Aqua Link, Inc.
Pond, Lake & Stream Management & Supplies

Lake Management Progress Report
North Lake
Dated 8.30.24

Aqua Link has prepared this project progress report based upon our observations when: 1) collecting data as part of your lake water quality monitoring program and, 2) performing lake treatments in an attempt to control planktonic algae in your lake. The water quality of your lake was monitored on June 27th, July 25th, and August 20th. Your lake was treated with MicroLife Clear Max concentrated bacteria additives on July 25th and August 8th as described below.

Water Quality Data

Aqua Link monitored the water quality of the lake at one station, which is centrally in the deepest section of the lake basin. *Insitu* water quality data were collected using a YSI ProDss multi-probe water quality meter. In addition, water clarity (transparency) was measured using a freshwater Secchi disk. Water samples (surface and bottom) were collected at the designated station and these samples were submitted to the contract laboratories for analysis. All collected phytoplankton samples were preserved and stored, and these samples will be analyzed in the fall/winter and discussed thoroughly in the final report.

Below is a preliminary, brief summary of the collected *insitu* water quality data for June, July and August and data reported by the contract laboratory for June and July:

1. The Secchi disk lake transparency values for June, July, and August were 1.1 meters (3.5 ft.), 1.1 meters (3.5 ft.), and 0.5 meters (1.8 ft.). Secchi disk values less than 1.5 meters are generally consistent with algal bloom conditions in lakes.

2. The lake water column was well mixed and therefore thermally unstratified at the deepest section of the lake, which measured about 20 feet in depth.

3. Dissolved oxygen concentrations were above 5 milligrams per liter (mg/L) at all water depths on all study dates. This indicates that the lake aeration system is working as it should.

4. *Insitu* phycocyanin (PC) data indicate that the highest levels of blue-green planktonic algae (phytoplankton) throughout the lake water column were in July and August. Chlorophyll-a represents all types of algae while phycocyanin is only associated with blue-green algae.

5. The total phosphorus concentrations in surface and bottom lake waters were 0.04 mg/L in June and increased to 0.07 mg/L, respectively. These concentrations are considered high and very high for surface waters. In general, total phosphorus concentrations above 0.03 mg/L in surface waters are indicative of eutrophic lake conditions – highly levels of aquatic productivity.

6. The chlorophyll-a concentration as reported by the contract laboratory was 25 ug/L (micrograms per liter) in both June and July. These concentrations represent eutrophic lake conditions.

7. The August laboratory data were not available at the time when preparing this report. These data will be included in the final water quality report.

Work Performed & Observations

Below are our observations as of August 20, 2024 for North Lake are as follows:

1. In 2023-24, the lake was under contract for biological lake treatments by Clean-Flo. During this period, it is our understanding that this company was contracted to apply concentrated bacteria additives to breakdown organic lake sediments and to improve water clarity by increasing the population of diatoms. Per Clean-Flo, increasing the diatom population would lead to decreased amounts of potentially toxic, blue-green algae. This claim will be evaluated in our final report once all of our collected phytoplankton samples have analyzed.

2. Due to intense algal blooms occurring in the lake in late July and August, Aqua Link was hired to treat the lake with MicroLife Clear Max concentrated bacteria additives. We performed two treatments on July 25th and August 8th. No lake treatments using an algaecide could be performed since the lake association did not have an approved permit to perform these treatments.

3. Overall, many lakes in your region were impacted by blue-green algal blooms due to a very hot summer with higher than normal precipitation occurring mostly as intense storm events. Under such conditions, more nutrients are transported to lakes from their watersheds and higher air temperatures promote higher amounts of algae growth.

4. The water clarity of the lake was significantly impacted by blue-green algal blooms. This was most evident during the months of July and August. This would be expected based upon the high phosphorus concentrations reported for the lake in July. It is anticipated that phosphorus concentration may have increased more during the month of August. This will be confirmed once the August laboratory data become available.

