Allied Biological

Year End Report

Mount Kemble Lake

Morristown, New Jersey

Corp Office: 580 Rockport Road Hackettstown, NJ 07840 908-850-0303 Fax 908-850-4994
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January 21, 2011

Ruth Chaney
Mount Kemble Lake Association Inc.
Morristown, New Jersey 07960

Year End Report
2010 Lake Management Program/ Action Plan
Mount Kemble Lake

Thank you for the opportunity to assist in the lake management efforts of Mount Kemble Lake located in Morristown, New Jersey. The following is a Year End Report detailing the water quality monitoring program, lake surveys, treatment dates, conditions, and discussion of the 2010 management season featuring an Action Plan for the upcoming 2011 season. Biologists were on site at Mount Kemble Lake approximately once a month from May through September to conduct a survey of the lake for plant and algae growth, and conduct basic water quality testing. Following each survey, herbicide and algaecide applications were conducted based on the assessment of the lake and upon approval of the association. Three detailed water quality sampling rounds were also conducted with a full lake survey. Vascular plant pictures and descriptions are provided in Appendix A. Lake survey reports are provided in Appendix B.

Aquatic Macrophytes Observed at Mount Kemble Lake 2010:

Scientific Name	Common Name
Najas guadalupensis	Southern Naiad
Potamogeton cripus	Curlyleaf Pondweed
Potamogeton diversifolious	Variable Leaf Pondweed
Elodea canadensis	American Waterweed
Lemna minor	Duckweed sp.

Summary of Treatments at Mount Kemble Lake 2010:

Date	Product Applied	Acres Treated	Observed/ Target Plants
6/24/2010	Reward	5	Southern Naiad
	Copper Sulfate	5	Filamentous Algae
7/15/2010	Reward	2	Southern Naiad

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May 13 – Water Quality Survey
Temperature: 62.4°F   Dissolved Oxygen: 9.32ppm   Secchi: 6.5ft.

During the initial survey, Southern Naiad was observed in a moderate density in the northern end of the lake along with trace amounts of Curlyleaf Pondweed. The western shoreline and into the southern portion of the lake displayed sparse amounts of Southern Naiad and trace Curlyleaf Pondweed with trace benthic filamentous algae found among the vegetation. Water quality data and samples were collected at this time.

June 24 – Survey and Treatment
Temperature: 84.2°F   Dissolved Oxygen: 9ppm   Secchi: 8ft.

During the second survey, the northern portion of the lake displayed dense growth of Southern Naiad with additional growth found extending along the shoreline areas. Floating and benthic filamentous algae were also observed within these locations. A treatment utilizing aquatic herbicide **Reward** was applied to control the Southern Naiad growth and an algaecide treatment of **Copper Sulfate** was used to target nuisance filamentous algae.

July 15 – Survey and Treatment
Temperature: 79°F   Dissolved Oxygen: 7ppm   Secchi: 7ft.

During this survey a trace quantity of Leafy Pondweed and Southern Naiad were observed in the beach area and extending along the western shoreline. Trace amounts of Duckweed were found windblown along shoreline areas among docks. An application of **Reward** was administered to target the growth of Southern Naiad.

July 16 – Water Quality Survey
Temperature: 83.8°F   Dissolved Oxygen: 8.58ppm   Secchi: 6ft.

This survey found the greatest density of Southern Naiad along the western shoreline around the beach area. The remainder of the lake displayed trace to sparse concentrations of naiad species in scattered locations. The plants appeared to be discolored from the previous treatment. Water quality data and samples were collected.

August 11 – Survey
Temperature: 78.8°F Dissolved Oxygen: 6ppm Secchi: 9ft.

At this time, Southern Naiad was observed to be effected from the last treatment appearing brownish in color. Trace densities of Duckweed were found at both the lake inlet and outlet points. Filamentous algae were found in trace quantities just north of the beach area. No treatment was conducted at this time.

September 10 – Water Quality Survey
Temperature: 72.5°F Dissolved Oxygen: 7.54ppm Secchi: 9ft.

The final survey of the year found dense Southern Naiad around the inlet with quantities thinning towards the southern portion of the lake where the lake was free of all plant growth. Trace duckweed was also observed near the inlet. Water Quality data and samples were collected at this time.

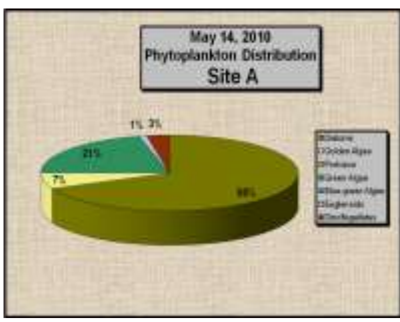
Vascular Plant Management

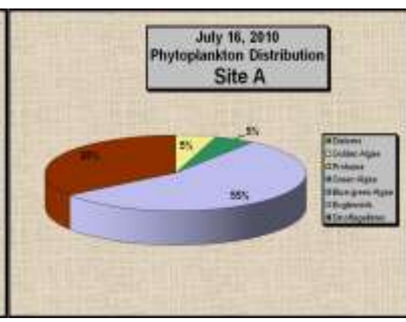
During the 2010 lake management season, vascular plant growth was recorded throughout Mount Kemble Lake, most notably Southern Naiad, Curlyleaf Pondweed, Leafy Pondweed, and Duckweed. Two treatments utilizing aquatic herbicide Reward focused mainly on the nuisance growth of Southern Naiad. In past years contact herbicides were applied on three occasions in 2009 and two applications were warranted during the 2008 management season. The amount of acres treated in 2010 decreased by two and a half acres from the total acreage treated in 2009.

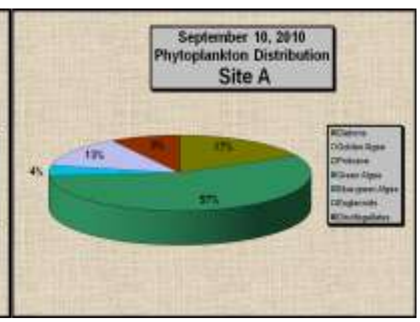
Algae Management

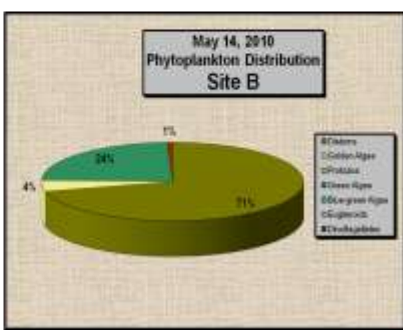
Algae are important to the productivity of Mount Kemble Lake. They encompass the base of the food chain and are essential to life in the lake. However, they may become a nuisance when it obstructs recreational activities or congests the water column. Filamentous algae are multicellular, macroscopic algae typically found as two types: floating (visible mats on the surface of the lake), or benthic (attached to bottom substrate). Planktonic algae, sometimes referred to as unicellular algae, are microscopic, free-floating algae that impact the water clarity. Planktonic algae when populations are elevated can "coagulate" and resemble filamentous algal mats. Throughout the management season, filamentous algae growth was managed with a single algaecide application utilizing Copper Sulfate.

