

February 3, 2010

Scott Meade
149 Cedar Lake East
Denville, New Jersey 07834

Dear Mr. Meade:

Re: Cedar Lake
2009-Year End Report

The following report addresses the 2009 lake management program that was conducted by Aquatic Technologies Inc. Aquatic Technologies Inc. has been hired by Cedar Lake POA to provide the lake management and aquatic vegetation control since 1996. The items addressed in this report include the following:

- 1) Introduction
- 2) Overview of 2009 Lake Management Program
- 3) Recommendations
- 4) Summary

INTRODUCTION

Aquatic Technologies, Inc. provided consultative service from the initial survey and application until the end of the growing season. Aquatic Technologies Inc. monitored the lake to assure proper vegetation control and effective lake management strategies. Service calls included a complete survey of the vegetation growth throughout the lake body and shoreline.

In addition, during site visits, Aquatic Technologies, Inc. analyzed the following parameters:

- A) Dissolved Oxygen
- B) Temperature
- C) Secchi (water clarity)

Based on observations and the data collected, Aquatic Technologies, Inc. determined the areas of concern and addressed each concern with either recommendations and/or herbicide applications.

During the course of the 2009 growing season, Aquatic Technologies, Inc. observed the following species of nuisance aquatic vegetation in Cedar Lake:

- a) Curly- leaf Pondweed – *major growth*
- b) Eurasian Milfoil- *minor growth*
- c) Waterlily
- d) Watershield
- e) Naiad Species - *minor growth*
- f) Pondweed Species (*Clasping Leaf, Large Leaf, Sago, Flat-Stem and Narrow Leaf Pondweeds*).
- g) Bladderwort (*Utricularia sp*) *minor growth*

OVERVIEW OF 2009 LAKE MANAGEMENT PROGRAM

Listed below is the Consultative-Service™ visits and the actions taken during each visit:

- April 23, 2009 Surveyed Lake: Observed no nuisance vegetation to this time. Sonar Program will occur in approximately 14 days. Secchi: 7+, DO 11.0, Temperature 57f
- May 8, 2009 Applied initial application of Sonar to the lake for control of Curly-Leaf pondweed, Eurasian Milfoil, Naiad, Elodea, Coontail and Potamogeton species growth. Observed the growth of large leaf pondweed along North and South coves. Observed a large population of snails along shoreline. Secchi: 10+ ft and Dissolved Oxygen 10.6 ppm and temperature 64 f.
- May 14, 2009 Plants continue to show signs of chlorosis and decompose within the water column. Obtained FasTest sample. Observed no significant algal growth. No outflow at this time. Secchi: 10+ ft, DO 10 ppm and temperature 64 f.
- May 26, 2009 Plants continue to show signs of chlorosis and decompose within the water column. Observed no significant algal growth.
- June 4, 2009 Plants continue to show signs of chlorosis and decompose within the water column. Applied additional Sonar to increase fluridone concentration. Observed algal growth present to the boat ramp area and swim lanes. Applied algaecide to both swim lanes and beach areas and boat ramp areas.
- June 12, 2009 Plants continue to show signs of chlorosis and decompose within the water column. Applied the split treatment of Sonar (Fluridone). The application was applied to further increase Fluridone concentration and contact time with the aquatic vegetation. Secchi: 12 ft and DO 8.9 ppm, temperature 75 f.
- June 18, 2009 Plants continue to show signs of chlorosis and decompose within the water column. No nuisance algal growth present.
- June 16, 2009 Plants continue to show signs of chlorosis and decompose within the water column. Obtained FasTest sampling for fluridone concentration. No nuisance algal growth present.
- July 1, 2009 Plants continue to decompose within the water column. Secchi: 12 ft and DO 8.9 ppm, temperature 75 f.
- July 6, 2009 Applied algaecide and systemic herbicides to the lagoon to control emergent and algal populations. Applied vegetation control to the outflow of dam area per NJDEP requirements. Treatment per the request of POA. Secchi: 8 ft and DO 9ppm, temperature 82 f.
- July 21, 2009 Observed no significant algal or macrophyte growth in main waterbody. Past treatment in Lagoon worked very well, targeted plants continue to decompose.
- July 27, 2009 Observed no significant algal or macrophyte growth in main waterbody. Past treatment in Lagoon worked very well, targeted plants continue to decompose.
- August 4, 2009 – Surveyed Lake: Observed Chara along Cove bottom. Chara (vascular algae) is beneficial for fisheries and nutrient uptake, it is not recommended to manage with an herbicide at this time. If the plants become a nuisance, it is recommended to treat at that time. Secchi 9 feet, D.O. 9 ppm and Temperature 84F
- August 19, 2009 Applied algaecide to the lagoon to algal populations. Applied vegetation control to the outflow of dam area per NJDEP requirements. Observed no significant algal or macrophyte growth in main waterbody. Secchi: 8 ft

● Page 3

August 31, 2009 Observed no significant algal or macrophyte growth in lagoon waterbody.