North Lake **Insitu Water Quality Data: 2024**

Date mm:dd:yy	Time hh:mm:ss	Site	Depth m	Temp ° C	DO % Sat	DO mg/L	Cond us/cm	Sp Cond us/cm	pH su	TDS mg/L	Salinity ppt	ORP mV	Chl-a rfu	PC rfu	Depth ft	Temp ° F	Chg Temp ° F
6/27/2024	11:23:40 AM	NL 1 (NORTH LAKE)	0.0	26.0	98.1	7.95	88.0	86.3	7.44	56.0	0.04	153.5	1.1	1.9	0.0	78.8	0.3
6/27/2024	11:24:12 AM	NL 1 (NORTH LAKE)	1.0	25.8	95.5	7.79	87.1	85.9	7.34	56.0	0.04	153.4	1.4	2.3	3.4	78.4	0.1
6/27/2024	11:24:52 AM	NL 1 (NORTH LAKE)	2.0	25.7	91.8	7.49	87.1	86.0	7.27	56.0	0.04	153.3	0.9	1.9	6.6	78.2	0.1
6/27/2024	11:25:17 AM	NL 1 (NORTH LAKE)	3.0	25.6	91.6	7.49	86.8	85.8	7.25	56.0	0.04	152.7	1.4	1.8	9.9	78.1	0.1
6/27/2024	11:25:45 AM	NL 1 (NORTH LAKE)	4.0	25.6	90.7	7.42	86.7	85.8	7.21	56.0	0.04	152.3	1.1	2.1	13.3	78.0	0.1
6/27/2024	11:26:09 AM	NL 1 (NORTH LAKE)	5.0	25.4	87.7	7.19	86.5	85.8	7.17	56.0	0.04	152.9	1.5	1.8	16.4	77.8	0.3
6/27/2024	11:26:48 AM	NL 1 (NORTH LAKE)	6.0	25.1	88.2	7.27	86.0	85.8	7.15	56.0	0.04	127.5	2.3	2.5	19.7	77.2	
7/25/2024	10:41:22 AM	NL 1 (NORTH LAKE)	0.0	25.7	94.1	7.67	78.5	77.5	7.31	50.0	0.04	108.2	0.7	8.6	0.0	78.3	0.0
7/25/2024	10:41:57 AM	NL 1 (NORTH LAKE)	1.0	25.7	92.2	7.52	78.6	77.6	7.27	50.0	0.04	108.4	0.8	10.0	3.3	78.2	0.0
7/25/2024	10:42:13 AM	NL 1 (NORTH LAKE)	2.0	25.7	91.8	7.49	78.6	77.6	7.24	50.0	0.04	109.2	0.9	9.3	6.7	78.2	0.0
7/25/2024	10:42:33 AM	NL 1 (NORTH LAKE)	3.0	25.6	92.3	7.53	78.5	77.5	7.25	50.0	0.04	108.1	0.9	9.5	9.9	78.2	0.0
7/25/2024	10:42:50 AM	NL 1 (NORTH LAKE)	4.0	25.6	94.0	7.68	78.5	77.5	7.28	50.0	0.04	106.7	0.8	9.7	13.3	78.1	0.0
7/25/2024	10:43:32 AM	NL 1 (NORTH LAKE)	5.1	25.6	90.9	7.43	78.4	77.6	7.25	50.0	0.04	107.1	0.8	8.6	16.6	78.0	0.0
7/25/2024	10:43:54 AM	NL 1 (NORTH LAKE)	6.0	25.5	90.7	7.42	78.6	77.8	6.96	51.0	0.04	-13.8	2.1	8.5	19.7	78.0	
8/20/2024	12:57:18 PM	NL 1 (NORTH LAKE)	0.0	22.5	100.9	8.97	72.6	75.7	7.23	49.0	0.03	174.9	0.7	10.3	0.0	72.5	-0.3
8/20/2024	12:57:54 PM	NL 1 (NORTH LAKE)	1.0	22.9	87.0	7.49	72.6	75.7	7.06	49.0	0.03	175.0	0.8	10.4	3.4	73.1	0.0
8/20/2024	12:58:13 PM	NL 1 (NORTH LAKE)	2.0	22.8	80.6	6.94	72.7	75.8	6.99	49.0	0.03	176.2	0.9	9.2	6.7	73.1	0.1
8/20/2024	12:58:51 PM	NL 1 (NORTH LAKE)	3.0	22.8	74.3	6.40	72.6	75.8	6.89	49.0	0.03	175.6	0.7	8.4	9.9	73.0	0.2
8/20/2024	12:59:18 PM	NL 1 (NORTH LAKE)	4.0	22.6	70.4	6.08	72.4	75.9	6.82	49.0	0.03	176.2	0.5	6.8	13.1	72.7	0.3
8/20/2024	12:59:56 PM	NL 1 (NORTH LAKE)	5.0	22.3	72.1	6.26	72.0	75.9	6.74	49.0	0.03	177.9	0.6	7.9	16.5	72.1	0.0
8/20/2024	1:00:23 PM	NL 1 (NORTH LAKE)	6.0	22.3	70.9	6.17	72.1	76.1	6.72	49.0	0.03	177.5	0.7	8.2	19.8	72.1	