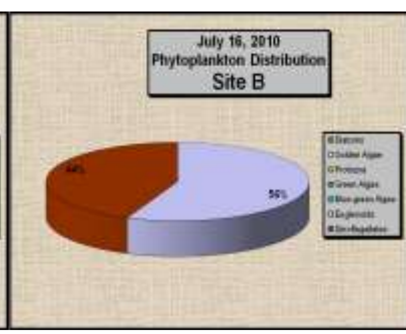
As a portion of the water quality monitoring Phytoplankton identification and enumeration were performed on three occasions during May, July, and September. The May algae count and diversity was high with values of 1040 and 1550 organisms per milliliter. However, the assemblage was dominated by a mixture of desirable diatoms. This had minimal effect of the water clarity with a recorded Secchi value of six and a half feet. Sparse green algae and trace amounts of golden algae, dinoflagellates, and euglenoids were also observed. In July, the algal density at each site had favorably decreased since the last sampling event. The phytoplankton count recorded only 200 and 160 organisms per milliliter at each of the sampling sites. The majority of the assemblage was a mixture of euglenoids and dinoflagellates. The final phytoplankton survey of the management season found algal density had increased at both sites, but was still considered low to moderate with high diversity. Each assemblage was dominated by green algae which are favorable to the health of the lake system. Provided below are pie graphs displaying phytoplankton distribution and copies of the algae identification and enumeration are included in Appendix C of this report. The remainder of the water quality monitoring program results and detailed explanations follow.

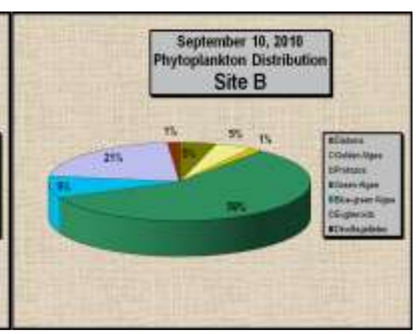












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Water Quality Monitoring

In 2010, the water quality monitoring program consisted of three collection dates, May 14th, July 16th, and September 10th, 2010. The water quality samplings consisted of two collection sites with the first, Site A, toward the north end of the lake near the inlet, and the second, site B, located in the south portion of the lake near the outlet. Consult Appendix D for a detailed map of these locations. Temperature and dissolved oxygen profiles were measured with an YSI multi-parameter meter at the lake station site, and conducted every meter. Water clarity was measured using a Secchi disk. The pH was measured with a Hach wide-range pH kit. The remaining parameters were collected in decontaminated labeled containers, and immediately stored on ice in a transport cooler. These samples were then delivered to a New Jersey certified lab for analysis.

Yearly water quality records reveal changes in water chemistry which could have an affect on other characteristics of the lake system. Information gained through testing of water quality parameters is used to determine the nature of problems in the lake. Over-population of algae or aquatic plants, excessive nutrient loading and the presence of anoxic conditions are a few common problems. In the following section, a brief summary is provided of each water quality parameter and how it affects the lake system. Results of the Water Quality Monitoring Program sampling rounds are tabulated and provided below with a detailed discussion. Laboratory Results are provided in Appendix D.

2010 Water Quality Results

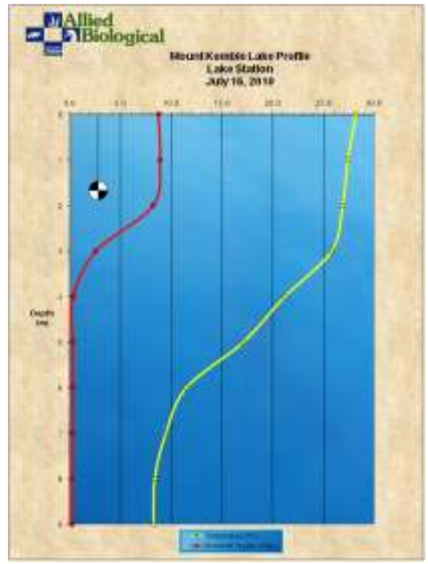
Water Quality Information Site A: Inlet				
Parameters	Units	5/13/2010	7/16/2010	9/10/2010
Temperature	°C	16.8	28.8	22.2
Dissolved Oxygen	mg/L	9.41	8.58	7.71
pH	SU	7.5	8	8
Ammonia	mg/L	<0.2	<0.2	<0.2
Conductivity	Umhos/cm	266	300	270
Nitrate	mg/L	0.6	<0.2	<0.2
Total phosphorus	mg/L	0.02	0.01	0.02
Total Suspended Solids	mg/L	< 3	6	< 3

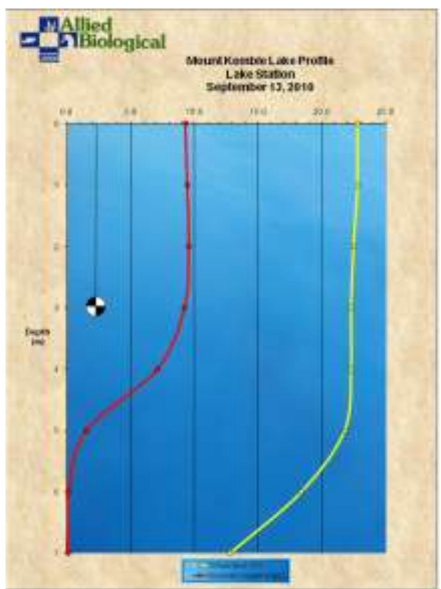
Water Quality Information Site B: Outlet Surface				
Parameters	Units	5/13/2010	7/16/2010	9/10/2010
Temperature	°C	16.9	28.2	22.5
Dissolved Oxygen	mg/L	9.32	8.74	7.54
pH	SU	7.5	8	8
Ammonia	mg/L	<0.2	0.37	<0.2
Conductivity	Umhos/cm	266	289	261
Nitrate	mg/L	0.6	<0.2	<0.2
Total phosphorus	mg/L	0.02	0.02	0.03
Total Suspended Solids	mg/L	< 3	7	< 3

Water Quality Information Site C: Outlet Bottom				
Parameters	Units	5/13/2010	7/16/2010	9/10/2010
Temperature	°C	7.2	8.3	12.8
Dissolved Oxygen	mg/L	0.08	0.19	0.34
pH	SU	7	7	8
Ammonia	mg/L	<0.2	<0.2	<0.2
Conductivity	Umhos/cm	246	262	272
Nitrate	mg/L	0.3	<0.2	<0.2
Total phosphorus	mg/L	0.03	0.03	0.04
Total Suspended Solids	mg/L	9	11	< 3

Boxes outlined in red indicate significant values that exceed criteria.

Full temperature and dissolved oxygen profiles were performed in May, July, and September of the 2010 season (Appendix D). The temperature and dissolved oxygen profiles all followed a similar trend decreasing with an increase to water depth. The May profile recorded a rapid decrease in dissolved oxygen after a three meter depth. Dissolved oxygen levels were extremely low at the lake bottom throughout the year. Surface values ranged from 7.71 mg/L to 9.41 mg/L throughout the year which is an indicator of good overall water quality. Values recorded from the lake bottom samples ranged from 0.08 to 0.34 mg/L which are exceeding low and are stressful to most aquatic organisms.





Dissolved Oxygen is the measurement of the amount of oxygen freely available to aquatic biota in water. Several factors play a role in affecting the amount of dissolved oxygen in the water. These factors include temperature, low atmospheric pressure (such as higher altitude), the mineral content of the water, and water mixing (via wind, flow over rocks, or thermal upwelling). Warmer temperatures, low atmospheric pressure, and increased mineral content all conspire to decrease the solubility of oxygen in water. Lower temperatures and increased water mixing tend to increase the dissolved oxygen solubility in water.

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In addition, an over abundance of organic matter, such as dead algae or plants causes rapid aerobic bacteria growth. During this growth, bacteria consume oxygen during respiration, which can cause the water's dissolved oxygen to decrease.

