AQUATIC CONSULTING & TESTING, INC.

1525 W. University Drive, Suite 106
P.O. Box 1510
Tempe, Arizona 85281
Phone: (480) 921-8044 • Fax: (480) 921-0049

Lic. No. AZ0003

09 September 2023

Ms. Fran Pawlak, Executive Director
Dobson Ranch HOA
2719 South Reyes
Mesa, Arizona 85202

August 2023 Lake Report

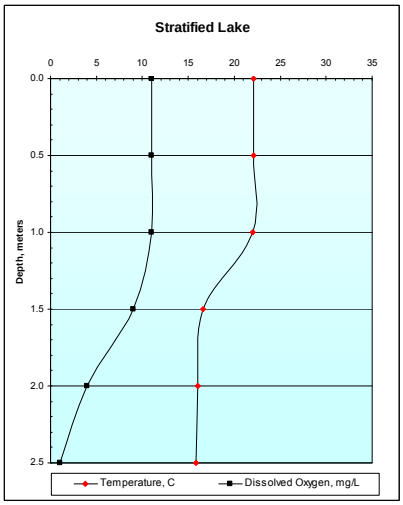
The following report presents the results of field inspections on the Dobson Ranch lakes for the month of August 2023. This report summarizes data collected under the updated program started in 2019 and expanded in 2020 that includes comprehensive testing of one-half of the lakes on a monthly basis from March through October and bi-weekly field inspections twice per month throughout the year. Comprehensive testing on Lakes 1-4 was completed during the month and laboratory reports are provided. Comparison to the last comprehensive test (June 2023) are provided for those lakes. Field sheets for the inspection weeks are also included. Additional data requested for Lake 8 are provided at the end of the narrative report.

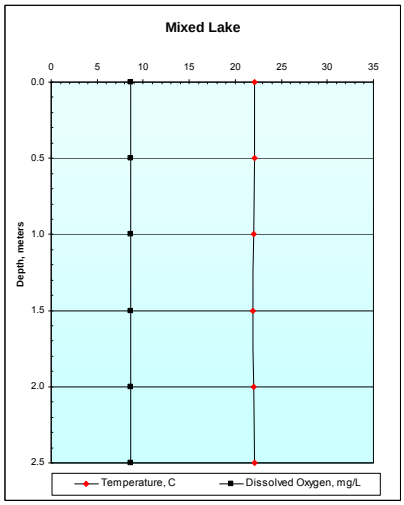
A number of tools have been used to evaluate and quantify the water quality of each lake. These include: Arizona Department of Environmental Quality Numeric Targets for Urban Lakes, the Carlson Trophic Status Index (TSI), and a Lake Report Card based on that used by Arizona Game and Fish Department that was developed by Aquatic Consulting & Testing, Inc.

The following provides brief descriptions of some of the more important parameters.

<u>Temperature and Oxygen</u>

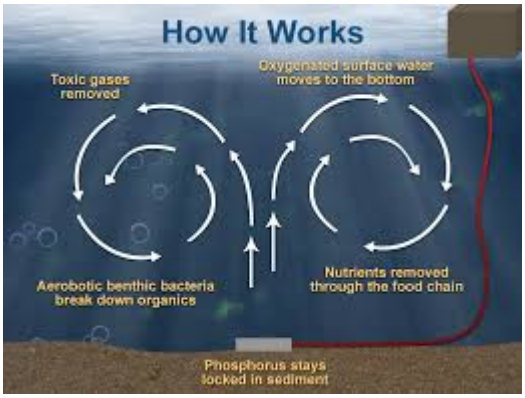
Density differences in water caused by temperature produce a physical barrier to the exchange of gases and nutrients between water layers. Typically warmer (less dense) water rests above deeper, cooler (more dense) water. Deep waters can become anoxic (oxygen poor) and cause the formation and release of





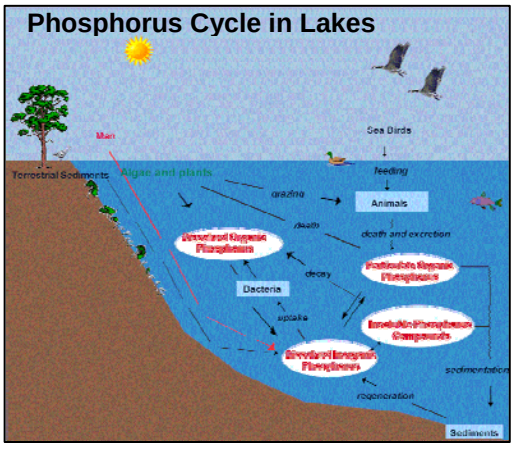
toxic gases as hydrogen sulfide and ammonia, and the release of plant nutrients as phosphates. A vertically mixed lake rarely suffers from such issues.

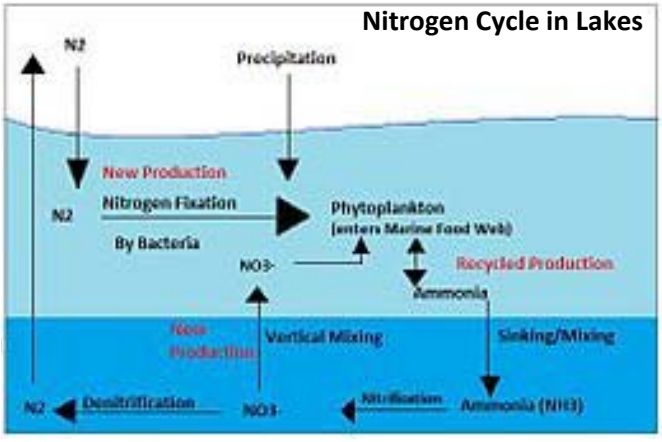
Aeration systems are designed to circulate and distribute oxygen vertically in the water column. Circulation is necessary for two primary purposes: (1) to deliver oxygen to the deeper waters for fish survival and (2) to maintain an aerobic environment throughout the lake to prevent the release and distribution of phosphates, ammonia, and sulfide from the anaerobic sediment.



Nutrients

Algae are plants and require nitrogen and phosphorus for growth. In the desert southwest, large growths of planktonic algae typically form in the summer when total phosphorus concentrations are above 0.030 mg/L. Nitrogen values usually need to be at least 10 times that of phosphorus and in a soluble, usable (nitrate or ammonia) form to stimulate algae growth. Phosphorus and nitrogen cycles in the aquatic environment are illustrated below.





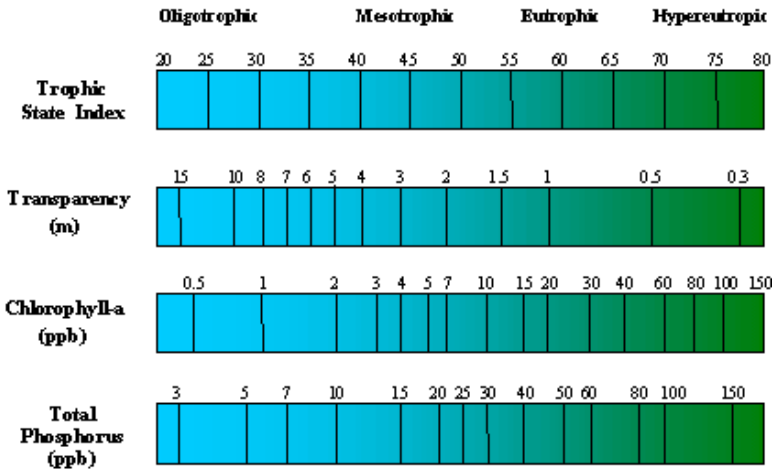
Algae and Aquatic Weeds

Algae are beneficial to a lake as they provide food for aquatic organisms and produce oxygen. However, some algae are undesirable and an overabundance of algae reduces aesthetic appeal and interferes with the ecological balance of the environment. Large die offs of algae can deplete dissolved oxygen in the water via bacterial utilization of the gas during decomposition of the plant biomass. Blue-green (Cyanophyta) algae are least desirable because some forms can form stringers (long filaments) and large colonies (masses) and are difficult to chemically manage because of their mucilaginous coatings.