Sept. 1, 2009 Surveyed Lake: observed no significant growth of nuisance aquatic vegetation with the lake. Observed plants decomposing in Lagoon from past nuisance vegetation control application. Observed a very minor growth of planktonic algae bloom within the man lake. No treatment is warranted at this time. Overall condition: good. Secchi 8+ feet, D.O. 8.9ppm and Temperature 77F

Sept. 16, 2009 Observed no significant algal or macrophyte growth in waterbody.

SUMMARY

As seen in past seasons, the use of the Aquatic Technologies' Inc. Sonar - Fluridone Program in the 2009 season achieved all of the goals set forth in the beginning of the program. The control of the nuisance Eurasian Milfoil and Curly-Leaf Pondweed and Naiad growth was achieved. Eurasian milfoil did not present a nuisance problem in the lake for the seventh consecutive year (2002 thru 2009). The program also reduced the planktonic algal populations in the lake.

The program limited the algal populations (historically caused from large plant stand decomposition) and encouraged the algal growth to occur later in the season. As experienced in years past and in the 2009 season, there was no need for any full lake algaecide treatments. Algaecide treatments occurred for minor spot treatments and the 2009 season did not experience any nuisance planktonic blooms or filamentous algae mats.

Beneficial green algae population (*Spirogyra species*) was observed in the spring and early summer. Green algae are very beneficial compared to the toxic blue-green planktonic algae that have been historically present with the lake, during the months of July and August. Minor nuisance green algae populations were controlled with select spot treatments.

2009 season again experienced the observation of the *spirogyra* green algae is confirmation of an algae species population shift from blue-green algae to green algae. This positive shift is directly related to the implementation of the Sonar program and its reduction of the large nutrient "Slug" releases associated with contact herbicide applications.

2009 season experienced snail population within the ecosystem. The population of these invertebrates cannot be directly attributed to the vegetation management program. However, over the past few years, the reduction of algal treatments (copper based algaecides) and the prescribed management of the macrophytes populations with the use of Sonar (fluridone) may have indirectly allowed the invertebrate to prosper. For example, the controlled plant decomposition and the lack of direct invertebrate contact with copper compounds may have caused the snail population propagation. Only further investigation can determine the facts of the situation.

The Sonar programs have continued to allow for the re-establishment of native aquatic plants. Observed was the growth of Naiads and Chara. Also observed was the re-establishment of *Potamogeton pectinatus* (Sago pondweed) and (*Potamogeton amplifolius*) Large-Leaf Pondweed. These plants indicate the continued revival of the native plants population in the lake. A new species was observed in the north and south coves, and was identified as bladderwort (*Utricularia sp.*). The bladderwort population was minor at the time of observation. Aquatic Technologies will continue to monitor this growth. Future management may be required if the population becomes a nuisance.

The Large-leaf pondweed may need to be managed in the future, if it becomes a nuisance. This selective management, if required, will reduce nuisance levels, maintaining a healthy and sustainable managed population.

CLPOA's decision and Aquatic Technologies recommendation for use of Sonar achieved its goals. All of the following seasonal goals were met:

2009 aquatic vegetation control program goals

- | | |
|---|--|
| 1) Decreased Rooted vegetation growth | 6) maintaining proper fisheries management |
| 2) Decreased Filamentous algal growth | 7) close team relationship with CLPOA |
| 3) Reduced nutrient "slug" post herbicide treatment | 8) client satisfaction |
| 4) Improved Aesthetic value | |
| 5) A Pro-active relationship with CLPOA | |

RECOMMENDATIONS

Based on our findings since 1996. Aquatic Technologies presents the following recommendations for your consideration:

- A) Continue the seasonal application of Fluridone (sonar) to the lake for control of rooted aquatic vegetation to assure proper vegetation management.
- B) Continue the Split application of Fluridone to work in conjunction with the water level criteria and the proscribed concentration of Fluridone in the water column.
- C) Continue Sonar monitoring schedule in order to maintain an effective lake management program and vegetation control.
- D) Incorporate a selective management program, for small populations of nuisance aquatic vegetation.
- E) Continue to spot-treat the lagoon for emergent vegetation and limit these populations of emergent vegetation. Management of these populations will improve the overall value of the lagoon.
- F) Monitor the establishment of the snail populations and further investigate the implication of this population.
- G) Monitor the Bladderwort population, and selectively manage if nuisance populations are observed.
- H) Continue the selective management of nuisance shoreline emergent vegetation, i.e. Phragmites, lily and cattails.
- I) Continue to incorporate an early algaecide application to the lake to deter any aggressive growth of the mid season algal bloom, (if required).
- J) Limit the inflow to the lake of nutrient rich soils and waters from the community and surrounding watershed. Incorporate and commit to the use of NON-PHOSPHORUS fertilizers in the community.
- K) AT will file the NJDEP permit in February/March. NJDEP early permit approval allows for the lake treatments and monitoring to begin prior to excessive nuisance vegetation growth and thus achieve a successful vegetation control program.

Over the past 14 years, Aquatic Technologies thanks the Cedar Lake Board for their business relationship and Aquatic Technologies Inc. looks forward to the continued successful consultative lake management program.

Should you have any questions or comments regarding this report, please feel free to contact us at (973) 773-9567.

Sincerely,



Christopher Hanlon
Aquatic Technologies, Inc.