9
XXI	(Cardona)	8.6	8.5	9.6	0.070	0.02	0.04	<0.1	<0.1	<0.1	0.080	0.066	0.025	23	19	30
XXII	(Jala-jala)	8.5	8.7	8.1	0.060	0.02	0.05	<0.1	<0.1	0.30	0.064	0.071	0.083	26	28	25
XXIII	(Lumban)	8.8	8.0	7.5	0.050	0.05	0.06	<0.1	<0.1	0.30	0.060	0.083	0.037	17	38	26

\* No sample due to shallow water

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**Laguna Lake Development Authority**  
**Resource Management and Development Department**  
**Environmental Laboratory and Research Division**

**Quarterly Water Quality Report**  
**Laguna Lake and Tributary Rivers**  
**April to June 2024**

**Tributary Rivers Stations**

Station	Monitoring Stations	Water Quality Parameters								
		BOD (mg/L)			Dissolved Oxygen (mg/L)			Fecal Coliform (MPN/100mL) in Geomean		
		Apr	May	Jun	Apr	May	Jun	Apr	May	Jun
1	Marikina River	39	24	25	<0.1	0.4	<0.1	1,277,645	1,879,182	3,086,378
2	Bagumbayan River (Taguig)	181	304	282	<0.1	<0.1	<0.1	11,519,940	13,508,088	8,958,243
3	Buli Creek	146	102	143	<0.1	<0.1	<0.1	6,215,328	8,604,252	25,158,987
4	Mangangate River (Muntinlupa) -Downstream	35	42	40	<0.1	<0.1	<0.1	9,558,020	21,000,000	29,071,563
5	Tunasan River (Muntinlupa) -Downstream	24	38	246	<0.1	<0.1	<0.1	6,181,579	5,271,762	7,954,060
6	San Pedro River (T <sub>2</sub> )	10	9	12	1.0	1.0	2.0	874,703	656,650	851,370
7	Biñan River	49	22	28	<0.1	<0.1	0.2	16,708,287	7,920,356	6,783,365
8	Sta. Rosa River - Downstream	52	64	26	<0.1	<0.1	<0.1	11,519,940	11,519,940	16,025,999
8M	Sta. Rosa River - Midstream	71	37	70	0.4	1.0	1.0	3,470,251	4,465,297	9,757,640
8U	Sta. Rosa River - Upstream	5	4	9	5.3	6.0	5.0	690,274	680,121	1,155,899
9	Cabuyao River	71	69	17	<0.1	<0.1	3.0	8,958,243	10,414,883	5,286,354
10	San Cristobal River (T <sub>3</sub> )	46	65	14	<0.1	<0.1	1.0	14,211,747	19,004,616	24,640,179
11	San Juan River (T <sub>5</sub> )	4	4	7	5.3	5.1	5.0	606,367	435,874	306,044
12	Molawin Creek (Los Baños)	3	9	1	2.9	2.0	6.0	66,803	277,174	176,088
13	Bay River (T <sub>5</sub> )	2	2	2	6.8	4.8	5.0	58,752	64,248	83,300
14	Pila River	2	2	2	4.1	1.3	2.0	15,261	10,724	9,661
15	Sta. Cruz River (T <sub>6</sub> )	1	2	3	5.4	4.2	8.0	19,378	61,937	83,434
16	Pagsanjan River (T <sub>6</sub> )	2	<1	2	6.3	7.0	6.0	10,965	10,965	10,965
17	Pangil River - Downstream	2	1	<1	7.0	7.0	8.0	19,393	21,207	23,455
17U	Pangil River - Upstream	<1	2	2	7.2	7.0	8.0	1,659	1,659	3,676
18	Siniloan River	2	2	1	2.5	2.0	6.0	57,457	50,363	50,363
19	Sta. Maria River - Downstream	1	2	3	4.4	4.0	5.0	7,699	11,040	22,496
19U	Sta. Maria River - Upstream	1	1	<1	8.5	8.0	8.0	1,362	2,121	3,539
20	Jala-jala River									
21	Pililla River	8	8	4	0.2	1.0	0.5	244,693	369,195	311,391
22 A	Tanay River - Brgy. Wawa (Downstream)	12	**	6	0.2	**	1.0	503,631	510,588	1,662,829
22 B	Tanay River - Midstream	<1	<1	2	3.4	3.0	4.0	14,327	11,990	24,917
22 C	Tanay River - Daranak Falls (Upstream)	<1	1	<1	7.6	8.0	8.0	3,808	4,465	3,914
23	Baras River	9	8	12	0.4	4.0	0.4	439,962	227,782	348,809
24	Morong River - Downstream	6	6	6	2.0	1.0	5.3	462,092	462,092	214,484
24U	Morong River - Upstream	***	***	6	***	***	3.4	5,925	4,500	350,000
25	Manggahan Floodway (Taytay)	17	22	14	<0.1	<0.1	<0.1	192,883	187,369	403,674
26	Sapang Baho River (Cainta)	20	23	11	<0.1	<0.1	0.2	3,337,946	4,620,919	5,945,903
27	Angono River	11	7	6	0.8	1.0	2.6	441,454	330,000	639,361
28	Teresa River	2	2	3	5.0	4.0	6.1	78,000	92,479	367,630
29	Saran River	*	*	*	*	*	*	16,043,690	7,800,000	*
30	Binangonan River	36	41	18	<0.1	<0.1	3.1	10,964,625	20,231,477	17,063,889