Submerged weeds can be beneficial because they also produce oxygen and provide habitat and shelter for aquatic animals. However, an overabundance of weeds reduces aesthetic appeal, interferes with fishing and boating activities, interferes with the ecological balance of the environment, and can also deplete dissolved oxygen if a rapid die-off occurs.

Trophic Status Index

The Carlson Trophic Status Index (TSI) is a series of calculations that attempt to put a numerical value on water quality. The more algae and greener a lake is, the more nutrients a lake has, and the less transparent the water becomes, the higher the trophic status and the greater the TSI value. Three values are calculated using the Secchi disk depth, total phosphorus concentration, and chlorophyll measurement to obtain an average TSI. Those lakes with relatively low TSI values are unproductive and termed oligotrophic. Those lakes with very high TSI values are classified as productive (eutrophic). Those lakes with TSI values falling in between are considered mesotrophic.



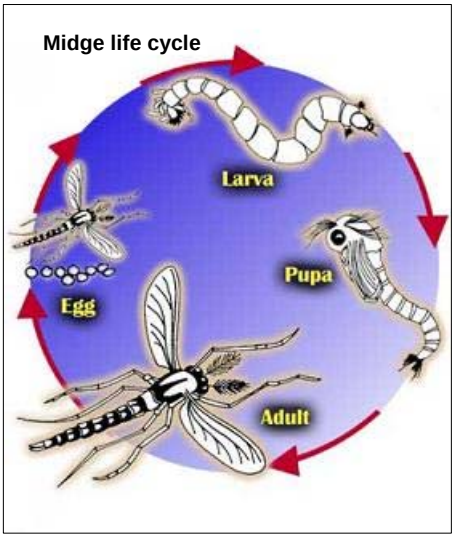
The Trophic Status report addendum provides each of these values for the sampling sites. For southern Arizona, a TSI of less than 60 is the target for reasonable aesthetic quality. Fisheries often flourish when TSI values are in the 55 to 65 range. Severe aesthetic and recreational problems occur when conditions result in TSI values of 80 or higher.

General Characteristics of Oligotrophic and Eutrophic Lakes

Condition	Oligotrophic	Eutrophic
Productivity	Low	High
Algae density	Low	High
Nutrient concentrations	Low	High
Hypolimnion oxygen content	High	Low
Sediment nutrient release	Low to none	High
Organic matter	Low	High
Light transparency	Deep	Shallow
Macrophyte (weed) density	Low	High

Midge flies

Midge flies are common inhabitants of most lakes. Adult females lay hundreds of eggs on the water surface. The eggs settle to the lake bottom and hatch in a few days. Larvae develop and grow in the superficial sediments over a three to four week period. In about 30 days the insect larvae become pupae, rise in the water column, and emerge as adult flies. The adults tend to swarm at dusk and dawn and become a nuisance. They fly into residents' eyes and mouths, congregate under eaves of houses, and leave a sticky messy residue when they die. Management techniques may include stocking of bottom-feeding fishes and application of bacterial or chemical larvicides. The primary control of midge flies has been stocking of fish that eat the larvae living in the lake sediment.




Adult midge

Waterfowl

The adverse impacts of excessive waterfowl include fecal matter deposition and public health issues, turf destruction, aesthetic detraction, and fish consumption. The Arizona Game and Fish Department has recently adopted the following classification for ducks counts (per acre) in urban fishing lakes: <3 (excellent), 3-4 (good), 5-6 (fair), and >6 (poor; relocate non-migratory).

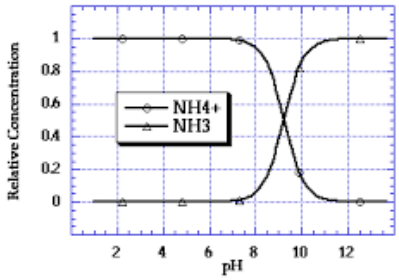
August 2023 Report Narrative Summary

The following pages provide a summary of the monthly survey results. Comprehensive analyses were conducted on Lakes 5-8 on 03 August 2023. A brief narrative description is provided for each lake. Data are additionally qualified in the Lake Report Card (See Supporting Documentation). Lakes 1-8 received visual examination and basic water quality testing on 03 and 17 August 2023.

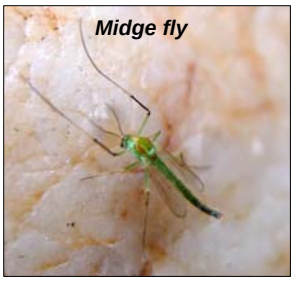
Lakes 5-8

Lake 5

Lake 5 exhibited no thermal stratification and no significant loss of oxygen in the deep waters (see attached profiles). The surface dissolved oxygen concentration (4.5-5.2 mg/L) was slightly below the target 6.0 mg/L concentration desired to protect the fishery; however, no fish stress was observed. Water pH was moderate at 8.1 to 8.4 SU and indicated a low to moderate suspended algae density. Low pH is advantageous because it prevents conversion of ammonium ions (NH_4^+) to toxic (to aquatic animals) ammonia (NH_3) gas (see figure below). Transparency (Secchi disk depth) increased to 1.22 m (4.0 ft) and turbidity remained low at 4.5-6.8 NTU.



Alkalinity (146 mg/L as $CaCO_3$) and hardness (108 mg/L as $CaCO_3$) were very stable. Values are typical and expected from most waters in central Arizona. The total dissolved solids (mineral) concentration of the lake decreased, and remained acceptable at 692 mg/L.

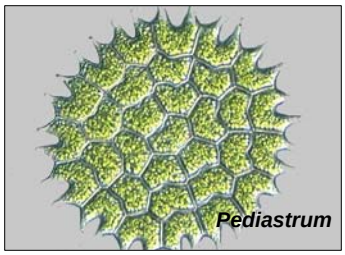


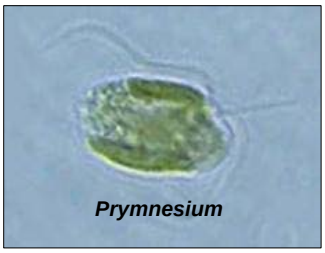
Waterfowl density ranged from four (4) to five (5) birds per acre which is considered in the range of good to fair (Arizona Game & Fish Department rating system). No cormorants were observed.

Midge fly density was remained low (<40/m^2) and should produce no issues to lakeside residents or visitors.

Bio-available nitrogen and total nitrogen decreased slightly to 0.17 mg/L and 1.37 mg/L, respectively. Phosphorus concentration decreased to 0.019 mg/L. Ammonia was minimal at 0.08 mg/L. At ambient temperature and pH, no toxicity issues would result. Chlorophyll concentration, indicative of algal biomass, was stable at 1.74 ug/L. Algae density was correspondingly low (2.13 x 10^3 cells/mL). The dominant alga was

Pediastrum (Chlorophyta colony). It is rarely problematic. The golden alga, *Prymnesium parvum*, was not observed. *P. parvum* can produce a toxin that destroys exposed cells in the gill tissue of fish, causing asphyxiation and death. No submerged weeds were observed.