Dissolved oxygen has a wide range, from 0 mg/L to 20 mg/L. To support diverse aquatic biota, 5-6 mg/L is minimally required, but 9-10 mg/L is an indicator of better overall water quality. Dissolved oxygen reading of below 4 mg/L is stressful to most aquatic organisms, especially fish.

Conductivity levels for Mount Kemble Lake values ranged from 246 to 300 umhos/cm which were below the acceptable threshold of 500 umhos/cm for a lake system. There are several factors that control the level of conductivity in a lake including geology, watershed size, source for runoff, and chemical reactions that can occur among organisms living in the lake.

Conductivity is the measure of water's ability to conduct an electrical current, and is measured in umhos/cm. The higher the number of charged particles (ions) in the water, the easier for electricity to pass through it. Conductivity is useful in lake management by estimating the dissolved ionic matter in the water. The lower the conductivity, the higher the quality of water (oligotrophic). A higher conductivity usually indicates an abundance of plant nutrients (total phosphorous and nitrate), or eutrophic conditions. Conductivity can be increased by industrial discharge, road salt runoff, and septic tank leaching. Distilled water has a conductivity of 0.5 to 2.0 umhos/cm, while drinking water conductivity typically ranges from 50 to 1,500 uhmos/cm. Conductivity below 500 umhos/cm is considered ideal in a lake system.

Phosphorus is an important nutrient contributing to algal and vascular plant growth. The levels of phosphorus in 2010 ranged from 0.01 mg/L to 0.04 mg/L. Values greater than 0.3 mg/L are high enough to cause excessive plant and algae growth.

Total phosphorous is a chemical compound derived from phosphorous and oxygen. Total phosphorous is usually present in freshwater in low concentrations, and is often the limiting nutrient to aquatic plant growth. However, man-made sources of phosphorous include septic system leaching, fertilizer runoff, and improperly treated wastewater. These phosphorous inputs usually enter a freshwater lake system during rain events, and bank erosion.

A total phosphorous level greater than 0.03 mg/L can promote excessive aquatic plant growth and decomposition, either in the form of algal blooms, or nuisance quantities of aquatic plants. This process is called eutrophication, and when induced or sped up by man-made nutrient inputs, it is called cultural eutrophication. As a result of this excessive growth, recreational activities, such as swimming, boating, and fishing in the lake can be negatively impacted. In addition, aerobic bacteria will thrive under these conditions, causing a decrease in dissolved oxygen levels which can negatively impact aquatic biota such as fish.

Nitrate levels during the 2010 management season ranged from less than 0.2 mg/L to 0.6 mg/L. The values above 0.3 mg/L will promote excessive growth of aquatic plants and algae.

Nitrates are chemical compounds derived from nitrogen and oxygen. Nitrogen is needed by all plants and animals to make proteins needed for growth and reproduction. Nitrates are generated during plant and animal decomposition, from man-made sources, and from livestock and waterfowl sources. Man-made sources of nitrates include septic system leaching, fertilizer runoff, and improperly treated wastewater. Freshwater lake systems can potentially receive large nitrate inputs from waterfowl, specifically large flocks of Canada geese. An increase in nitrate levels can in turn cause an increase in total phosphorous levels.

The transparency at Mount Kemble Lake was measured throughout the season during lake and water quality surveys. The Secchi readings throughout the year ranged in values from six to nine feet clarity which is designated as satisfactory for a lake system. Additionally, total suspended solids samples were collected during the three water quality sampling rounds. During the May and July sampling rounds values were greatest at the outlet site bottom sample. In September, all results were below the mean detection limits.

Total suspended solids refer to all of the particulate matter suspended in the water column. When these solids settle to the bottom of a water body (a process called siltation), they become sediments. There are two components that make up total suspended solids: inorganic and organic. The inorganic portion is usually considerably higher than the organic portion includes silts, clays, and soils. Organic solids include algae, zooplankton, bacteria and organic debris. All these solids create turbid (or "muddy") conditions. The geology and vegetation of a *watershed affect the amount of suspended solids that enter a lake system. Most suspended solids originate from accelerated soil erosion from agricultural operations, logging activities, and construction activities. Another source is the disturbance of bottom sediments from dredging activities, grazing of bottom feeding fish, and recreational activities such as boating.*

Total suspended solids can have many effects on a lake and its aquatic biota. Suspended solids can clog fish gills which can directly cause death, or indirectly reduce growth rates. Total suspended solids also reduce light penetration, which could in turn limit the photic zone of the lake. This reduction of suitable macrophyte growing habitat could cause a decrease of dissolved oxygen. Indirectly, suspended solids can cause an increase in temperature due to greater heat absorbency. This temperature increase can also lead to a decrease in dissolved oxygen, and cause stratification. Stratification in turn causes the release of bottom nutrients back into the water column. Finally, as suspended solids settle on the bottom, they can smother aquatic macroinvertebrates, cover fish breeding sites, or even smother fish eggs.

Ammonia levels in the 2010 management season were recorded below the detectable limits except at the Outlet site surface sample during the July 16th site visit. This value was recorded as 0.37 mg/L which is greater than the ideal 0.30 mg/L value designated for a healthy lake system.

Ammonia is a type of nitrogen compound used by plants and algae to support growth. Ammonia content in a body of water is influenced by decaying plants and animals, animal waste, industrial waste effluent, agricultural runoff, and atmospheric nitrogen gas transfer. A concentration exceeding 0.30 mg/L can promote excessive plant and algae growth. Elevated ammonia levels can increase nitrification, which in turn depletes the oxygen content of water. Extremely high ammonia levels can be toxic to aquatic biota (such as fish).

Full copies of the laboratory reports are included in Appendix D.

Discussion

The National Oceanic and Atmospheric Administration recorded June through August 2010, as the warmest spring and summer period in the state of New Jersey's history. The combination of heat and dry conditions lead to many of New Jersey's water bodies experiencing drought-like conditions, an increase in algal growth, and lowering of water levels. However, Mount Kemble Lake did not display any adverse lake conditions despite this climatic effect.

The 2010 phytoplankton results recorded no significant growth of blue-green algae which is favorable in lake systems and the quality of transparency was unaffected. The two surface samples examined for total suspended solids were also ideal. The sample collected near the outlet at the lake bottom was significantly higher recording values leading to diminished water quality. By late season water clarity was ideal reaching a nine foot Secchi depth and it had appeared that the sediments had settled and all samples were recorded below the detectable limits.

The analytical results for the season revealed multiple chemical compounds including phosphorus, ammonia, and nitrates exceeding the acceptable limits which are known to contribute to the excessive growth of aquatic plants and algae. The direct source of the elevated values is unclear, but common contributors to these compounds include man-made sources such as septic system leaching or fertilizer runoff and can be affected by inputs of waterfowl.

The Dissolved oxygen profiles collected at Mount Kemble during the three water quality sampling rounds revealed extremely low values near the bottom of the lake especially noted in the July survey where oxygen depleted waters were just twelve feet below the surface. Throughout the year the lake did not experience seasonal vertical mixing a process caused by the temperature and density relationship. The lack of circulation kept the oxygen depleted water at the lake bottom.

Nuisance submerged aquatic vegetation for the 2010 management season was most notably the growth of Southern Naiad. Despite the two herbicide treatments, portions of the lake displayed dense areas of the naiad species continuing into September. Typically, Southern Naiad is an ideal native aquatic macrophyte for its ability to form dense strands of rooted vegetation and will generally grow a couple feet in height not reaching the water's surface. The growth of this plant is encouraged in areas that are not an obstruction to recreational activities or to the aesthetics of the lake.