REPORT OF ANALYSIS

COMPANY	Aqua-Link	REPORT DATE	07/24/24
ADDRESS	P.O. Box 605	JOB # 2111	LOT # 9379
CITY	Doylestown STATE PA ZIP 18901	PO # Verbal	INVOICE # 224438
TO ATTN. OF	Mr. Ed Molesky	SAMPLE DATE	06/27/24
		LAB CERTIFICATION #	18630

CLIENT SAMPLE ID North Lake – NL1S

ECM, Inc. SAMPLE # 71181

Test Parameter	Method # *	Analysis Date & Time	Dilution Factor	MDL (mg/L)	Result (mg/L)
Chlorophyll a (mg/M^3)	10200H 1&2	06/28/24; 1454	3.33	1.0	25
Phaeophytin (mg/M^3)	10200H 1&2	06/28/24; 1454	3.33	1.0	3.3
Soluble Reactive Phosphate-P	4500-P E	06/28/24; 1430	1	0.001	0.001
Total Phosphate-P	4500-P B5&E	07/23/24; 1041	1	0.01	0.04
Total Suspended Solids	2540D	07/03/24; 0900	1	2	12

* Standard Methods for the Examination of Water and Wastewater/USEPA 600-4/79-02

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COMPANY	Aqua-Link	REPORT DATE	07/24/24
ADDRESS	P.O. Box 605	JOB # 2111	LOT # 9379
CITY	Doylestown STATE PA ZIP 18901	PO # Verbal	INVOICE # 224438
TO ATTN. OF	Mr. Ed Molesky	SAMPLE DATE	06/27/24
		LAB CERTIFICATION #	18630

CLIENT SAMPLE ID North Lake – NL1B

ECM, Inc. SAMPLE # 71182

Test Parameter	Method # *	Analysis Date & Time	Dilution Factor	MDL (mg/L)	Result (mg/L)
Soluble Reactive Phosphate-P	4500-P E	06/28/24; 1430	1	0.001	0.002
Total Phosphate-P	4500-P B5&E	07/23/24; 1041	1	0.01	0.04
Total Suspended Solids	2540D	07/03/24; 0900	1	2	14

* Standard Methods for the Examination of Water and Wastewater/USEPA 600-4/79-02

REPORT OF ANALYSIS

COMPANY	Aqua-Link	REPORT DATE	08/28/24
ADDRESS	P.O. Box 605	JOB # 2111	LOT # 9454
CITY	Doylestown STATE PA ZIP 18901	PO # Verbal	INVOICE # 224534
TO ATTN. OF	Mr. Ed Molesky	SAMPLE DATE	07/25/24
		LAB CERTIFICATION #	18630

CLIENT SAMPLE ID North Lake – NL1S

ECM, Inc. SAMPLE # 71511

Test Parameter	Method # *	Analysis Date & Time	Dilution Factor	MDL (mg/L)	Result (mg/L)
Chlorophyll a (mg/M^3)	10200H 1&2	07/26/24; 1540	2	0.6	25
Phaeophytin (mg/M^3)	10200H 1&2	07/26/24; 1540	2	0.6	7.0
Soluble Reactive Phosphate-P	4500-P E	07/26/24; 1606	1	0.001	0.001
Total Phosphate-P	4500-P B5&E	08/21/24; 0915	1	0.01	0.07
Total Suspended Solids	2540D	08/01/24; 0900	1	2	12

* Standard Methods for the Examination of Water and Wastewater/USEPA 600-4/79-02

REPORT OF ANALYSIS

COMPANY Aqua-Link
ADDRESS P.O. Box 605
CITY Doylestown STATE PA ZIP 18901
TO ATTN. OF Mr. Ed Molesky

REPORT DATE 08/28/24
JOB # 2111 LOT # 9454
PO # Verbal INVOICE # 224534
SAMPLE DATE 07/25/24
LAB CERTIFICATION # 18630

CLIENT SAMPLE ID North Lake – NL1B

ECM, Inc. SAMPLE # 71512

Test Parameter	Method # *	Analysis Date & Time	Dilution Factor	MDL (mg/L)	Result (mg/L)
Soluble Reactive Phosphate-P	4500-P E	07/26/24; 1606	1	0.001	0.002
Total Phosphate-P	4500-P B5&E	08/21/24; 0915	1	0.01	0.07
Total Suspended Solids	2540D	08/01/24; 0900	1.11	2	14

* Standard Methods for the Examination of Water and Wastewater/USEPA 600-4/79-02