The mean TSI value decreased from 55 to 47 (range 36-57), with the lake moving into the mesotrophic category. Decreased phosphorus and increased transparency were the responsible factors for the TSI decrease.

The *E. coli* concentration was 15 MPN/100 mL. The maximum bacteria level for full body contact (FBC=swimming) and partial body contact (PBC=fishing and boating) recreation, is 126/100 mL (30-day geometric mean). The single sample maxima are 235 and 575 for FBC and PBC recreation (Dec 2022).

The Lake Report Card value for August 2023 was 49; up two (2) units from June, and remained in the "good" category. Low phosphorus and good transparency were primary factors for the increased score.

Lake 6

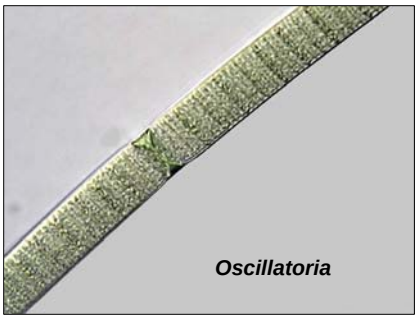
Lake 6 was vertically mixed. No substantial loss of oxygen in the deep waters occurred. (see attached profiles). The surface dissolved oxygen concentrations (6.9 mg/L) were above the target 6.0 mg/L concentration desired to protect the fishery and no fish stress was observed. Water pH was variable and in the range of 8.3-8.5 SU, and indicated a possible reduction in suspended (planktonic) algae density. Low pH is advantageous because it prevents conversion of ammonium ions (NH_4^+) to toxic (to aquatic animals) ammonia (NH_3) gas. Transparency (Secchi disk depth) improved to 0.81 m (2.6 ft) and turbidity ranged from 5.5 to 8.3 NTU.

Alkalinity (149 mg/L as $CaCO_3$) and hardness (103 mg/L as $CaCO_3$) decreased slightly and remained moderate, as would be expected from most waters in central Arizona. The total dissolved solids (mineral) concentration increased slightly to 704 mg/L.

Midge fly density remained quite low (<40/m^2) and should produce no issues to lakeside residents or visitors. Maximum waterfowl density was 3.5-3.6 birds per acre which is considered in the good range (Arizona Game & Fish Department rating system). No cormorants were noted.

Bio-available nitrogen concentration decreased to 0.20 mg/L. Total nitrogen increased slightly to 1.50 mg/L. Phosphorus concentration decreased to 0.032 mg/L; a slightly

elevated value. Ammonia concentration was 0.09 mg/L. At ambient temperature and pH, no toxicity issues would result.



Chlorophyll concentration, indicative of algal biomass, increased to 24.0 ug/L. Algae density increased to 7.32 x 10^4 cells/mL. *Oscillatoria,* a blue-green (Cyanophyta) filament was the dominant form. The alga can cause problems, but none were observed. No potentially-toxic golden algae (*Prymnesium parvum* or related species) were found. *P. parvum* can produce a toxin that destroys exposed cells in the gill tissue of fish, causing asphyxiation and death. No submerged weeds were observed, including horned pondweed (*Zannichellia palustris*) and brittle naiad (*Najas marina*) that have been problematic in other lakes in the past.

The mean TSI value was 60 (range 54-63), maintaining the lake in the slightly-eutrophic category. Slightly eutrophic lakes are more desirable for an urban lake in terms of aesthetics, and reasonably supportive of a robust fishery. They sometimes tend to have dominance of blue-green algae, but this was not the case during the month.

The *E. coli* concentration was 5 MPN/100 mL and met the full body contact (swimming) and partial body contact (fishing and boating) recreation standards.

The Lake Report Card value for August 2023 was 42, a 3 point decrease compared to June 2023 data, and maintaining the lake within the “good” category.

Lake 7

Lake 7 exhibited no thermal stratification (vertically mixed) and had no significant loss of oxygen in the deep waters (see attached profiles). The surface dissolved oxygen concentration (6.8-7.9 mg/L) at all depths met the minimum target of 6.0 mg/L desired to protect the fishery. No fish stress was observed. Water pH ranged from 8.3 to 8.4 SU and reflected a continuing decrease. Low pH is more advantageous because it prevents conversion of ammonium ions (NH_4^+) to toxic (to aquatic animals) ammonia (NH_3) gas. Transparency (Secchi disk depth) decreased to 0.89 m (2.9 ft). Turbidity was moderate (3.2-3.4 NTU) during the month.

Waterfowl density was less than one bird per acre (<1/A) which is considered excellent (Arizona Game & Fish Department rating system). No cormorants were observed.

Midge fly density was low (<40/m^2) and should produce no issues to lakeside residents or visitors.

Alkalinity (163 mg/L as $CaCO_3$) and hardness (131 mg/L as $CaCO_3$) were fairly stable and remained slightly elevated as typical and expected from most waters in central Arizona. The total dissolved solids (mineral) concentration of the lake increased to 968 mg/L.

Bio-available nitrogen concentration decreased to 0.19 mg/L, and total nitrogen increased to 1.39 mg/L. Phosphorus concentration decreased to 0.030 mg/L. The ammonia concentration was 0.09 mg/L and would not create any toxicity issues at ambient temperature and pH.

Chlorophyll concentration, indicative of algal biomass, increased slightly to 16.3 ug/L. Algae density decreased slightly to 6.86 x 10^4 cells/mL. The dominant alga, as with lake 6 was *Oscillatoria,* a blue-green (Cyanophyta) filament form. No significant issues with the alga or other than minor surface scum occurred. Golden algae were absent.

The mean TSI value increased slightly to 58 (range 53-62), with the lake remaining in the slightly-eutrophic category.

The *E. coli* concentration was 214 MPN/100 mL and met partial body contact recreation limits.

The Lake Report Card value for August 2023 was 45, down two units compared to June 2023 and maintaining the lake in the “good” category.

Lake 8

Lake 8 was vertically mixed with little loss of oxygen in the deep water (see attached profiles). The dissolved oxygen concentrations were reduced at 5.4-5.7 mg/L through the water column. Concentrations were satisfactory for the fishery and fish activity appeared normal. Water pH ranged from 8.2-8.7 SU and indicated a low moderate algae density and a significant change in water quality. Water transparency decreased to 1.07 m (3.5 ft). Turbidity was low at 3.9 to 4.7 NTU.

Waterfowl density was 5.2 birds per acre which is considered fair by the Arizona Game & Fish Department rating system. No cormorants were noted. Midge fly density was quite low (<40/m^2) and should produce no issues to lakeside residents or visitors.

Bio-available nitrogen concentrations decreased to 0.19 mg/L, while total nitrogen was stable at 1.29 mg/L. Phosphorus concentration was stable at 0.038 mg/L. The ammonia concentration remained low (0.08 mg/L). At ambient pH and temperature, acute or chronic ammonia toxicity to fish would not occur.

Algae density decreased to 2.14 x 10^2 cells/mL. The dominant alga was *Aphanocapsa*. These algae can cause surface scum and turbidity, but this was not the case a water clarity was excellent. The chlorophyll-a concentration (biomass indicator) increased to 18.7 ug/L; a significant drop. No *Botryococcus* was found. The potentially toxic golden alga (*Prymnesium parvum*) was not present during the month.

The mean TSI value increased eight (8) units to 58 (range 57-59) and moving the lake into the slightly eutrophic category.

The *E. coli* concentrations were <1 and 18 MPN/100 mL. The measurements met the bacteria maximum for partial body contact recreation (fishing and boating).

The Lake Report Card value for August 2023 was 44, a two-unit decrease from June, and kept the lake within the "good" category.