Station	Monitoring Stations	Water Quality Parameters								
		pH (units)			Ammonia (mg/L)			Nitrate (mg/L)		
		Apr	May	Jun	Apr	May	Jun	Apr	May	Jun
1	Marikina River	7.4	7.4	7.3	11.00	7.00	8.00	<0.1	<0.1	<0.1
2	Bagumbayan River (Taguig)	7.3	6.6	6.7	32.00	25.00	25.00	<0.1	<0.1	<0.1
3	Buli Creek	7.3	7.3	7.3	25.00	23.00	27.00	<0.1	<0.1	0.10
4	Mangangate River (Muntinlupa) -Downstream	7.6	7.4	7.5	22.00	13.00	21.00	<0.1	<0.1	<0.1
5	Tunasan River (Muntinlupa) -Downstream	7.7	7.5	7.2	11.00	11.00	10.00	<0.1	<0.1	0.30
6	San Pedro River (T <sub>2</sub> )	7.9	7.7	7.6	9.00	8.00	8.00	0.30	0.20	0.20
7	Biñan River	7.8	7.5	7.6	13.00	8.00	12.00	<0.1	<0.1	<0.1
8	Sta. Rosa River - Downstream	7.7	7.8	7.9	3.00	4.00	1.00	<0.1	<0.1	<0.1
8M	Sta. Rosa River - Midstream	7.7	8.4	7.7	2.00	2.00	2.00	<0.1	<0.1	<0.1
8U	Sta. Rosa River - Upstream	8.6	7.8	7.9	2.00	2.00	2.00	1.00	1.00	2.00
9	Cabuyao River	7.5	7.5	7.7	15.00	20.00	9.00	<0.1	<0.1	0.20
10	San Cristobal River (T <sub>3</sub> )	7.3	7.0	7.8	4.00	2.00	1.00	<0.1	<0.1	<0.1
11	San Juan River (T <sub>5</sub> )	7.6	7.6	7.5	0.60	0.40	0.60	5.00	6.00	2.00
12	Molawin Creek (Los Baños)	7.2	7.2	7.2	1.00	1.00	0.10	2.00	<0.1	1.00
13	Bay River (T <sub>5</sub> )	8.0	7.8	7.8	0.08	0.10	0.10	1.00	0.40	1.00
14	Pila River	7.4	7.3	7.2	0.06	0.07	0.09	0.30	<0.1	0.20
15	Sta. Cruz River (T <sub>6</sub> )	7.5	7.4	7.6	0.30	0.10	0.10	1.00	0.70	1.00
16	Pagsanjan River (T <sub>6</sub> )	7.6	7.5	7.5	0.05	0.05	0.04	0.10	0.20	0.40
17	Pangil River - Downstream	7.5	7.6	7.7	0.30	0.08	0.03	0.30	0.10	0.30
17U	Pangil River - Upstream	7.4	7.4	7.6	<0.01	0.02	0.01	<0.1	0.10	0.20
18	Siniloan River	7.0	7.2	7.2	0.02	0.80	0.10	<0.1	0.20	0.50
19	Sta. Maria River - Downstream	7.3	7.5	7.5	0.08	0.08	0.20	0.10	0.20	0.60
19U	Sta. Maria River - Upstream	7.8	7.9	7.9	0.05	0.03	0.02	<0.1	<0.1	0.50
20	Jala-jala River									
21	Pililla River	7.0	7.2	7.1	2.00	<0.01	0.10	<0.1	<0.1	<0.1
22 A	Tanay River - Brgy. Wawa	7.0	**	7.2	0.70	**	0.30	<0.1	**	<0.1
22 B	Tanay River - Midstream	7.0	7.4	7.4	0.02	0.05	0.07	0.40	0.30	1.00
22 C	Tanay River - Daranak Falls	7.8	7.9	8.0	0.02	0.05	0.03	0.40	0.30	1.00
23	Baras River	6.8	7.2	7.1	1.00	0.80	1.00	<0.1	<0.1	<0.1
24	Morong River - Downstream	7.3	7.3	8.0	2.00	0.70	5.00	<0.1	<0.1	1.00
24U	Morong River - Upstream	***	***	7.6	***	***	2.00	***	***	2.00
25	Manggahan Floodway (Taytay)	7.4	7.3	7.2	17.00	15.00	10.00	<0.1	<0.1	<0.1
26	Sapang Baho River (Cainta)	7.5	7.3	7.2	9.00	11.00	7.00	<0.1	<0.1	2.00
27	Angono River	7.5	7.4	7.5	6.00	4.00	4.00	0.90	1.00	1.00
28	Teresa River	8.0	7.8	7.8	0.08	0.02	0.40	0.80	1.00	2.00
29	Saran River	*	*	*	*	*	*	*	*	*
30	Binangonan River	7.4	7.3	7.4	2.00	9.00	4.00	<0.1	<0.1	2.00