Action Plan Initiatives

Assessment

Water Quality Monitoring – Water quality monitoring allows for proactive management of the lakes' environments and reduces the opportunity for the development of problematic situations. Samples should be collected from both ends of Mt Kemble Lake at one foot below surface and near lake bottom in the deepest area for a total of three samples per sampling date. Samples should be analyzed for Ammonia, Conductivity, Nitrates, Phosphorus, and Total Suspended Solids. In addition, Zooplankton sampling and quantification should provide insight to the forage base of the lake with respect to the fishery and will indicate the trophic state of the lake. Vertical zooplankton samples can be collected at a deep water site on each sampling event for zooplankton quantification using a 250 um plankton net. Water quality monitoring needs to be continued on a regular basis over the long-term for greatest analytical results.

Management

Aquatic Vegetation Management - The 2011 management season focuses on the control of nuisance Southern Naiad growth with attention to additional macrophyte species such as Curly-leaf Pondweed and Variable Leaf Pondweed. Management for the 2011 season should rely on proven contact aquatic herbicides. It is more favorable for Mount Kemble Lake to use contact herbicides rather than a flouridone based herbicide such as Sonar whose design is to provide a sustained dosage with intent of a full lake treatment. Contact herbicides are more site selective and require less contact time on the plant for efficacy ensuring the preservation of areas that are non-problematic, which is more desirable from an ecological perspective.

Algae Control Treatments - Algae control treatments, if required, will be conducted to control excessive phytoplankton and filamentous algae growth. Planktonic and filamentous algae blooms are evidence of a nutrient imbalance and should be considered unacceptable and, therefore, mitigated. Previous years have shown that Mount Kemble Lake does not require large acreage of algae control therefore; aquatic algaecide Cutrine (chelated copper) should be applied for the 2011 management season for its ability to remain in the water column for more effective results while being less toxic on zooplankton populations. All surveys and treatments will include measurement of dissolved oxygen, water clarity, temperature and pH.

Prevention

Nutrient Inactivation Treatment – Efforts in the restoration of Mount Kemble Lake should focus on a nutrient inactivation treatment to bind phosphorus and other suspended particles in the water column to provide a nutrient barrier over lake sediments which will reduce sediment release of phosphorus. Water quality sampling has documented elevated phosphorus in the water column which is a main nutrient source of plant and algae growth. An Alum treatment can result in a dramatic improvement in water clarity which should last until the next significant water exchange period. Alum applied in the spring, prior to algal development can remove the algae's prime food source and limit plankton productivity. Previous application performed in 2008 was successful in creating greater water clarity and lower phosphorus levels which supports the initiative that this process can be considered operative on a bi-yearly basis.

External Nutrients –The external contribution of nutrients of Mount Kemble Lake could be the result of rainwater runoff from lawns treated with fertilizers or the inputs from waterfowl. Fertilizers typically contain a mixture of nutrients including nitrogen, phosphorus, and potassium. The addition of these nutrients causes excessive algae growth and decreases water clarity. The decay of algae leads to depleted oxygen in the water column effecting fish and zooplankton populations. With intentions to prevent excessive external loading, action should be taken through a community education program about the restricted use of phosphorus containing lawn fertilizers on plants or grass that will drain into the lake. In addition, if waterfowl are identified as inhabiting the lake area action should be taken to deter the species from further residence. Provided (http://www.morristwp.com/ordinances/Ord_29-09.pdf) is a link to the township of Morris ordinance which regulates the application of fertilizer in order to reduce the amount of external nutrients which enter their waterways.

We at Allied Biological genuinely appreciate the opportunity to assist in the lake management program at Mount Kemble Lake and look forward to being of service for the 2011 season.

Sincerely,

Joshua Burns
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APPENDIX

A: VASCULAR PLANT PICTURES
B: LAKE SURVEY REPORTS
C: PHYTOPLANKTON IDENTIFICATION AND ENUMERATION
D: LABORATORY RESULTS

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Appendix A

Vascular Plant Pictures and Descriptions

Southern Naiad (*Najas guadalupensis*. Common Names: Southern water nymph, bushy pondweed. **Native**.): Southern naiad is an annual aquatic plant that can form dense stands of rooted vegetation. Its ribbon-like leaves are dark-green to greenish-purple, and are wider and less pointed than slender naiad. Flowers occur at the base of the leaves, but are so small, they usually require magnification to detect. Southern naiad is widely distributed, but is less common than slender naiad in northern zones. Southern naiad reproduces by seeds and fragmentation.

Curly-leaf Pondweed (*Potamogeton crispus*. Common Name: curly-leaf pondweed. **Invasive.**): Curly-leaf pondweed has spaghetti-like stems that often reach the surface by mid-June. Its submersed leaves are oblong, and attached directly to the stem in an alternate pattern. The margins of the leaves are wavy and finely serrated, hence its name. No floating leaves are produced. Curly-leaf pondweed can tolerate turbid water conditions better than most other macrophytes. In late summer, Curly-leaf pondweed enters its summer dormancy stage. It naturally dies off (often creating a sudden loss of habitat and releasing nutrients into the water to fuel algae growth) and produces vegetative buds called turions. These turions germinate when the water gets cooler in the autumn and give way to a winter growth form that allows it to thrive under ice and snow cover, providing habitat for fish and invertebrates.

Variable-leaf Pondweed (*Potamogeton diversifolius*. Common Names: Water-thread pondweed, variable-leaf pondweed, snailseed pondweed. **Native**.): Variable-leaf pondweed have freely-branched stems emerging from slender rhizomes. The submersed leaves are narrow and linear with one obvious midvein bordered by a row of hollow cells. The floating leaves are shaped like an ellipse, but are usually less than 4 cm long, Variable-leaf pondweed fruit spikes are produced in two distinct forms. It occurs in lakes, ponds, rivers and streams and prefers soft sediment and water less than 2 meters deep. Waterfowl graze on the fruit, and local fauna often graze on the stems and leaves.

Common Waterweed (*Elodea Canadensis*: Common Names: elodea, common waterweed. **Native.**): Common waterweed has slender stems that can reach a meter in length, and a shallow root system. The stem is adorned with lance-like leaves that are attached directly to the stalk that tend to congregate near the stem tip. The leaves are populated by a variety of aquatic invertebrates. Male and female flowers occur on separate plants, but it can also reproduce via stem fragmentation. Since common waterweed is disease resistant, and tolerant to low-light conditions, it can reach nuisance levels, creating dense mats that can obstruct fish movement, and the operation of boat motors.

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Small Duckweed (*Lemna minor*. Common Names: Small duckweed, water lentil, lesser duckweed. **Native.**). Small duckweed is a free floating plant, with round to oval-shaped leaf bodies typically referred to as fronds. The fronds are small (typically less than 0.5 cm in diameter), and it can occur in large densities that can create a dense mat on the water's surface. Each frond contains three faint nerves, a single root (a characteristic used to distinguish it from other duckweeds), and no stem. Although it can produce flowers, it usually reproduces via budding at a tremendous rate. Its population can double in three to five days. Since it is free floating, it drifts with the wind or water current, and is often found intermixed with other duckweeds. Since it's not attached to the sediment, it derives nutrients directly from the water, and is often associated with eutrophic conditions. It over winters by producing turions late in the season. Small duckweed is extremely nutritious and can provide up to 90% of the dietary needs for waterfowl. It's also consumed by muskrat, beaver and fish, and dense mats of duckweed can actually inhibit mosquito breeding.