Lakes 1-4

Lake 1

The Lake 1 temperature remained moderate and ranged from 30.6 C to 32.4 C (87-90 F). Water pH was 7.9-8.3 SU indicating low to moderate algae density. Dissolved oxygen (5.7-7.1 mg/L) was satisfactory for the fishery and fish activity appeared normal. Decreases in dissolved oxygen concentration often occur during the summer because of increased respiration and decomposition rates at higher temperatures and the inability of warm water to hold more dissolved oxygen than cold water. Transparency was over one meter and turbidity ranged from 2.4 to 3.1 NTU. Fountains were in service throughout the reporting period.

Waterfowl mean density was just over one per acre which is considered excellent (Arizona Game & Fish Department rating system shown below). No cormorants were noted. Adult midge flies did not appear to produce any nuisance issues to lakeside residents or visitors.

Waterfowl Density Ranking System (AZG&FD)

No. waterfowl per acre	Ranking
<3	Excellent
3-4	Good
5-6	Fair
>6	Poor

No abnormal algae growths or submerged weeds were observed. The green colony, *Pediastrum* dominated the phytoplankton. No golden algae (*Prymnesium parvum* or related species) were detected.

Lake 2

The water temperature of Lake 2 was 31.5-32.8 C (89-91 F). Water pH was 8.2 SU indicating probable decreasing algae density. Dissolved oxygen (5.7-7.2 mg/L) was satisfactory for the fishery and fish activity appeared normal. Transparency was approximately one meter and turbidity was typical at 5.7-5.9 NTU. The fountain was not in service at the beginning of the reporting period.

Two (2) birds per acre were observed and the density is considered excellent for an urban lake. Adult midge flies did not appear to produce any nuisance issues to lakeside residents or visitors.

No abnormal algae growth or submerged weeds were observed. The dominant alga was *Melosira*, a unicellular diatom (Bacillariophyta). The alga is rarely problematic. No golden algae (*Prymnesium parvum* or related species) were detected.

Lake 3

Lake temperature range was 30.6 to 32.8 C (87-91 F). Water pH ranged from 7.6-8.3 SU. Dissolved oxygen concentration ranged from 6.4 to 6.5 mg/L and remained satisfactory for the fishery. Fish activity appeared normal. Transparency was stable at about one meter. Turbidity ranged at 4.6-9.4 NTU. The fountain was operating throughout the reporting period.

Waterfowl density ranged from 2 to 3 birds per acre; "excellent" rating. Minimal cormorants were observed. Decreased numbers of waterfowl was expected outside the migratory season. Adult midge flies did not appear to produce any nuisance issues to lakeside residents or visitors.

No abnormal algae growth or submerged weeds were observed. During August, *Scenedesmus w*as the dominant alga. No golden algae (*Prymnesium parvum* or related species) were detected.

Lake 4

The temperature of Lake 4 ranged from 31.6-33.0 C (89-93 F). Water pH was moderate at 8.2 SU and indicated a low algae density. Dissolved oxygen (6.4-6.9 mg/L) was satisfactory for the fishery and fish activity appeared normal. Transparency was slightly less than one meter and turbidity remained low (4.3-4.4 NTU). Fountains were in operation.

Waterfowl density was about 4 per acre which is considered poor. No cormorant issues were reported. Adult midge flies did not appear to produce any nuisance issues to lakeside residents or visitors.

No abnormal algae growth or submerged weeds were observed. *Pediastrum*, as in Lake 1, was the dominant alga. No golden algae (*Prymnesium parvum* or related species) were detected.

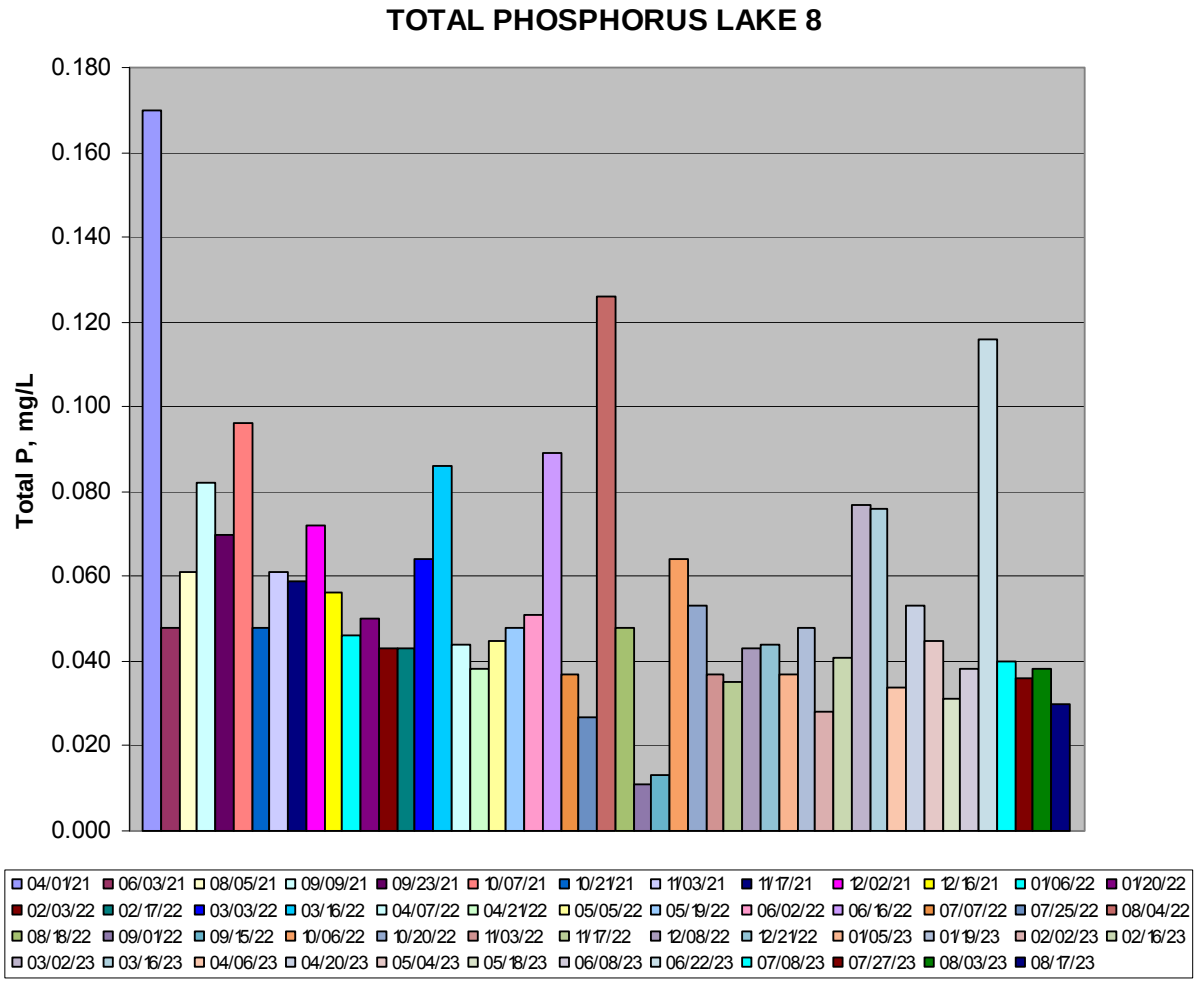
Special Testing

E. coli bacteria and total phosphorus were measured in Lake 8 on two dates during the month. Data are presented below.

Date	*E. coli*, MPN/100 mL)	Phosphorus, mg/L
08/03/23	18	0.038
08/17/23	<1	0.030

The measured bacteria concentrations are below the levels established for partial and full body contact recreation by the State, based on a single-sample maximum.