\* No sample due to shallow water

\*\* No sample due to prolific water hyacinth

\*\*\* No sample due to prolific water lettuce quaiipo plant





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



## Water Quality Guidelines (WQG) Prescribed in DENR Administrative Order No. 2016-08

### pH




#### Legend:

-  Conformed with WQG for Classes A and B (6.5 to 8.5)
-  Conformed with WQG for Class C (6.5 to 9.0)
-  Conformed with WQG for Class D (6.0 to 9.0)
-  Failed the WQG for Classes A to D (less than 6.0 and more than 9.0)





### BOD

-  Conformed with WQG for Class A (conc. of less than and up to 3 mg/L)
-  Conformed with WQG for Class B (conc. of more than 3 and up to 5 mg/L)
-  Conformed with WQG for Class C (conc. of more than 5 mg/L up to 7 mg/L)
-  Conformed with WQG for Class D (conc. of more than 7 mg/L up to 15 mg/L)
-  Failed the WQG for Classes A to D (more than 15 mg/L)






### DO

-  Conformed with WQG for Classes A, B and C (conc. of equal and more than 5 mg/L)
-  Conformed with WQG for Class D (conc. of more than 2 mg/L up to less than 5 mg/L)
-  Failed the WQG for Classes A to D (less than 2 mg/L)





### Chloride

-  Conformed with WQG for Classes A and B (conc. of less than and up to 250 mg/L)
-  Conformed with WQG for Class C (conc. of more than 250 mg/L and up to 350 mg/L)
-  Conformed with WQG for Class D (conc. of more than 350 mg/L and up to 400 mg/L)
-  Failed the WQG for Classes A to D (more than 400 mg/L)




### TSS

-  Conformed with WQG for Class A (conc. of less than and up to 50 mg/L)
-  Conformed with WQG for Class B (conc. of more than 50 mg/L and up to 65 mg/L)
-  Conformed with WQG for Class B (conc. of more than 65 mg/L and up to 80 mg/L)
-  Conformed with WQG for Class B (conc. of more than 80 mg/L and up to 110 mg/L)
-  Failed the WQG for Classes A to D (more than 110 mg/L)

### Oil and Grease




-  Conformed with WQG for Classes A and B (conc. of less than and up to 1 mg/L)
-  Conformed with WQG for Class C (conc. of more than 1 mg/L and up to 2 mg/L)
-  Conformed with WQG for Class D (conc. of more than 2 mg/L and up to 5 mg/L)
-  Failed the WQG for Classes A to D (more than 5 mg/L)

### Nitrate




-  Conformed with WQG for Classes A, B and C (conc. of less than and up to 7 mg/L)
-  Conformed with WQG for Class D (conc. of more than 7 mg/L and up to 15 mg/L)
-  Failed the WQG for Classes A to D (more than 15 mg/L)

## Water Quality Guidelines (WQG) Prescribed in DENR Administrative Order No. 2021-19






### Ammonia

-  Conformed with WQG for Classes A, B and C (conc. of less than and up to 0.06 mg/L)
-  Conformed with WQG for Class D (conc. of more than 0.06 mg/L and up to 0.3 mg/L)
-  Failed the WQG for Classes A to D (more than 0.3 mg/L)