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Lake Survey Report

Mount Kemble Lake & Clubhouse pond

Contact

Contact: Don Kuhn

Phone: 973-425-1660

Fax:

Email: d.kuhn15@yahoo.com

Survey Information

Date: 5/13/2010

Time: 12:30:00 PM

Biologist: Rebecca Hamway

Survey Method: Boat

Findings

Alkalinity: 58 DO (ppm): 9.32 Secchi (Visibility in ft.): 7 pH: 7.5 Temperature(°F): 61

Aquatic Vegetation Species

Southern Naiad	*Najas guadalupensis*
Curlyleaf Pondweed	*Potamogeton crispus*

Algae Species

Filamentous Algae

(To view pictures of the plants surveyed, go to ***www.alliedbiological.com*** and click on the Plant Identification link at the bottom of the page.)

Comments

Trace to medium amount of Southern Naiad observed along majority of shoreline. Trace Curlyleaf Pondweed and Duckweed noted at the northern and southern ends of the lake. These plants were observed via rake toss approx. 5-10' off shore. No plants were observed from the boat and none reached the surface

No treatment conducted. Lake surveyed only.

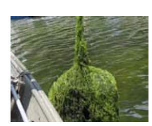
Plant Density Key

None

Trace

Sparse

Moderate



Dense

Allied Biological

580 Rockport Road • Hackettstown, NJ 07840 • 908-850-0303 • www.alliedbiological.com

Lake Survey Report

Mount Kemble Lake & Clubhouse pond

Contact

Contact: Don Kuhn

Phone: 973-425-1660

Fax:

Email: d.kuhn15@yahoo.com

Survey Information

Date: 6/24/2010

Time: 3:00:00 PM

Biologist: Jesse Kennek

Survey Method: 18' boat

Findings

Alkalinity: 108 DO (ppm): 9 Secchi (Visibility in ft.): 8 pH: 8 Temperature(°F): 84.2

Aquatic Vegetation Species

Southern Naiad *Najas guadalupensis*

Algae Species

Filamentous Algae

(To view pictures of the plants surveyed, go to ***www.alliedbiological.com*** and click on the Plant Identification link at the bottom of the page.)

Comments

Dense amount of Southern Naiad throughout lake. Plants are almost topped out at surface. Benthic and filamentous algae observed.

Treatments Conducted

Herbicide (Reward) and copper sulfate applied along the shoreline for control of pondweed and algae. Treatment notices were posted.

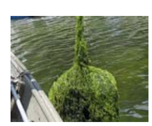
Plant Density Key


None


Trace


Sparse


Moderate


Dense

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Lake Survey Report

Mount Kemble Lake & Clubhouse pond

Contact

Contact: Don Kuhn

Phone: 973-425-1660

Fax:

Email: d.kuhn15@yahoo.com

Survey Information

Date: 7/15/2010

Time: 9:00:00 AM

Biologist: Wayne Horn

Survey Method: Boat

Findings

Alkalinity: 80 DO (ppm): 7 Secchi (Visibility in ft.): 7 pH: 8 Temperature(°F): 79

Aquatic Vegetation Species

Duckweed *Lemna sp.*

Southern Naiad *Najas guadalupensis*

Leafy Pondweed *Potamogeton foliosus*

Algae Species

(To view pictures of the plants surveyed, go to ***www.alliedbiological.com*** and click on the Plant Identification link at the bottom of the page.)

Comments

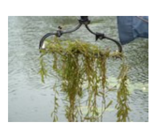
The beach area and western shoreline have trace amounts of leafy pondweed and southern naiad scattered along the shoreline, in and around the docks. Trace amounts of duckweed were wind blown on the lake's surface. No algae was found.

The western shoreline and beach area were treated with Reward to control southern naiad.

Plant Density Key


None


Trace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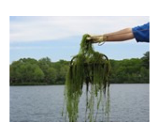
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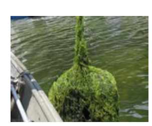
Dense

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Lake Survey Report

Mount Kemble Lake & Clubhouse pond

Mount Kemble Lake

Contact

Contact: Don Kuhn

Phone: 973-425-1660

Fax:

Email: d.kuhn15@yahoo.com

Survey Information

Date: 8/11/2010

Time: 9:20:00 AM

Biologist: Wayne Horn

Survey Method: Boat

Findings

Alkalinity: 92 DO (ppm): 6 Secchi (Visibility in ft.): 9 pH: 8 Temperature(°F): 78.8

Aquatic Vegetation Species

Southern Naiad *Najas guadalupensis*

Duckweed *Lemna sp.*

Algae Species

Filamentous Algae

(To view pictures of the plants surveyed, go to ***www.alliedbiological.com*** and click on the Plant Identification link at the bottom of the page.)

Comments

One small patch (2ftx2ft) of floating filamentous algae was found just north of the beach. Southern naiad is dead or decaying from the 7/15 Reward treatment. Trace amounts of duckweed were found at both the inlet and outlet end of the lake. The water is clean and clear. Overall the lake is good condition.

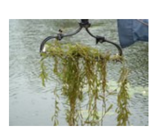
Treatments Conducted

No treatment was necessary at this time.

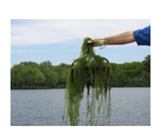
Plant Density Key

None

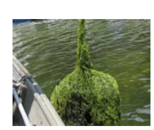
Trace



Sparse



Moderate



Dense

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Lake Survey Report

Mount Kemble Lake & Clubhouse pond

Contact

Contact: Don Kuhn

Phone: 973-425-1660

Fax:

Email: d.kuhn15@yahoo.com

Survey Information

Date: 9/10/2010

Time: 1:00:00 PM

Biologist: Rebecca Hamway

Survey Method: Boat

Findings

Alkalinity: 84 DO (ppm): 7.54 Secchi (Visibility in ft.): 9 pH: 8 Temperature(°F): 72.5

Aquatic Vegetation Species

Southern Naiad *Najas guadalupensis*

Small Duckweed *Lemna minor*

Algae Species

Filamentous Algae

(To view pictures of the plants surveyed, go to ***www.alliedbiological.com*** and click on the Plant Identification link at the bottom of the page.)

Comments

Dense Southern Naiad and trace amounts of Small Duckweed observed by the inlet. Naiad became less dense further south into the lake. The entire southern half of the lake appeared clean and clear, as did the beach area.

Treatments Conducted

No treatment. Lake survey only.

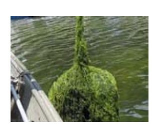
Plant Density Key

None

Trace

Sparse

Moderate



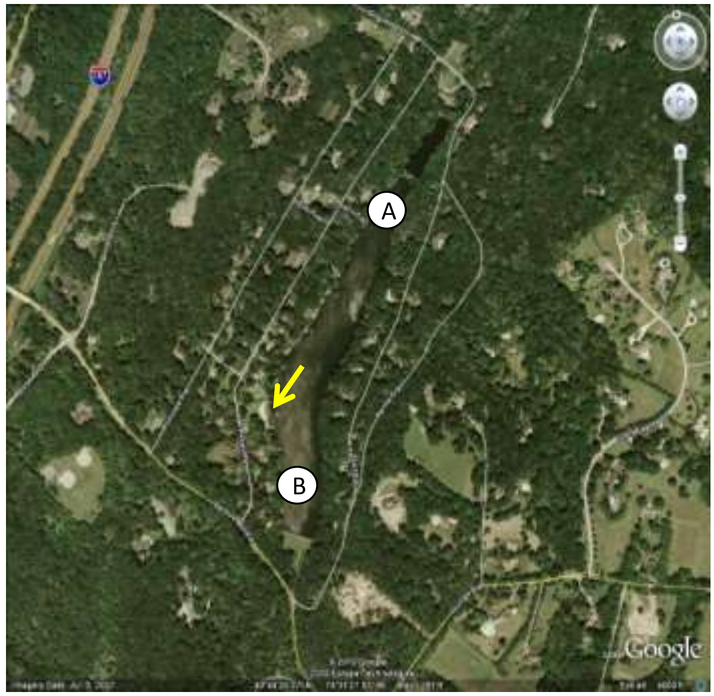
Dense

Mount Kemble Lake

Date:	5/13/2010
Biologist:	RH

Site: A **Lake Station**

Depth (meters)	Temp. (ºC)	Dissolved Oxygen (mg/L)
0	16.9	9.32
1	15.4	9.47
2	14.4	9.58
3	13.8	9.25
4	11.8	7.12
5	9.9	1.56
6	8.1	0.15
7	7.6	0.11
8	7.4	0.10
9	7.2	0.08
10		
11		
12		