The phosphorus concentrations in Lake 8 during the recent study period were fairly stable. Noting the Phoslock® application occurred on 29 November 2021, no dramatic reduction in phosphorus is shown in the figure below. However, the impact may be more long-term if it reduces recycling of phosphorus from the sediment. Data collection will be continued.



Next Month:

Lakes 1-4 are scheduled for comprehensive monitoring next month. All lakes will be visually inspected and field data collected two times during the month. Additional monitoring of Lake 8 phosphorus and *E. coli* will continue.

Respectfully:

Aquatic Consulting & Testing, Inc.

Frederick A. Amalfi, Ph.D., C.L.M.

SUPPORTING DOCUMENTATION

- Laboratory reports
- Field Inspection Sheets
- Pesticide application documents

AQUATIC CONSULTING & TESTING, INC.

1525 W. University Drive, Suite 106
P.O. Box 1510
Tempe, Arizona 85281
Phone: (480) 921-8044 • Fax: (480) 921-0049 Lic. No. AZ0003

LABORATORY REPORT

Client: Dobson Ranch Association
2719 South Reyes Road
Mesa, AZ 85202

Date Submitted: 08/03/23
Date Reported: 09/11/23

Attn: Fran Pawlak, Executive Director

Project: Monthly Lake 5-8 Monitoring

RESULTS

Client ID: Lake 1
ACT Lab No.: CF05513

Sample Type: Surface Water
Sample Time: 08/03/23 10:50

Parameter	Analysis Date Start	Analysis Date End	Method No.	Result	Unit
Golden Algae	08/03/23	08/03/23	P/C Microscopy	Absent	Pres/Abs
Oxygen, Dissolved Field	08/03/23	08/03/23	SM4500 O G	5.7	mg/L as O2
pH, Field	08/03/23	08/03/23	SM4500H+ B	8.3	SU
Temperature, Field	08/03/23	08/03/23	SM2550 B	32.4	C
Turbidity	08/03/23	08/03/23	180.1	2.4	NTU

Client ID: Lake 2
ACT Lab No.: CF05514

Sample Type: Surface Water
Sample Time: 08/03/23 10:40

Parameter	Analysis Date Start	Analysis Date End	Method No.	Result	Unit
Golden Algae	08/03/23	08/03/23	P/C Microscopy	Absent	Pres/Abs
Oxygen, Dissolved Field	08/03/23	08/03/23	SM4500 O G	5.7	mg/L as O2
pH, Field	08/03/23	08/03/23	SM4500H+ B	8.2	SU
Temperature, Field	08/03/23	08/03/23	SM2550 B	32.8	C
Turbidity	08/03/23	08/03/23	180.1	5.9	NTU

RESULTS

Client ID: Lake 3
ACT Lab No.: CF05515

Sample Type: Surface Water
Sample Time: 08/03/23 10:20

Parameter	Analysis Date Start	Analysis Date End	Method No.	Result	Unit
Golden Algae	08/03/23	08/03/23	P/C Microscopy	Absent	Pres/Abs
Oxygen, Dissolved Field	08/03/23	08/03/23	SM4500 O G	6.4	mg/L as O2
pH, Field	08/03/23	08/03/23	SM4500H+ B	8.3	SU
Temperature, Field	08/03/23	08/03/23	SM2550 B	32.8	C
Turbidity	08/03/23	08/03/23	180.1	4.6	NTU

Client ID: Lake 4
ACT Lab No.: CF05516

Sample Type: Surface Water
Sample Time: 08/03/23 10:00

Parameter	Analysis Date Start	Analysis Date End	Method No.	Result	Unit
Golden Algae	08/03/23	08/03/23	P/C Microscopy	Absent	Pres/Abs
Oxygen, Dissolved Field	08/03/23	08/03/23	SM4500 O G	6.4	mg/L as O2
pH, Field	08/03/23	08/03/23	SM4500H+ B	8.2	SU
Temperature, Field	08/03/23	08/03/23	SM2550 B	33.0	C
Turbidity	08/03/23	08/03/23	180.1	4.3	NTU

RESULTS

Client ID: Lake 5
ACT Lab No.: CF05517

Sample Type: Surface Water
Sample Time: 08/03/23 09:45

Parameter	Analysis Date Start	Analysis Date End	Method No.	Result	Unit
Algae Count	08/15/23	08/15/23	SM 10200 F	See Attached	cells/mL
Algae Identification	08/15/23	08/15/23		See Attached	
Chl/Pheo Ratio	09/06/23	09/06/23	SM10200 H	1.33	
Chlorophyll a	09/06/23	09/06/23	SM10200 H	1.74	ug/L
Golden Algae	08/03/23	08/03/23	P/C Microscopy	Absent	Pres/Abs
Midge count	08/03/23	08/03/23	SM10500 C	<40	#/sq. meter
Pheophytin a	09/06/23	09/06/23	SM10200 H	1.91	ug/L
Oxygen, Dissolved Field	08/03/23	08/03/23	SM4500 O G	5.2	mg/L as O2
pH, Field	08/03/23	08/03/23	SM4500H+ B	8.4	SU
Secchi Disk Depth	08/03/23	08/03/23	NALMS	1.22	meters
Temperature, Field	08/03/23	08/03/23	SM2550 B	33.4	C
Alkalinity, Total	08/04/23	08/04/23	SM 2320 B	146.	mg/L as CaCO3
Ammonia - N	08/04/23	08/04/23	SM4500NH3 D	0.08	mg/L as N
Nitrate + Nitrite - N	08/20/23	08/20/23	SM4500NO3 E	0.17	mg/L as N
Phosphorus, Total	09/06/23	09/07/23	365.3	0.019	mg/L as P
Total Hardness	08/08/23	08/08/23	SM2340C	108.	mg/L as CaCO3
Total Kjeldahl Nitrogen	08/04/23	08/04/23	SMNorg C,NH3 C/D	1.2	mg/L as N
E. coli, Colilert	08/03/23	08/04/23	SM 9223 B	15	MPN/100 mL
Total Dissolved Solids	08/08/23	08/13/23	SM2540 C	692.	mg/L
Turbidity	08/03/23	08/03/23	180.1	6.8	NTU

RESULTS

Client ID: Lake 6
ACT Lab No.: CF05518

Sample Type: Surface Water
Sample Time: 08/03/23 09:15

Parameter	Analysis Date Start	Analysis Date End	Method No.	Result	Unit
Algae Count	08/15/23	08/15/23	SM 10200 F	See Attached	cells/mL
Algae Identification	08/15/23	08/15/23		See Attached	
Chl/Pheo Ratio	09/06/23	09/06/23	SM10200 H	1.80	
Chlorophyll a	09/06/23	09/06/23	SM10200 H	24.0	ug/L
Golden Algae	08/03/23	08/03/23	P/C Microscopy	Absent	Pres/Abs
Midge count	08/03/23	08/03/23	SM10500 C	40	#/sq. meter
Pheophytin a	09/06/23	09/06/23	SM10200 H	<0.10	ug/L
Oxygen, Dissolved Field	08/03/23	08/03/23	SM4500 O G	6.9	mg/L as O2
pH, Field	08/03/23	08/03/23	SM4500H+ B	8.5	SU
Secchi Disk Depth	08/03/23	08/03/23	NALMS	0.81	meters
Temperature, Field	08/03/23	08/03/23	SM2550 B	33.0	C
Alkalinity, Total	08/04/23	08/04/23	SM 2320 B	149.	mg/L as CaCO3
Ammonia - N	08/04/23	08/04/23	SM4500NH3 D	0.09	mg/L as N
Nitrate + Nitrite - N	08/20/23	08/20/23	SM4500NO3 E	0.20	mg/L as N
Phosphorus, Total	09/06/23	09/07/23	365.3	0.032	mg/L as P
Total Hardness	08/08/23	08/08/23	SM2340C	103.	mg/L as CaCO3
Total Kjeldahl Nitrogen	08/04/23	08/04/23	SMNorg C,NH3 C/D	1.3	mg/L as N
E. coli, Colilert	08/03/23	08/04/23	SM 9223 B	5	MPN/100 mL
Total Dissolved Solids	08/08/23	08/13/23	SM2540 C	704.	mg/L
Turbidity	08/03/23	08/03/23	180.1	8.3	NTU