### Phosphate

-  Conformed with WQG for Classes A, B and C (conc. of less than and up to 0.025 mg/L)
-  Conformed with WQG for Class D (conc. of more than 0.025 mg/L and up to 0.05 mg/L)
-  Failed the WQG for Classes A to D (more than 0.05 mg/L)

### Fecal Coliform

-  Conformed with WQG for Class A (< 50 MPN/ 100 mL)
-  Conformed with WQG for Class B (more than 50 MPN/ 100 mL and up to 100 MPN/ 100 mL)
-  Conformed with WQG for Class C (more than 100 MPN/ 100 mL and up to 200 MPN/ 100 mL)
-  Conformed with WQG for Class D (more than 200 MPN/ 100 mL and up to 400 MPN/ 100 mL)
-  Failed the WQG for Classes A to D (more than 400 MPN/ 100 mL)

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## FINDINGS FOR THE 2<sup>nd</sup> QUARTER 2024

No water samples were collected in Laguna Lake Stns. V (Northern West Bay) and XIII (Taytay) in April. The water in the said stations was too shallow at the time of sampling, hence, inaccessible for the boat.

For the tributary rivers, no water samples were collected in the following stations:

Stn. 22A (Tanay River – Downstream) in May – Due to abundant water hyacinth

Stn. 24U (Morong River – Upstream) in April and May – Because of the proliferation of water lettuce “quiapo”

Stn. 29 (Saran River) from April to June – The water level was too shallow

### Biochemical Oxygen Demand (BOD)

#### Laguna Lake

- All lake stations conformed with the DENR Water Quality Guideline (WQG) set for Class A to Class C from April to June. Out of the fifteen (15) lake monitoring stations, five (5) were consistently assessed as Class A, specifically; Stns. VIII, XV, XVI, XX, and XXII.
- The BOD concentrations ranged from 1 mg/L to 7 mg/L wherein the highest was observed in Stn. XIII (Taytay) in May and Stns. IV (Central Bay) and XXI (Cardona) in June while the lowest recorded in Stns. II (East Bay) and VIII (South Bay) in April. *The lower the value of the BOD, the better is the quality of the water.*

#### Tributary Rivers

- Out of thirty-six (36) monitored tributary river stations, the following were consistently assessed as:
  - Class A - Twelve (12) stations, namely; Stns. 13, 14, 15, 16, 17, 17U, 18, 19, 19U, 22B, 22C, and 28.
  - Class C - Only Stn. 24 (Morong River – Downstream)
  - Class D - Stn. 6 (San Pedro River) and Stn. 23 (Baras River)
  - Failed the WQG for Classes A to D - Ten (10) stations, specifically; 1, 2, 3, 4, 5, 7, 8, 8M, 9, and 30.
- The monthly BOD concentrations ranged from <1 mg/L to 304 mg/L. The highest value was noted in Stn. 2 (Bagumbayan River - Taguig) which was also found to be highest in BOD from April to June. The lowest BOD value was recorded in the following:
  - Stn. 16 (Pagsanjan River) in May
  - Stns. 17 (Pangil River-Downstream) and 19U (Sta. Maria-Upstream) in June
  - Stn. 17U (Pangil River-Upstream) in April
  - Stn. 22B (Tanay River-Midstream) in April and May
  - Stn. 22C (Tanay River-Upstream) in April and June

- High BOD level indicates excessive pollution and this is commonly observed in stations along the highly industrialized and urbanized areas in the western part of the lake.

## Dissolved Oxygen (DO)

### Laguna Lake

- All fifteen (15) lake monitoring stations passed the WQG for Classes A, B, and C from April to June with DO concentrations ranging from 5 mg/L to 13 mg/L.
- The highest and lowest DO concentrations occurred in June in Stns. XXI (Cardona) and II (East Bay), respectively.