Total Depth (m):	9.0
Secchi (m):	2.20
pH:	7.50

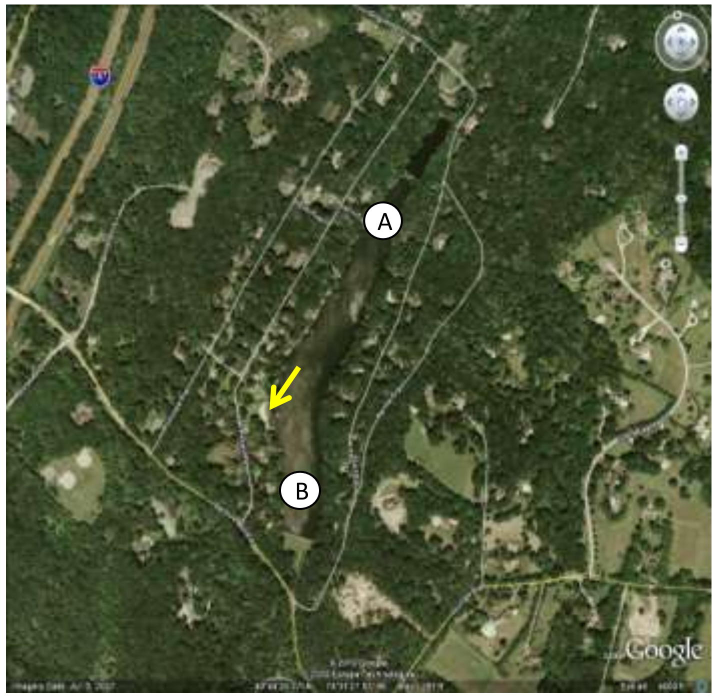
Notes: Conducted at Lake Station

Mount Kemble Lake

Date:	7/16/2010
Biologist:	RH/JB

Site: A **Lake Station**

Depth (meters)	Temp. (ºC)	Dissolved Oxygen (mg/L)
0	28.2	8.74
1	27.4	8.91
2	26.9	8.22
3	25.8	2.58
4	21.2	0.31
5	17.1	0.27
6	11.5	0.25
7	9.5	0.24
8	8.4	0.21
9	8.3	0.19
10		
11		
12		



Total Depth (m):	9.0
Secchi (m):	1.60
pH:	8.00

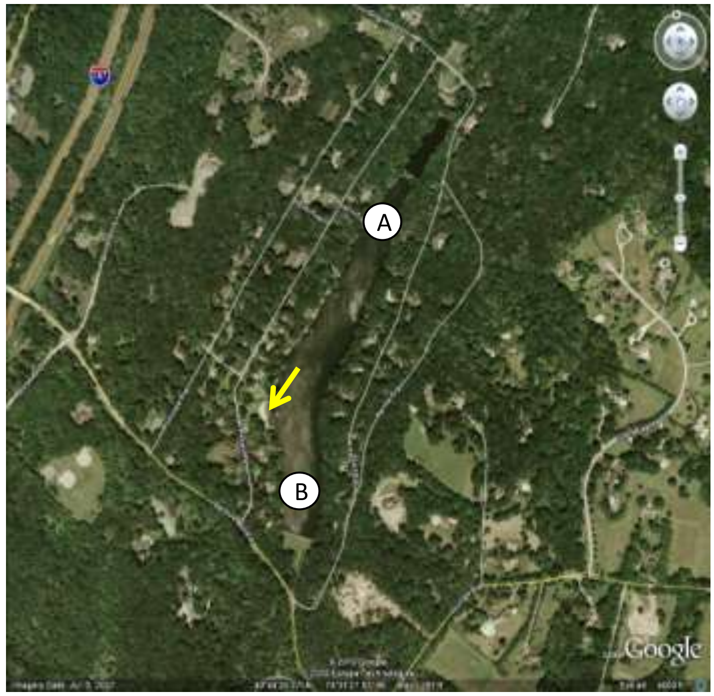
Notes: Conducted at Lake Station

Mount Kemble Lake

Date:	9/10/2010
Biologist:	RH

Site: A **Lake Station**

Depth (meters)	Temp. (ºC)	Dissolved Oxygen (mg/L)
0	22.8	9.32
1	22.8	9.47
2	22.5	9.58
3	22.3	9.25
4	22.3	7.12
5	21.8	1.56
6	18.4	0.15
7	12.8	0.11
8		
9		
10		
11		
12		



Total Depth (m):	9.0
Secchi (m):	2.20
pH:	7.50

Notes: Conducted at Lake Station

MICROSCOPIC EXAMINATION OF WATER

Sample from: Mount Kemble Lake

Collection Date: May 13, 2010	**Examination Date: May 14, 2010**	**Amount Examined:** 200 ml.
Site A : Inlet Site	**Site B: Outlet**	**Site C:**

BACILLARIOPHYTA (Diatoms)	A	B	C
Asterionella	230	350	
Cocconeis			
Cyclotella			
Cymbella			
Diatoma			
Fragilaria			
Melosira			
Meridion			
Navicula	330	640	
Pinnularia	50	10	
Rhizosolenia			
Stephanodiscus			
Synedra		30	
Stauroneis	100	60	
Tabellaria		10	
Total Diatoms	**710**	**1100**	**0**

CHRYSOPHYTA (Golden Algae)	A	B	C
Dinobryon	10	70	
Mallomonas	60		
Synura			
Tribonema			
Uroglenopsis			
Vaucheria			
Total Golden Algae	**70**	**70**	**0**

PROTOZOA	A	B	C
Actinophrys			
Vorticella			
Total Protozoa	**0**	**0**	**0**

CHLOROPHYTA (Green Algae)	A	B	C
Actinastrum			
Ankistrodesmus			
Chlamydomonas			
Chlorella	150	320	
Chlorococcum			
Closterium			
Coelastrum			
Cosmarium			
Desmodium			
Eudorina			
Gloeocystis			
Micrasterias			
Micratinium			
Microspora			
Mougeotia			
Oedogonium			
Oocystis			
Pandorina			
Pediastrum			
Phytoconis	50		
Rhizoclonium			
Scenedesmus	20	50	
Sphaerocystis			
Spirogyra			
Staurastrum			
Tetraedron			
Ulothrix			
Volvox			
Total Green Algae	**220**	**370**	**0**

CYANOPHYTA (Blue-green Algae)	A	B	C
Anabaena			
Anacystis			
Aphanizomenon			
Coelosphaerium			
Cylindrospermum			
Gomphosphseria			
Lyngbya			
Microcystis			
Nostoc			
Oscillatoria			
Pseudoanabaena			
Synechocystis			
Total Blue-green Algae	**0**	**0**	**0**

EUGLENOPHYTA (Euglenoids)	A	B	C
Euglena	10		
Lepocinclis			
Phacus			
Trachelomonas			
Total Euglenoids	**10**	**0**	**0**

PYRRHOPHYTA (Dinoflagellates)	A	B	C
Ceratium			
Peridinium	30	10	
Total Dinoflagellates	**30**	**10**	**0**

SITE	A	B	C
TOTAL GENERA:	11	10	
TRANSPARENCY:	6.5 ft. est.	7 ft.	
ORGANISMS PER MILLILITER:	**1040**	**1550**	**0**

Notes: This was the first sampling event at Mount Kemble Lake in 2010. Both algal density and diversity were high at the two sites. The assemblage at the lake was dominated by a mixture of diatoms. Some green algae and trace amounts of golden algae, dinoflagellates and euglenoids (Inlet site only) were also observed. Water clarity was considered good at both sites.

MICROSCOPIC EXAMINATION OF WATER

Sample from: Mount Kemble Lake

Collection Date: July 16, 2010 | **Examination Date: July 16, 2010** | **Amount Examined:** 200 ml.

Site A : Inlet Site | **Site B: Outlet Site** | **Site C:**

BACILLARIOPHYTA (Diatoms)	A	B	C
Asterionella			
Cocconeis			
Cyclotella			
Cymbella			
Diatoma			
Fragilaria			
Melosira			
Meridion			
Navicula			
Pinnularia			
Rhizosolenia			
Stephanodiscus			
Synedra			
Stauroneis			
Tabellaria			
Total Diatoms	**0**	**0**	**0**

CHRYSOPHYTA (Golden Algae)	A	B	C
Dinobryon			
Mallomonas	10		
Synura			
Tribonema			
Uroglenopsis			
Vaucheria			
Total Golden Algae	**10**	**0**	**0**

PROTOZOA	A	B	C
Actinophrys			
Vorticella			
Total Protozoa	**0**	**0**	**0**

CHLOROPHYTA (Green Algae)	A	B	C
Actinastrum			
Ankistrodesmus			
Chlamydomonas			
Chlorella			
Chlorococcum			
Closterium			
Coelastrum	10		
Cosmarium			
Desmodium			
Eudorina			
Gloeocystis			
Micrasterias			
Micratinium			
Microspora			
Mougeotia			
Oedogonium			
Oocystis			
Pandorina			
Pediastrum			
Phytoconis			
Rhizoclonium			
Scenedesmus			
Sphaerocystis			
Spirogyra			
Staurastrum			
Tetraedron			
Ulothrix			
Volvox			
Total Green Algae	**10**	**0**	**0**

CYANOPHYTA (Blue-green Algae)	A	B	C
Anabaena			
Anacystis			
Aphanizomenon			
Coelosphaerium			
Cylindrospermum			
Gomphosphseria			
Lyngbya			
Microcystis			
Nostoc			
Oscillatoria			
Pseudoanabaena			
Synechocystis			
Total Blue-green Algae	**0**	**0**	**0**

EUGLENOPHYTA (Euglenoids)	A	B	C
Euglena	10		
Lepocinclis			
Phacus			
Trachelomonas	100	90	
Total Euglenoids	**110**	**90**	**0**

PYRRHOPHYTA (Dinoflagellates)	A	B	C
Ceratium			
Peridinium	70	70	
Total Dinoflagellates	**70**	**70**	**0**

SITE	A	B	C
TOTAL GENERA:	5	2	
TRANSPARENCY:	6 ft. est.	5 ft.	
ORGANISMS PER MILLILITER:	**200**	**160**	**0**

Notes: Algal density at both sites is considered light and favorable with moderate diversity at the inlet and low diversity at the outlet site. The algal density at each site has decreased significantly since the last sampling event. Each assemblage is a mixture of euglenoids and dinoflagellates. Trace golden algae and green algae were also observed at the inlet site. Water clarity is considered fair to good at each site.

Allied Biological

MICROSCOPIC EXAMINATION OF WATER

Sample from: Mount Kemble Lake

Collection Date: Sept 10, 2010	**Examination Date: Sept 10, 2010**	**Amount Examined:** 200 ml.
Site A : Inlet Site	**Site B: Outlet Site**	**Site C:**

BACILLARIOPHYTA (Diatoms)	**A**	**B**	**C**
Asterionella			
Cocconeis			
Cyclotella	10	30	
Cymbella			
Diatoma			
Fragilaria	20		
Melosira			
Meridion			
Navicula	10		
Pinnularia			
Rhizosolenia			
Stephanodiscus			
Synedra			
Stauroneis			
Tabellaria			
Total Diatoms	**40**	**30**	**0**

CHRYSOPHYTA (Golden Algae)	**A**	**B**	**C**
Dinobryon			
Mallomonas		30	
Synura			
Tribonema			
Uroglenopsis			
Vaucheria			
Total Golden Algae	**0**	**30**	**0**

PROTOZOA	**A**	**B**	**C**
Actinophrys			
Vorticella			
Total Protozoa	**0**	**0**	**0**

CHLOROPHYTA (Green Algae)	**A**	**B**	**C**
Actinastrum			
Ankistrodesmus			
Chlamydomonas			
Chlorella		50	
Chlorococcum			
Closterium			
Coelastrum	20	110	
Cosmarium			
Desmodium			
Eudorina			
Gloeocystis			
Micrasterias			
Micratinium			
Microspora			
Mougeotia			
Oedogonium			
Oocystis	10		
Pandorina			
Pediastrum			
Phytoconis			
Rhizoclonium			
Scenedesmus	30	40	
Sphaerocystis	60	150	
Spirogyra			
Staurastrum	10	30	
Tetraedron			
Ulothrix			
Volvox			
Total Green Algae	**130**	**380**	**0**

CYANOPHYTA (Blue-green Algae)	**A**	**B**	**C**
Anabaena	10	50	
Anacystis		10	
Aphanizomenon			
Coelosphaerium			
Cylindrospermum			
Gomphosphseria			
Lyngbya			
Microcystis			
Nostoc			
Oscillatoria			
Pseudoanabaena			
Synechocystis			
Total Blue-green Algae	**10**	**60**	**0**

EUGLENOPHYTA (Euglenoids)	**A**	**B**	**C**
Euglena		10	
Lepocinclis			
Phacus			
Trachelomonas	30	130	
Total Euglenoids	**30**	**140**	**0**

PYRRHOPHYTA (Dinoflagellates)	**A**	**B**	**C**
Ceratium			
Peridinium	20	10	
Total Dinoflagellates	**20**	**10**	**0**

SITE	**A**	**B**	**C**
TOTAL GENERA:	11	13	
TRANSPARENCY:	9 ft. est.	9 ft.	
ORGANISMS PER MILLILITER:	**230**	**650**	

Notes: Algal density has increased at both sites and is considered low to moderate with high diversity. Each assemblage was dominated by green algae. Diatoms, blue-green algae, euglenoids, and dinoflagellates were observed at each site. Trace golden algae and protozoa were also observed at the outlet site. Water clarity is considered excellent at each site.

APL
AQUA PRO-TECH LABORATORIES

CERTIFICATIONS
NJ DEP 07010 / NY DOH 11634 / CT PH-0233
US ARMY CORPS (USACE)

ANALYTICAL RESULTS SUMMARY

Client	**Allied Biological Inc** 580 Rockport Rd. Hackettstown, NJ 07840	**APL Order ID Number**	**10050442**
		Date Sampled	05/13/2010 12:55
		Date Received	05/13/2010 16:08
Contact	Chris Doyle	**Matrix**	Lake
Project		**Site**	Mt Kemble Lake
Report Date	05/27/2010 16:28	**Customer Service Rep.**	

Sample Number/ Parameter	Method	Analysis Time	Analyst	Result	Units	MDL
10050442-001 Inlet						
Ammonia	SM 4500NH3C	05/18/2010 13:30	YKIZNER	<0.2	mg/L	0.2
Conductivity	SM 2510B	05/17/2010 9:00	JVAGHELA	266	µmhos/cm	1
Nitrate as N	EPA 300	05/14/2010 17:15	ASTOICA	0.6	mg/L	0.2
Phosphorus, Total	SM4500P-E	05/25/2010 9:00	YKIZNER	0.02	mg/L	0.01
Total Suspended Solids (TSS)	EPA 160.2/ SM 2540 D	05/19/2010 18:30	ASTOICA	<3	mg/L	3
10050442-002 Outlet Surface						
Ammonia	SM 4500NH3C	05/18/2010 13:30	YKIZNER	<0.2	mg/L	0.2
Conductivity	SM 2510B	05/17/2010 9:00	JVAGHELA	266	µmhos/cm	1
Nitrate as N	EPA 300	05/14/2010 17:15	ASTOICA	0.6	mg/L	0.2
Phosphorus, Total	SM4500P-E	05/25/2010 9:00	YKIZNER	0.02	mg/L	0.01
Total Suspended Solids (TSS)	EPA 160.2/ SM 2540 D	05/19/2010 18:30	ASTOICA	<3	mg/L	3
10050442-003 Outlet Bottom						
Ammonia	SM 4500NH3C	05/18/2010 13:30	YKIZNER	<0.2	mg/L	0.2
Conductivity	SM 2510B	05/17/2010 9:00	JVAGHELA	246	µmhos/cm	1
Nitrate as N	EPA 300	05/14/2010 17:15	ASTOICA	0.3	mg/L	0.2
Phosphorus, Total	SM4500P-E	05/25/2010 9:00	YKIZNER	0.03	mg/L	0.01
Total Suspended Solids (TSS)	EPA 160.2/ SM 2540 D	05/19/2010 18:30	ASTOICA	9	mg/L	3

SA: See attached report

Brian Wood
Laboratory Director

QA

APL
AQUA PRO-TECH LABORATORIES

CERTIFICATIONS
NJ DEP 07010 / NY DOH 11634 / CT PH-0233
US ARMY CORPS (USACE)

ANALYTICAL RESULTS SUMMARY

Client	**Allied Biological Inc** 580 Rockport Rd. Hackettstown, NJ 07840	**APL Order ID Number**	**10070615**
		Date Sampled	07/16/2010 12:56
		Date Received	07/16/2010 14:27
Contact	C. Doyle	**Matrix**	Lake
Project		**Site**	Mt Kemble Lake
Report Date	08/04/2010 8:08	**Customer Service Rep.**	

Sample Number/ Parameter	Method	Analysis Time	Analyst	Result	Units	MDL
10070615-001 Inlet						
Ammonia	SM 4500NH3C	07/26/2010 15:00	YKIZNER	<0.2	mg/L	0.2
Conductivity	SM 2510B	07/21/2010 11:00	JVAGHELA	300	µmhos/cm	1
Nitrate as N	EPA 300	07/16/2010 22:22	ASTOICA	<0.2	mg/L	0.2
Phosphorus, Total	SM4500P-E	07/27/2010 10:00	YKIZNER	0.01	mg/L	0.01
Total Suspended Solids	EPA 160.2/ SM 2540 D	07/22/2010 17:30	ASTOICA	6	mg/L	3
10070615-002 Outlet Surface						
Ammonia	SM 4500NH3C	07/26/2010 15:00	YKIZNER	0.37	mg/L	0.2
Conductivity	SM 2510B	07/21/2010 11:00	JVAGHELA	289	µmhos/cm	1
Nitrate as N	EPA 300	07/16/2010 22:22	ASTOICA	<0.2	mg/L	0.2
Phosphorus, Total	SM4500P-E	07/27/2010 10:00	YKIZNER	0.02	mg/L	0.01
Total Suspended Solids	EPA 160.2/ SM 2540 D	07/22/2010 17:30	ASTOICA	7	mg/L	3
10070615-003 Outlet Bottom						
Ammonia	SM 4500NH3C	07/26/2010 15:00	YKIZNER	<0.2	mg/L	0.2
Conductivity	SM 2510B	07/21/2010 11:00	JVAGHELA	262	µmhos/cm	1
Nitrate as N	EPA 300	07/16/2010 22:22	ASTOICA	<0.2	mg/L	0.2
Phosphorus, Total	SM4500P-E	07/27/2010 10:00	YKIZNER	0.03	mg/L	0.01
Total Suspended Solids	EPA 160.2/ SM 2540 D	07/22/2010 17:30	ASTOICA	11	mg/L	3

SA: See attached report

Brian Wood
Brian Wood
Laboratory Director

QA

APL
AQUA PRO-TECH LABORATORIES

CERTIFICATIONS

NJ DEP 07010 / NY DOH 11634 / CT PH-0233
US ARMY CORPS (USACE)

ANALYTICAL RESULTS SUMMARY

Client	**Allied Biological Inc** 580 Rockport Rd. Hackettstown, NJ 07840	**APL Order ID Number**	**10090354**
		Date Sampled	09/10/2010 13:11
		Date Received	09/10/2010 14:51
Contact	Chris Doyle	**Matrix**	Lake
Project		**Site**	Mt Kemble Lake
Report Date	09/22/2010 8:10	**Customer Service Rep.**	

Sample Number/ Parameter	Method	Analysis Time	Analyst	Result	Units	MDL
10090354-001 Inlet						
Ammonia	SM 4500NH3C	09/16/2010 11:00	YKIZNER	<0.2	mg/L	0.2
Conductivity	SM 2510B	09/21/2010 15:00	YKIZNER	270	µmhos/cm	1
Nitrate as N	EPA 300	09/11/2010 6:22	ASTOICA	<0.2	mg/L	0.2
Phosphorus, Total	SM4500P-E	09/17/2010 9:00	YKIZNER	0.02	mg/L	0.01
Total Suspended Solids	EPA 160.2/ SM 2540 D	09/17/2010 17:45	MARK	<3	mg/L	3
10090354-002 Outlet Surface						
Ammonia	SM 4500NH3C	09/16/2010 11:00	YKIZNER	<0.2	mg/L	0.2
Conductivity	SM 2510B	09/21/2010 15:00	YKIZNER	261	µmhos/cm	1
Nitrate as N	EPA 300	09/11/2010 6:22	ASTOICA	<0.2	mg/L	0.2
Phosphorus, Total	SM4500P-E	09/17/2010 9:00	YKIZNER	0.03	mg/L	0.01
Total Suspended Solids	EPA 160.2/ SM 2540 D	09/17/2010 17:45	MARK	<3	mg/L	3
10090354-003 Outlet Bottom						
Ammonia	SM 4500NH3C	09/16/2010 11:00	YKIZNER	<0.2	mg/L	0.2
Conductivity	SM 2510B	09/21/2010 15:00	YKIZNER	272	µmhos/cm	1
Nitrate as N	EPA 300	09/11/2010 6:22	ASTOICA	<0.2	mg/L	0.2
Phosphorus, Total	SM4500P-E	09/17/2010 9:00	YKIZNER	0.04	mg/L	0.01
Total Suspended Solids	EPA 160.2/ SM 2540 D	09/17/2010 17:45	MARK	<3	mg/L	3

SA: See attached report

Brian Wood

Brian Wood
Laboratory Director

QA

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