RESULTS

Client ID: Lake 7
ACT Lab No.: CF05519

Sample Type: Surface Water
Sample Time: 08/03/23 08:45

Parameter	Analysis Date Start	Analysis Date End	Method No.	Result	Unit
Algae Count	08/15/23	08/15/23	SM 10200 F	See Attached	cells/mL
Algae Identification	08/15/23	08/15/23		See Attached	
Chl/Pheo Ratio	09/06/23	09/06/23	SM10200 H	1.63	
Chlorophyll a	09/06/23	09/06/23	SM10200 H	16.3	ug/L
Golden Algae	08/03/23	08/03/23	P/C Microscopy	Absent	Pres/Abs
Midge count	08/03/23	08/03/23	SM10500 C	40	#/sq. meter
Pheophytin a	09/06/23	09/06/23	SM10200 H	1.95	ug/L
Oxygen, Dissolved Field	08/03/23	08/03/23	SM4500 O G	6.8	mg/L as O2
pH, Field	08/03/23	08/03/23	SM4500H+ B	8.4	SU
Secchi Disk Depth	08/03/23	08/03/23	NALMS	0.90	meters
Temperature, Field	08/03/23	08/03/23	SM2550 B	33.0	C
Alkalinity, Total	08/04/23	08/04/23	SM 2320 B	163	mg/L as CaCO3
Ammonia - N	08/04/23	08/04/23	SM4500NH3 D	0.09	mg/L as N
Nitrate + Nitrite - N	08/20/23	08/20/23	SM4500NO3 E	0.19	mg/L as N
Phosphorus, Total	09/06/23	09/07/23	365.3	0.030	mg/L as P
Total Hardness	08/08/23	08/08/23	SM2340C	131.	mg/L as CaCO3
Total Kjeldahl Nitrogen	08/04/23	08/04/23	SMNorg C,NH3 C/D	1.2	mg/L as N
E. coli, Colilert	08/03/23	08/04/23	SM 9223 B	214	MPN/100 mL
Total Dissolved Solids	08/08/23	08/13/23	SM2540 C	968.	mg/L
Turbidity	08/03/23	08/03/23	180.1	3.2	NTU

RESULTS

Client ID: Lake 8
ACT Lab No.: CF05520

Sample Type: Surface Water
Sample Time: 08/03/23 08:15

Parameter	Analysis Date Start	Analysis Date End	Method No.	Result	Unit
Algae Count	08/15/23	08/15/23	SM 10200 F	See Attached	cells/mL
Algae Identification	08/15/23	08/15/23		See Attached	
Chl/Pheo Ratio	09/06/23	09/06/23	SM10200 H	1.91	
Chlorophyll a	09/06/23	09/06/23	SM10200 H	18.7	ug/L
Golden Algae	08/03/23	08/03/23	P/C Microscopy	Absent	Pres/Abs
Midge count	08/03/23	08/03/23	SM10500 C	120	#/sq. meter
Pheophytin a	09/06/23	09/06/23	SM10200 H	<0.10	ug/L
Oxygen, Dissolved Field	08/03/23	08/03/23	SM4500 O G	5.4	mg/L as O2
pH, Field	08/03/23	08/03/23	SM4500H+ B	8.7	SU
Secchi Disk Depth	08/03/23	08/03/23	NALMS	1.07	meters
Temperature, Field	08/03/23	08/03/23	SM2550 B	32.8	C
Alkalinity, Total	08/04/23	08/04/23	SM 2320 B	190.	mg/L as CaCO3
Ammonia - N	08/04/23	08/04/23	SM4500NH3 D	0.08	mg/L as N
Nitrate + Nitrite - N	08/20/23	08/20/23	SM4500NO3 E	0.19	mg/L as N
Phosphorus, Total	09/06/23	09/07/23	365.3	0.038	mg/L as P
Total Hardness	08/08/23	08/08/23	SM2340C	167.	mg/L as CaCO3
Total Kjeldahl Nitrogen	08/04/23	08/04/23	SMNorg C,NH3 C/D	1.1	mg/L as N
E. coli, Colilert	08/03/23	08/04/23	SM 9223 B	18	MPN/100 mL
Total Dissolved Solids	08/14/23	08/15/23	SM2540 C	1330.	mg/L
Turbidity	08/03/23	08/03/23	180.1	4.7	NTU

Reviewed by: 

Frederick A. Amalfi, Ph.D.
Laboratory Director

Aquatic Consulting & Testing, Inc.
1525 W. University Drive, Suite 106
Tempe, AZ 85281
480-921-8044 fax: 480-921-0049
lab@aquaticconsulting.com

Chain of Custody

Client Project Info:

Lake 5-8 Monthly Monitoring
Dobson Ranch Association

AC&T Client Reporting Information:

Dobson Ranch Association
2719 South Reyes
Mesa, AZ 85202

Attn: Fran Pawlak, Community Manager
P: 4/80-831-8314
E:

AC&T Sampler: Ann

Sample Location ID:	Date:	Time:	Matrix:	P-T	NO3+NO2	TKN-Elec	Ammonia (NH3)	Hardness	Alkalinity	TDS	E. Coli	#Chl/Pheo	Alage - ID + #	Golden algae	Turb	Field Measurements: pH, Temp, O2	Sample Containers # / Preservation: None Preserved	Na2S2O3 (Sterile)	HNO3 (Nitric)	H2SO4 (Sulfuric)	Lugols	Other:	AC&T Laboratory Sample Identification
Lake 1	8/3/23	1050	SW											X	X	X	2						CF05513
Lake 2		1040	SW											X	X	X	2						514
Lake 3		1020	SW											X	X	X	2						515
Lake 4		1000	SW											X	X	X	2						516
Lake 5		945	SW	X	X	X	X	X	X	X	X	X	X	X	X	X	~~3~~ 4	1		1	1		517
Lake 6		915	SW	X	X	X	X	X	X	X	X	X	X	X	X	X	~~3~~ 4	1		1	1		518
Lake 7		845	SW	X	X	X	X	X	X	X	X	X	X	X	X	X	~~3~~ 4	1		1	1		519
Lake 8	↓	815	SW	X	X	X	X	X	X	X	X	X	X	X	X	X	~~3~~ 4	1		1	1		520
																							—

Page 1 of 1

Project Location:	A C & T Sample Receipt:			1. RELINQUISHED BY:	3. RELINQUISHED BY:
Dobson Ranch	Total # Containers:	36		Signature: Andrew Murrett	Signature: mr
PO#:	Received Intact:	YES	NO	Print Name: Andrew Murrett	Print Name:
Lakes Contract	# Bottles Preserved: 12	# Non:	24	Date: 8/3/23 Time: 1320	Date: Time:
Notes:	Samples On Ice:	YES	NO	2. RECEIVED BY:	4. RECEIVED BY:
	Ice Type:	WET	BLUE	Signature: Andrew Murrett	Signature: mr
	Sample Receipt Temperature:	31°c		Print Name: Andrew Murrett	Print Name: MJ
				Date: 8/3/23 Time: 1320	Date: 8-3-23 Time: 1320

mj

AQUATIC CONSULTING & TESTING, INC.