### Tributary Rivers

- The following tributary river stations consistently conformed with the WQG for:
  - Classes A, B, and C – Seven (7) stations, specifically; 8U, 11, 16, 17, 17U, 19U, and 22C.
  - Class D – Only Stn. 22B (Tanay River – Midstream)
  - Failed the WQG for Classes A to D – Twelve (12) stations, specifically; 1, 2, 3, 4, 5, 7, 8, 8M, 10, 21, 25 and 26.
- The DO levels ranged from <0.1 mg/L to 8.5 mg/L with Stn. 19U (Sta. Maria River – Upstream) had the highest DO concentration exhibiting good water condition in terms of DO. Conversely, the lowest was often recorded in stations along the West Bay area. *For DO, the higher the value, the better is the quality of the water.*

## Fecal Coliform

### Laguna Lake

- All lake monitoring stations consistently complied with the WQG set for Class C and higher except for two (2) stations that failed to conform with fecal coliform counts allowable for Class C waters in both May and June, namely; Stns. XIII (Taytay) and XX (GEMS).
- The fecal coliform counts expressed in geomean ranged from 19 MPN/100 mL to 1,742 MPN/100 mL and was both observed in June in Stns. IV (Central Bay) and XXI (Cardona) and in Stn. XIII (Taytay), respectively.

### Tributary Rivers

- All monitored tributary rivers stations failed to meet the WQG set for fecal coliform.
- The highest geomean counts was at 29,071,563 MPN/100mL noted in Stn. 4 (Mangangate River – Downstream) in June while the lowest at 1,362 MPN/100mL was observed in Stn. 19U (Sta. Maria River – Upstream) in April.

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## Chloride

### *Laguna Lake*

- All lake monitoring stations conformed with the WQG set for Classes A and B in April.
- The lake has shown good water quality over the last three (3) years in terms of chloride concentration as it continuously complied with the water classification for Classes A and B as there was no record of salt water intrusion in 2021 to 2023 which generally occurs in the summer months. However, in the 2nd quarter of 2024, salt water intrusion in the lake was evident as shown by the results in chloride. Thus, the following stations were consistently assessed as:
  - Classes A and B – Seven (7) stations namely; Stns. II, IV, VIII, XVII, XVIII, XXII, and XXIII
- Stns. I, V and XIII failed the WQG for Classes A to D in May and June.
- The chloride concentration ranged from 10 mg/L to 4,800 mg/L. The highest was detected in Stn. XX (GEMS) in June while the lowest was in Stns. XVI (Sta. Rosa – West Bay) and XXIII (Lumban) in May.
- Stations located in the upper portion of the West Bay side of the lake failed the WQG at least once this quarter possibly because these are the nearest monitoring stations from the Pasig River and are therefore the most affected when salt water intrusion occurs.

## pH

### *Laguna Lake*

- There were sporadic assessments of Classes A, B, and C for pH among the stations. The saltwater intrusion increased the chloride concentrations in the lake, which led to increase in water clarity and finally increase in algal growth because of photosynthetic activity. Algae consume carbon dioxide during photosynthesis, and this consumption is responsible for an increase in pH.  
(<https://onlinelibrary.wiley.com/doi/10.1002/9781118981771.ch13>)
- The pH levels in the lake monitoring stations ranged from 7.5 to 9.6 which were both recorded in June in Stn. XXIII (Lumban) and in Stn. XXI (Cardona), respectively.

### *Tributary Rivers*

- All monthly monitoring stations in the tributary rivers conformed with Classes A and B except for Stn. 8U in April which was assessed as Class C.
- The pH readings ranged from 6.6 to 8.6 wherein the lowest was observed in Stn. 2 (Bagumbayan River) in May and the highest was in Stn. 8U (Sta. Rosa River – Upstream) in April.

## Ammonia

### Laguna Lake

- From April to June, seven (7) lake stations consistently conformed with Classes A to C, namely: Stns. IV, VIII, XV, XVII, XVIII, XXII, and XXIII.
- The following stations conformed with the WQG for Class D as set for Ammonia: Stns. I, II, and XXI in April; Stn. V in May; and Stns. I, II, V, XVI, XIX, and XX in June.
- Stn. XIII (Taytay) in May was the only station that failed to conform with the WQG for Classes A to D with the highest concentration of 0.90 mg/L while the lowest was recorded in Stn. IV (Central Bay) in May with a concentration of <0.1 mg/L.

### Tributary Rivers

- The following stations were constantly assessed as:
  - Classes A, B, and C – Four (4) stations: Stns. 16, 17U, 19U, and 22C.
  - Class D - Three (3) stations: Stns. 13, 15 and 19
  - Failed the WQG – Nineteen (19): Stns. 1, 2, 3, 4, 5, 6, 7, 8, 8M, 8U, 9, 10, 11, 23, 24, 25, 26, 27, and 30.
- The other stations had sporadic assessments of passing and failing the WQG set for Class C.
- The ammonia concentrations ranged from <0.01 mg/L to 32 mg/L. The highest was recorded in Stn. 2 (Bagumbayan River) in April while the lowest was noted in Stns. 17U (Pangil River – Downstream) in April and 21 (Pililla River) in May.

## Nitrate

### Laguna Lake

- The concentration of nitrate ranged from <0.1 mg/L to 0.7 mg/L for three consecutive months, hence, all monitored lake stations conformed with the WQG for Classes A, B and C.

### Tributary Rivers

- All monitored tributary river stations conformed with the WQG set for Classes A, B, and C.
- The monthly nitrate concentrations ranged from <0.1 mg/L to 6 mg/L. Stn. 11 (San Juan River) consistently recorded the highest nitrate levels in April to June.

## Inorganic Phosphate

### Laguna Lake

- All monthly concentrations for inorganic phosphate failed to conform with the WQG set for C waters except for Stn. XXI (Cardona) which had the lowest concentration of 0.025 mg/L in June and conformed with Classes A, B and C.



- The highest concentration at 0.320 mg/L was registered in Stn. XIII (Taytay) in May.

#### ***Tributary Rivers***

- All monitored tributaries failed to comply with the WQG for Classes A, B, and C except for Stn. 22B (Tanay River – Midstream) which was always assessed as Class D in April to June, and Stn. 22C (Tanay River – Upstream) was at Classes A, B and C in April and May and Class D in June.

#### **Total Suspended Solids**

#### ***Laguna Lake***

- All lake stations consistently conformed with the WQG set for Class A waters from April to June except for Stn. XVIII (Pagsanjan – East Bay) which was assessed as Class B in June; Stn. XIX (Muntinlupa) as Class C in April; and Stn. IV (Central Bay) as Class D in April.
- The TSS levels ranged from 9 mg/L to 81 mg/L wherein highest was observed in Stn. IV (Central Bay) in April and the lowest in Stn. XX (GEMS) in June.

#### **Summary/Recommendations:**

Considering the computed averages of the above parameters from April to June 2024, Stn. XVIII (Pagsanjan – East Bay) was observed to have the best water quality among fifteen (15) lake stations as it passed the WQG set for Classes A, B and C for all the parameters except for inorganic phosphate which was at Class D while the rest of the stations failed. Conversely, the worst station that received the most failed averages and worst water quality in terms of fecal coliform, pH, ammonia, and inorganic phosphate for this quarter is Stn. XIII (Taytay). Station XIII is the nearest station to the Pasig River and firstly affected by the Pasig River backflow.

Among the thirty-six (36) monitored tributary rivers, Stn. 22C (Tanay River – Upstream) exhibited the best water quality. It was assessed as Class C and higher for all parameters except for fecal coliform counts where all tributaries failed the WQG. On the other hand, Stn. 2 (Bagumbayan River) had the poorest water quality as it had the highest averages for of BOD, ammonia, and inorganic phosphate.

The river stations in the western part of Laguna de Bay which are highly populated and industrialized areas are always observed to have the poor water condition. Thus, the following are highly recommended to prevent further deterioration of the water quality of the Laguna de Bay and its tributaries:

- 1) Strict implementation of environmental laws and ordinances; provide/ensure treatment for domestic wastes and penalizing the illegal disposal of solid wastes, and industrial wastewaters directly into the lake and rivers;



- 2) Consider proactive environmental strategies with the active participation and involvement of the LGUs, communities and stakeholders; and
- 3) Adopt a comprehensive plan on proper solid waste management such as:
  - > Put up trash traps along shorelines and river banks to control and stop the solid wastes from getting in the lake and rivers
  - > Devise marked garbage bins (Nabubulok/Hindi Nabubulok) in accessible and within reach areas

Prepared by:

  
**GILLIAN G. REYES**


Science Research Specialist I

Reviewed by:

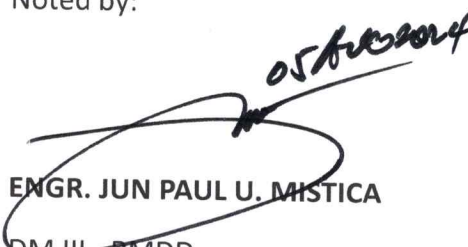
  
**JOEBETH S. DALISAY**

Senior Science Research Specialist

Approved by:

  
**ENGR. JOCELYN G. STA. ANA, CESE**  
DC III - ELRD

Noted by:

  
**ENGR. JUN PAUL U. MISTICA**  
DM III - RMDD