1525 W. University Drive, Suite 106
P.O. Box 1510
Tempe, Arizona 85281
Phone: (480) 921-8044 • Fax: (480) 921-0049

Lic. No. AZ0003

LABORATORY REPORT

Client: Dobson Ranch Association
2719 South Reyes Road
Mesa, AZ 85202

Date Submitted: 08/17/23
Date Reported: 09/11/23

Attn: Fran Pawlak, Executive Director

Project: Monthly Lake 1-8 Monitoring

RESULTS

Client ID: Lake 1
ACT Lab No.: CF05936

Sample Type: Surface Water
Sample Time: 08/17/23 09:10

Parameter	Analysis Date Start	Analysis Date End	Method No.	Result	Unit
Golden Algae	08/17/23	08/17/23	P/C Microscopy	Absent	Pres/Abs
Oxygen, Dissolved Field	08/17/23	08/17/23	SM4500 O G	7.1	mg/L as O2
pH, Field	08/17/23	08/17/23	SM4500H+ B	7.9	SU
Temperature, Field	08/17/23	08/17/23	SM2550 B	30.6	C
Turbidity	08/17/23	08/17/23	180.1	3.1	NTU

Client ID: Lake 2
ACT Lab No.: CF05937

Sample Type: Surface Water
Sample Time: 08/17/23 09:20

Parameter	Analysis Date Start	Analysis Date End	Method No.	Result	Unit
Golden Algae	08/17/23	08/17/23	P/C Microscopy	Absent	Pres/Abs
Oxygen, Dissolved Field	08/17/23	08/17/23	SM4500 O G	7.2	mg/L as O2
pH, Field	08/17/23	08/17/23	SM4500H+ B	8.2	SU
Temperature, Field	08/17/23	08/17/23	SM2550 B	31.5	C
Turbidity	08/17/23	08/17/23	180.1	5.7	NTU

RESULTS

Client ID: Lake 3
ACT Lab No.: CF05938

Sample Type: Surface Water
Sample Time: 08/17/23 09:25

Parameter	Analysis Date Start	Analysis Date End	Method No.	Result	Unit
Golden Algae	08/17/23	08/17/23	P/C Microscopy	Absent	Pres/Abs
Oxygen, Dissolved Field	08/17/23	08/17/23	SM4500 O G	6.5	mg/L as O2
pH, Field	08/17/23	08/17/23	SM4500H+ B	7.6	SU
Temperature, Field	08/17/23	08/17/23	SM2550 B	30.6	C
Turbidity	08/17/23	08/17/23	180.1	9.4	NTU

Client ID: Lake 4
ACT Lab No.: CF05939

Sample Type: Surface Water
Sample Time: 08/17/23 09:35

Parameter	Analysis Date Start	Analysis Date End	Method No.	Result	Unit
Golden Algae	08/17/23	08/17/23	P/C Microscopy	Absent	Pres/Abs
Oxygen, Dissolved Field	08/17/23	08/17/23	SM4500 O G	6.9	mg/L as O2
pH, Field	08/17/23	08/17/23	SM4500H+ B	8.2	SU
Temperature, Field	08/17/23	08/17/23	SM2550 B	31.6	C
Turbidity	08/17/23	08/17/23	180.1	4.4	NTU

Client ID: Lake 5
ACT Lab No.: CF05940

Sample Type: Surface Water
Sample Time: 08/17/23 09:45

Parameter	Analysis Date Start	Analysis Date End	Method No.	Result	Unit
Golden Algae	08/17/23	08/17/23	P/C Microscopy	Absent	Pres/Abs
Oxygen, Dissolved Field	08/17/23	08/17/23	SM4500 O G	6.2	mg/L as O2
pH, Field	08/17/23	08/17/23	SM4500H+ B	8.1	SU
Temperature, Field	08/17/23	08/17/23	SM2550 B	31.9	C
Turbidity	08/17/23	08/17/23	180.1	4.5	NTU

RESULTS

Client ID: Lake 6
ACT Lab No.: CF05941

Sample Type: Surface Water
Sample Time: 08/17/23 09:50

Parameter	Analysis Date Start	Analysis Date End	Method No.	Result	Unit
Golden Algae	08/17/23	08/17/23	P/C Microscopy	Absent	Pres/Abs
Oxygen, Dissolved Field	08/17/23	08/17/23	SM4500 O G	6.9	mg/L as O2
pH, Field	08/17/23	08/17/23	SM4500H+ B	8.3	SU
Temperature, Field	08/17/23	08/17/23	SM2550 B	32.4	C
Turbidity	08/17/23	08/17/23	180.1	5.5	NTU

Client ID: Lake 7
ACT Lab No.: CF05942

Sample Type: Surface Water
Sample Time: 08/17/23 10:00

Parameter	Analysis Date Start	Analysis Date End	Method No.	Result	Unit
Golden Algae	08/17/23	08/17/23	P/C Microscopy	Absent	Pres/Abs
Oxygen, Dissolved Field	08/17/23	08/17/23	SM4500 O G	7.9	mg/L as O2
pH, Field	08/17/23	08/17/23	SM4500H+ B	8.3	SU
Temperature, Field	08/17/23	08/17/23	SM2550 B	32.2	C
Turbidity	08/17/23	08/17/23	180.1	3.4	NTU

RESULTS

Client ID: Lake 8
ACT Lab No.: CF05943

Sample Type: Surface Water
Sample Time: 08/17/23 10:05

Parameter	Analysis Date Start	Analysis Date End	Method No.	Result	Unit
Golden Algae	08/17/23	08/17/23	P/C Microscopy	Absent	Pres/Abs
Oxygen, Dissolved Field	08/17/23	08/17/23	SM4500 O G	5.7	mg/L as O2
pH, Field	08/17/23	08/17/23	SM4500H+ B	8.2	SU
Temperature, Field	08/17/23	08/17/23	SM2550 B	32.0	C
Phosphorus, Total	09/06/23	09/07/23	365.3	0.030	mg/L as P
E. coli, Colilert	08/17/23	08/18/23	SM 9223 B	<1	MPN/100 mL
Turbidity	08/17/23	08/17/23	180.1	3.9	NTU

Reviewed by: _____

Frederick A. Amalfi, Ph.D.
Laboratory Director

Aquatic Consulting & Testing, Inc.
1525 W. University Drive, Suite 106
Tempe, AZ 85281
480-921-8044 fax: 480-921-0049
lab@aquaticconsulting.com

Chain of Custody

Client Project Info:

Lake 1-8 Monthly Monitoring
Dobson Ranch Association

AC&T Client Reporting Information:

Dobson Ranch Association
2719 South Reyes
Mesa, AZ 85202

Attn: Fran Paqwlak, Community Manager
P: 4/80-831-8314
E:

AC&T Sampler: Ann

Sample Location ID:	Date:	Time:	Matrix:	P-T	NO3+NO2	TKN-Elec	Ammonia (NH3)				E. Coli	#Chl/Pheo	Algae - ID + #	Golden algae	Turb	Field Measurements: pH, Temp, O2	Sample Containers # / Preservation: None Preserved	Na2S2O3 (Sterile)	HNO3 (Nitric)	H2SO4 (Sulfuric)	Lugols	Other:	AC&T Laboratory Sample Identification
Lake 1	8/17/23	910	SW										X	X	X	X	12						CF05936
Lake 2		920	SW										X	X	X	X	12						937
Lake 3		925	SW										X	X	X	X	12						938
Lake 4		935	SW										X	X	X	X	12						939
Lake 5		945	SW										X	X	X	X	12						940
Lake 6		950	SW										X	X	X	X	12						941
Lake 7		1000	SW										X	X	X	X	12						942
Lake 8	↓	1005	SW	X							X		X	X	X	X	12	1		1			943
																						—	

Project Location:	A C & T Sample Receipt:			
Dobson Ranch	Total # Containers:	18		
PO#:	Received Intact:	YES	NO	
Lakes Contract	# Bottles Preserved: 2	# Non:	16	
Notes:	Samples On Ice:	YES	NO	
	Ice Type:	WET	BLUE	
	Sample Receipt Temperature:	30°C		

1. RELINQUISHED BY:	3. RELINQUISHED BY:
Signature: Andrew Murrett	Signature:
Print Name: Andrew Murrett	Print Name:
Date: 8/17/23 Time: 1360	Date: Time:
2. RECEIVED BY:	**4. RECEIVED BY:**
Signature: MJ	Signature:
Print Name: MJ	Print Name:
Date: 8/17/23 Time: 1300	Date: Time:

DOBSON RANCH LAKES
Bi-Monthly Lake Inspection

Date: 8/3/23
By:

Lake	Temp	Dis. oxygen	pH	Clarity	Algae	Submerged weeds	Fish behavior	Waterfowl density	Insect activity	Mechanical issues
1	32.4 C	5.7 mg/L	8.3 SU	2.4 SDz NTU	☐ Suspended ☐ Floating ☐ Bottom ☐ Attached	☐ Present ☑ Absent	☑ Normal ☐ Distress ☐ Dead ___	No. 17 No/A ___	☑ Normal ☐ Infestation	Fountain ☑ Operating ☐ No service
2	32.0 C	5.7 mg/L	8.2 SU	5.9 SDz NTU	☐ Suspended ☐ Floating ☐ Bottom ☐ Attached	☐ Present ☑ Absent	☑ Normal ☐ Distress ☐ Dead ___	No. 11 No/A ___	☑ Normal ☐ Infestation	Fountain ☐ Operating ☐ No service
3	32.0 C	6.4 mg/L	8.3 SU	4.6 SDz NTU	☐ Suspended ☐ Floating ☐ Bottom ☐ Attached	☐ Present ☑ Absent	☑ Normal ☐ Distress ☐ Dead ___	No. 6 No/A ___	☑ Normal ☐ Infestation	Fountain ☑ Operating ☐ No service
4	33.0 C	6.4 mg/L	8.2 SU	4.3 SDz NTU	☐ Suspended ☐ Floating ☐ Bottom ☐ Attached	☐ Present ☑ Absent	☑ Normal ☐ Distress ☐ Dead ___	No. 11 No/A ___	☑ Normal ☐ Infestation	Fountain ☑ Operating ☐ No service
5	33.4 C	5.7 mg/L	8.4 SU	48" SDz 6.8 NTU	☐ Suspended ☐ Floating ☐ Bottom ☐ Attached	☐ Present ☑ Absent	☑ Normal ☐ Distress ☐ Dead ___	No. 14 No/A ___	☑ Normal ☐ Infestation	
6	33.0 C	6.9 mg/L	8.5 SU	32" SDz 6.3 NTU	☐ Suspended ☐ Floating ☐ Bottom ☐ Attached	☐ Present ☑ Absent	☑ Normal ☐ Distress ☐ Dead ___	No. 22 No/A ___	☑ Normal ☐ Infestation	
7	33.0 C	6.8 mg/L	8.4 SU	35" SDz 3.2 NTU	☐ Suspended ☐ Floating ☐ Bottom ☐ Attached	☐ Present ☑ Absent	☑ Normal ☐ Distress ☐ Dead ___	No. 32 No/A ___	☑ Normal ☐ Infestation	Fountain ☑ Operating ☐ No service
8	32.8 C	5.4 mg/L	8.7 SU	42" SDz 4.7 NTU	☐ Suspended ☐ Floating ☐ Bottom ☐ Attached	☐ Present ☑ Absent	☑ Normal ☐ Distress ☐ Dead ___	No. 12 No/A ___	☑ Normal ☐ Infestation	Aerators ☑ Operating ☐ No service

Notes and recommendations for treatment/operation:

DOBSON RANCH LAKES
Bi-Monthly Lake Inspection

Date: 8/17/23

By: _____

Lake	Temp	Dis. oxygen	pH	Clarity	Algae	Submerged weeds	Fish behavior	Waterfowl density	Insect activity	Mechanical issues
1	30.6 C	7.1 mg/L	7.9 SU	3.1 SDz NTU	☐ Suspended ☐ Floating ☐ Bottom ☐ Attached	☐ Present ☒ Absent	☒ Normal ☐ Distress ☐ Dead ___	No. 21 No/A ___	☒ Normal ☐ Infestation	Fountain ☒ Operating ☐ No service
2	31.5 C	7.2 mg/L	8.2 SU	5.7 SDz NTU	☐ Suspended ☐ Floating ☐ Bottom ☐ Attached	☐ Present ☒ Absent	☒ Normal ☐ Distress ☐ Dead ___	No. 14 No/A ___	☒ Normal ☐ Infestation	Fountain ☒ Operating ☐ No service
3	30.6 C	6.5 mg/L	7.6 SU	9.4 SDz NTU	☐ Suspended ☐ Floating ☐ Bottom ☐ Attached	☐ Present ☒ Absent	☒ Normal ☐ Distress ☐ Dead ___	No. 7 No/A ___	☒ Normal ☐ Infestation	Fountain ☒ Operating ☐ No service
4	31.6 C	6.9 mg/L	8.2 SU	4.4 SDz NTU	☐ Suspended ☐ Floating ☐ Bottom ☐ Attached	☐ Present ☒ Absent	☒ Normal ☐ Distress ☐ Dead ___	No. 12 No/A ___	☒ Normal ☐ Infestation	Fountain ☒ Operating ☐ No service
5	31.9 C	6.2 mg/L	8.1 SU	4.5 SDz NTU	☐ Suspended ☐ Floating ☐ Bottom ☐ Attached	☐ Present ☐ Absent	☒ Normal ☐ Distress ☐ Dead ___	No. 17 No/A ___	☒ Normal ☐ Infestation	
6	32.4 C	6.9 mg/L	8.3 SU	5.5 SDz NTU	☐ Suspended ☐ Floating ☐ Bottom ☐ Attached	☐ Present ☒ Absent	☒ Normal ☐ Distress ☐ Dead ___	No. 21 No/A ___	☒ Normal ☐ Infestation	
7	32.2 C	7.9 mg/L	8.3 SU	3.4 SDz NTU	☐ Suspended ☐ Floating ☐ Bottom ☐ Attached	☐ Present ☒ Absent	☒ Normal ☐ Distress ☐ Dead ___	No. 27 No/A ___	☒ Normal ☐ Infestation	Fountain ☒ Operating ☐ No service
8	32.0 C	5.7 mg/L	8.2 SU	3.9 SDz NTU	☐ Suspended ☐ Floating ☐ Bottom ☐ Attached	☐ Present ☒ Absent	☒ Normal ☐ Distress ☐ Dead ___	No. 13 No/A ___	☒ Normal ☐ Infestation	Aerators ☒ Operating ☐ No service

Notes and recommendations for treatment/operation: