

# 2008-09 FINAL REPORT

## *Lake Wallenpaupack Water Quality Monitoring Program*



*April 20, 2011*

*Prepared for:*



**Lake Wallenpaupack Watershed  
Management District**

*P.O. Box 143  
Hawley, PA 18428*

*Prepared by:*

 **Aqua Link, Inc.**

*Pond, Lake & Stream Management & Supplies*

*P.O. Box 605  
Doylestown, PA 18901*

*Ph: 215.230.9325*

*www.aqualinkinc.com*

## TABLE OF CONTENTS

<u>Section No.</u>	<u>Page</u>
ACKNOWLEDGEMENTS .....	iv
EXECUTIVE SUMMARY .....	v
1. INTRODUCTION .....	1
2. LAKE WATER QUALITY MONITORING PROGRAM.....	2
3. LOCAL CLIMATOLOGICAL DATA .....	4
4. LAKE WATER QUALITY DATA RESULTS FOR 2008-09 .....	6
4.1. TEMPERATURE AND DISSOLVED OXYGEN.....	6
4.2. PH & ALKALINITY .....	7
4.3. PHOSPHORUS .....	11
4.4. NITROGEN .....	13
4.5. SECCHI DISK TRANSPARENCY & CHLOROPHYLL-A.....	14
4.6. TOTAL SUSPENDED SOLIDS.....	15
4.7. PHYTOPLANKTON & ZOOPLANKTON BIOMASS .....	16
4.7.1. <i>Phytoplankton</i> .....	17
4.7.2. <i>Zooplankton</i> .....	18
4.8. CARLSON'S TROPHIC STATE INDEX VALUES.....	21
4.9. SUMMARY OF LAKE ASSESSMENT DATA .....	22
5. HISTORICAL LAKE WATER QUALITY TRENDS.....	23
5.1. PHOSPHORUS .....	23
5.2. NITROGEN .....	24
5.3. SECCHI TRANSPARENCY .....	24
5.4. CHLOROPHYLL-A .....	24
5.5. PHYTOPLANKTON & ZOOPLANKTON BIOMASS .....	28
5.6. CARLSON TROPHIC STATE INDEX VALUES.....	28
5.7. SUMMARY OF HISTORICAL LAKE DATA .....	30
6. CONCLUSIONS AND RECOMMENDATIONS .....	30
7. LITERATURE CITED .....	33

**Appendices**

- Appendix A Glossary of Lake and Watershed Management Terms
- Appendix B Primer on Lake Ecology & Watershed Concepts
- Appendix C Lake Water Quality Data for 2008-09

**Cover Page**

Picture of Lake Wallenpaupack taken from dock at Spinnler Point Community Association taken by Ed Molesky of Aqua Link.

**List of Tables**

<b><u>Table No.</u></b>	<b><u>Page</u></b>
Table 4.1 Mean pH & Alkalinity Concentrations at Station 3 in 2008-09.....	11
Table 4.2 Mean Phosphorus Concentrations at Station 3 in 2008-09.....	12
Table 4.3 Mean Nitrogen Concentrations at Station 3 in 2008-09.....	14
Table 4.4 Mean Secchi & Chlorophyll-a Values at Station 3 in 2008-09.....	15
Table 4.5 Mean Total Suspended Solids Concentrations at Station 3 in 2008-09.....	16
Table 4.6 Mean Carlson’s TSI Values at Station 3 in 2008-09.....	22

## List of Figures

<u>Figure No.</u>	<u>Page</u>
Figure 1.1 Lake Wallenpaupack Watershed .....	1
Figure 2.1 Lake Monitoring Stations .....	3
Figure 3.1 Historical Air Temperature Data in the Lake Wallenpaupack Region.....	5
Figure 3.2 Historical Precipitation Data in the Lake Wallenpaupack Region.....	5
Figure 4.1 Water Temperature Profiles at Station 3 in 2008 .....	8
Figure 4.2 Water Temperature Profiles at Station 3 in 2009 .....	8
Figure 4.3 Dissolved Oxygen Profiles at Station 3 in 2008 .....	9
Figure 4.4 Dissolved Oxygen Profiles at Station 3 in 2009 .....	9
Figure 4.5 Phytoplankton Biomass at Station 3 in 2008 .....	19
Figure 4.6 Phytoplankton Biomass at Station 3 in 2009 .....	19
Figure 4.7 Zooplankton Biomass at Station 3 in 2008 .....	20
Figure 4.8 Zooplankton Biomass at Station 3 in 2009 .....	20
Figure 5.1 Historical Total Phosphorus Concentrations in Surface Waters .....	25
Figure 5.2 Historical Total Phosphorus Concentrations in Bottom Waters .....	25
Figure 5.3 Historical Total Nitrogen Concentrations in Surface Waters.....	26
Figure 5.4 Historical Total Nitrogen Concentrations in Bottom Waters.....	26
Figure 5.5 Historical Secchi Disk Transparency .....	27
Figure 5.6 Historical Chlorophyll-a Concentrations.....	27
Figure 5.7 Historical Phytoplankton Biomass.....	28
Figure 5.8 Historical Zooplankton Biomass .....	29
Figure 5.9 Historical Carlson's TSI Values .....	29

## ***ACKNOWLEDGEMENTS***

Aqua Link would like to extend its appreciation to the Directors of the Lake Wallenpaupack Watershed Management District (LWWMD) and their organizations for their strong commitment and dedication in protecting and improving the water quality of Lake Wallenpaupack and all of its tributaries throughout Pike, Wayne, Lackawanna and Monroe Counties. Special thanks are extended to Mr. Nick Spinelli, LWWMD Executive Director, for all of his assistance throughout the duration of this project.

### ***2011 LWWMD Board of Directors***

Alex Zidock, Chairman Representative - Pike County at Large  
Pete Snyder, Vice Chairman & Representative - Wayne Conservation District  
Karl Eisenhower, Secretary & Representative - Wayne County at Large  
Charles Sexton, Treasurer & Representative- LWWA  
Trish Attardo, Representative - Monroe County at Large  
Pete Bochnovich, Representative at Large  
Richard Caridi, Representative - Pike County Commissioner  
Bruce Chandler, Representative-Wayne County Supervisor  
Coulby Dunn, Representative - Pike County at Large  
Eric Ernhardt, Representative - Pike County Supervisor  
Carolyn Gwozdziejewicz, Representative - Wayne County at Large  
Pete Helms, Representative - Pike County Conservation District  
Wendell Kay, Representative -Wayne County Commissioner  
Kathleen Lester, Representative - PPL Corporation  
Tom Mueller, Representative - Marine Trades Association  
Fred C. Schoenagel, Jr., Representative at Large  
Brian Schan, Representative - Sewage Treatment Plant  
John Senio, Representative - Lackawanna County at Large  
Mark Reidenbach, Representative at Large

### ***LWWMD Executive Director***

Nick Spinelli

### ***LWWMD Solicitor***

R. Anthony Waldron

## ***EXECUTIVE SUMMARY***

Lake Wallenpaupack, a 5,700-acre reservoir, is an extremely valuable multi-recreational and economic resource for Northeastern Pennsylvania. The lake is nestled within the Pocono Mountains in Pike and Wayne Counties. Lake Wallenpaupack is used extensively for a wide variety of water-related activities including swimming, fishing, boating, water skiing, and snowmobiling.

Over the years, the water quality of Lake Wallenpaupack has been routinely monitored since 1980. In 2010, the Lake Wallenpaupack Watershed Management District retained Aqua Link to analyze the 2008 and 2009 lake water quality data and prepare the 2008-09 annual report. As part of this report, Aqua Link also compared the 2008 and 2009 to the historical data collected from 1980 through 2007 to determine whether lake water quality has improved or degraded over the past 30 years.

Lake Wallenpaupack was classified as a slightly eutrophic reservoir in 2008 and 2009. The mean Carlson TSI values for total phosphorus, chlorophyll-a, and Secchi disk transparency were 49, 55, and 50, respectively, for 2008. The 2009 values were 49, 53, and 55, respectively. The lake was thermally stratified in 2008 and 2009 from May through September. In turn, the dissolved oxygen concentrations were strongly stratified when the lake was thermally stratified. Phytoplankton data indicate that blue-green algae (Cyanophyta) are dominant during the months of July through September in 2008 and 2009. The most common genus was *Anabaena*.

Based upon trend analysis, the water quality of Lake Wallenpaupack has generally improved since 1980. Total phosphorus concentrations in surface and bottom waters and Secchi transparency (water clarity) have gradually improved. Total nitrogen concentrations in surface and bottom waters marginally increased along with chlorophyll-a concentrations and phytoplankton biomass.

Over the past 30 years, water clarity (Secchi transparency) increased although chlorophyll-a and phytoplankton biomass have slightly increased. This appears to be related to a shift in the phytoplankton community, where blue-green algal dominance is less prevalent. The shift in the phytoplankton community may be attributed to decreases in total phosphorus and increases in total nitrogen in the lake. In general, higher nitrogen to phosphorus concentration ratios in lakes often favor green (Chlorophyta) over blue-green (Cyanophyta) algae. In general, higher nitrogen to phosphorus concentration ratios in lakes often favor green (Chlorophyta) over blue-green algae resulting in more species diversity and improved water clarity and aesthetics.

**Lake Water Quality Monitoring Program for 2008-09  
Lake Wallenpaupack Watershed Management District**

---

Based upon the 2008-09 lake data, Aqua Link offers the following recommendations to the District for 2011:

- Aqua Link should be retained to analyze the 2010 lake water quality data and prepare the annual lake report.
- Aqua Link should be retained by the District to assist in all lake monitoring activities in 2011.
- ECM, Inc. should be retained as the contract laboratory for all water quality analysis using the Method Detection Limits (MDL) as established by Aqua Link.
- All phytoplankton and zooplankton samples should continue to be analyzed using the same methods used by Dr. Kenneth Wagner in 2010 as recommended by Aqua Link.
- The lake should be monitored at Stations 3 and 5 in 2011. These stations should be monitored at least monthly from May through October for the parameters recommended by Aqua Link.

## 1. Introduction

Lake Wallenpaupack, a 5,700-acre reservoir, is an extremely valuable multi-recreational and economic resource for Northeastern Pennsylvania. The lake is nestled within the Pocono Mountains in Pike and Wayne Counties. Lake Wallenpaupack is used extensively for a wide variety of water-related activities including swimming, fishing, boating, water skiing, and snowmobiling. Lake Wallenpaupack is within vacationing distance of millions of inhabitants of the mid Atlantic states. Philadelphia, New York City, Trenton, Scranton and Wilkes-Barre are all located within 100 miles of Lake Wallenpaupack, and the lake receives substantial use by these city residents. The Lake Wallenpaupack watershed is quite extensive and encompasses 219 square miles spread over four counties and 14 townships as shown in Figure 1.1 (LWWMD website at [www.wallenpaupackwatershed.org](http://www.wallenpaupackwatershed.org)).

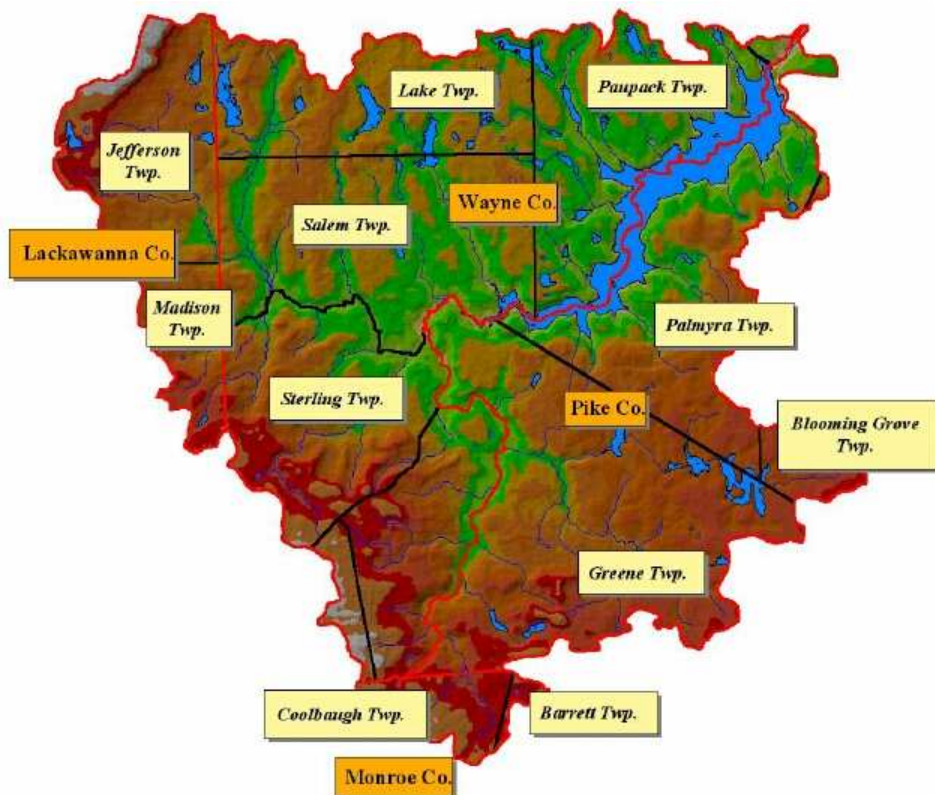


Figure 1.1 Lake Wallenpaupack Watershed



In 1926, the Pennsylvania Power & Light Co. (PP&L) dammed the creek and built the lake to supply water for a hydroelectric power plant. Building the lake was a monumental task, considering that mules and steam engines were the only source of power for construction projects in those days. It took 2,700 people about two years to do the job. Farms, barns and houses in the lake bed were demolished or moved, trees were cut down, utility poles and 17 miles of roadway were moved, and a cemetery was relocated. Wallenpaupack Creek was rerouted while the concrete dam was being built. PP&L also built a dike in Tafton to impound Wallenpaupack Creek. Once the dam and dike were completed, the stream was allowed to resume its course and fill the lake with water (LWWMD website at [www.wallenpaupackwatershed.org](http://www.wallenpaupackwatershed.org)).

Over the years, the water quality of Lake Wallenpaupack has been routinely monitored since 1980. In 2010, the Lake Wallenpaupack Watershed Management District (hereinafter referred to as the LWWMD) retained Aqua Link to analyze the 2008 and 2009 lake water quality data and prepare this report, which provides our conclusions and recommendations. As part of this report, Aqua Link also compared the 2008 and 2009 to the historical data collected from 1980 through 2007 to determine whether lake water quality has improved or degraded over the past 30 years.

In order to prepare the 2008-09 Report, Aqua Link first needed to develop a historical water quality database for all lake data collected from 1980 through 2007. The District retained Aqua Link to develop this historical lake water quality database under a separate contract. The newly created historical water quality database served as the foundation for this report and will subsequently be used to analyze all newly acquired lake water quality data.

## **2. Lake Water Quality Monitoring Program**

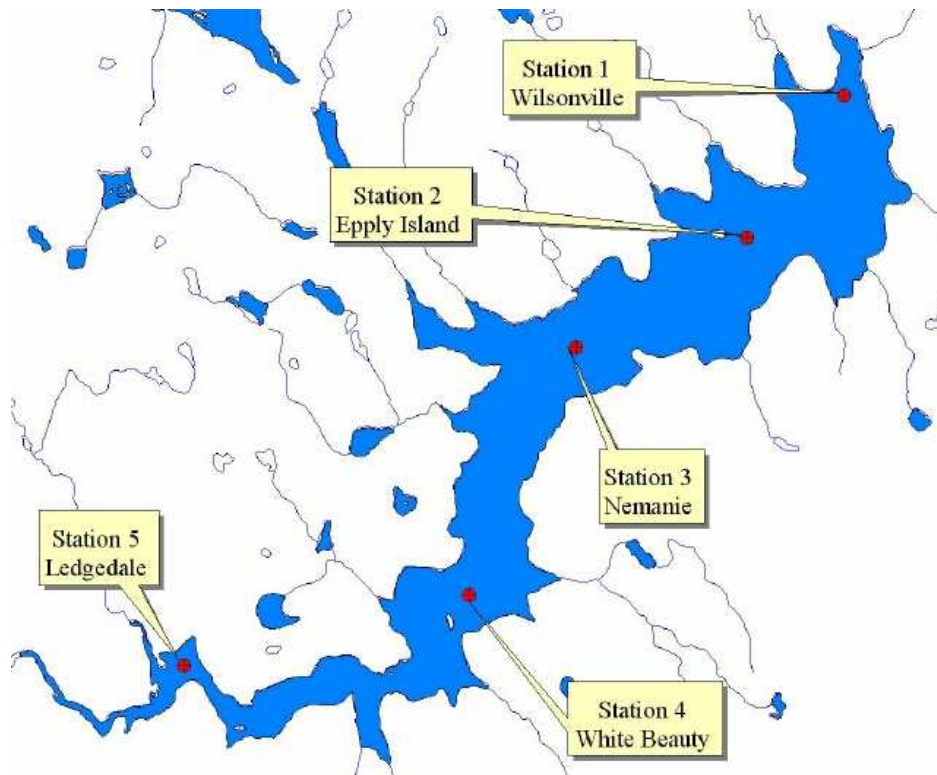
LWWMD monitored the water quality of Lake Wallenpaupack in 2008 and 2009. The lake was monitored at Stations 3 and 5 in 2008 and Stations 3, 4 and 5 in 2009 (Figure 2.1). These monitoring stations were monitored once a month in March, April, October and November and twice monthly during May through September.

In 2008 and 2009, *insitu* water temperature and dissolved oxygen data were collected at the designated lake stations on each study date. These *insitu* data (dissolved oxygen and water temperature) were collected at one-meter intervals from the surface to the bottom of the lake at each station using a YSI (Yellow Springs Instruments) Model 85 meter. In 2009, pH was measured in the field for surface waters using a Hanna HI 991300 (pH/EC/TDS/Temperature) meter. Secchi disk transparency (water clarity) was measured and recorded using a standard 8-inch (20 cm) freshwater Secchi disk at the lake stations on each study date.

**Lake Water Quality Monitoring Program for 2008-09**  
**Lake Wallenpaupack Watershed Management District**

---

In 2008, water samples were collected at two different depths on each study date at Stations 3 and 5. Surface samples were collected one meter (3.3 feet) below the lake's surface and bottom samples were collected one meter (3.3 feet) above the lake sediments. All water samples were collected using a Kemmerer water sampler unit. Once collected, all water samples were placed in bottles, preserved accordingly in the field, and then shipped to the certified contract laboratory for further analysis. The collected surface water samples were analyzed for pH, alkalinity, total phosphorus, soluble reactive phosphorus (namely orthophosphorus), nitrate, nitrite, total Kjeldahl nitrogen, total suspended solids and chlorophyll-a. The bottom water samples were analyzed for pH, total phosphorus, soluble reactive phosphorus, nitrate, nitrite, total Kjeldahl nitrogen and total suspended solids. In addition, composite samples of the photic zone were collected for phytoplankton and zooplankton analysis (identification and enumeration) at the stations on each study date. Discrete water samples were collected using the Kemmerer sampler and placed into a bucket to form composted samples for later phytoplankton identification and enumeration. The composite sample for zooplankton identification and enumeration was obtained by vertically towing the lake water column using a 80 um (micron) mesh plankton net. The photic zone was represented as twice the Secchi disk depth on each study date.



**Figure 2.1 Lake Monitoring Stations**

In 2009, water samples were once again collected at two different depths on each study date at Stations 3, 4 and 5. Surface samples were collected one meter (3.3 feet) below the lake's surface and bottom samples were collected 1 meter (3.3 feet) above the lake sediments. All water samples were collected using a Kemmerer water sampler. Once collected, all water samples were placed in bottles, preserved accordingly in the field, and then shipped to the certified contract laboratory for further analysis. In contrast to the previous year, the collected surface water samples were generally analyzed only for total phosphorus, soluble reactive phosphorus (namely orthophosphorus), total suspended solids and chlorophyll-a. The bottom water samples were only analyzed for total phosphorus, soluble reactive phosphorus, ammonia and total suspended solids. Similar to 2008, composite samples of the photic zone were collected for phytoplankton and zooplankton analysis at stations on each study date. Discrete water samples were collected using the Kemmerer sampler and placed into a bucket and composited together for later phytoplankton identification and enumeration. The composite samples for zooplankton identification and enumeration were obtained by vertically towing the lake water column using a 80 um (micron) mesh plankton net. All photic zone was represented as twice the Secchi disk depth on each study date.

All collected water samples were shipped directly to the contract laboratory, Quantum Laboratories in Dickson City, Pennsylvania, for analysis. In 2009, Quantum shipped all phytoplankton and zooplankton samples to Dr. Kenneth Wagner of Wilbraham, Massachusetts.

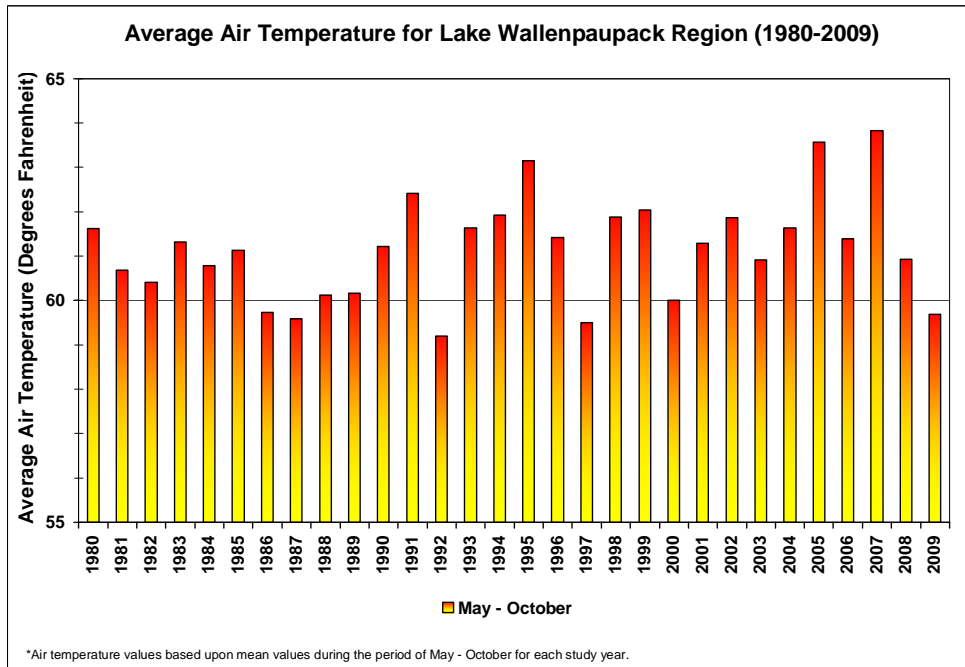
### **3. Local Climatological Data**

Aqua Link acquired and analyzed local climatological data, which are representative for Northeastern Pennsylvania (Figures 3.1 and 3.2). Overall, 2008 was quite normal with an average amount of precipitation and average air temperatures. In contrast, 2009 was a cooler and drier year when compared to data presented over the past 30 years.

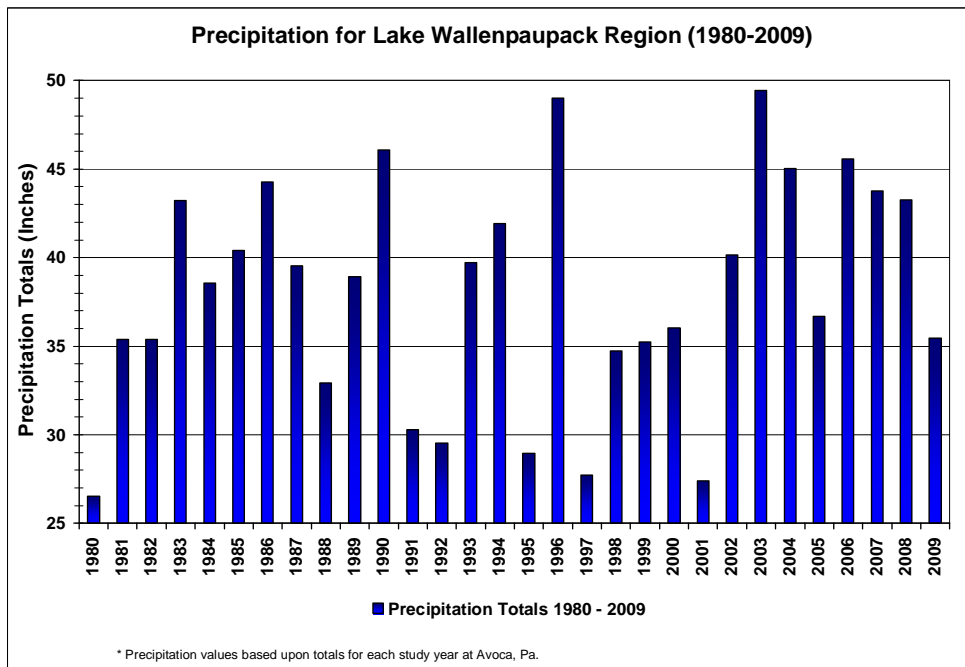
Figure 3.1 shows the average (mean) air temperatures for the growing season (May through October) from 1980 through 2009. Monthly temperature data were obtained via the Internet at the Pennsylvania State Climatologist website. Information at this website is provided by the College of Earth and Mineral Sciences at Penn State. Data were collected by averaging temperature data (in degrees Fahrenheit) for the months of May through October for each of the study years.

Figure 3.2 shows the total precipitation amounts from 1980 through 2009. Annual precipitation data was obtained via the Internet at the NOAA national weather service website. Precipitation measurements (recorded in inches) were report for Avoca, Pennsylvania from 1980 through 2009.

**Lake Water Quality Monitoring Program for 2008-09  
Lake Wallenpaupack Watershed Management District**



**Figure 3.1 Historical Air Temperature Data in the Lake Wallenpaupack Region**



**Figure 3.2 Historical Precipitation Data in the Lake Wallenpaupack Region**

## **4. Lake Water Quality Data Results for 2008-09**

The water quality data for Lake Wallenpaupack in 2008 and 2009 are presented in this section of the report. As discussed in Section 2, the lake was monitored at Stations 3 and 5 in 2008 and Stations 3, 4 and 5 in 2009 (Figure 2.1). Most of the section of the report focuses on the water quality data collected at Station 3, which is centrally located within the lake. This station has historically been used to describe the overall water quality of Lake Wallenpaupack and this appears to be quite logical based upon our review of data since 1980. In contrast, Station 5 is located uplake near the confluence of Wallenpaupack Creek and represents more eutrophic conditions – especially with respect to nutrients. Wallenpaupack Creek is the major tributary to the lake and drains a substantial portion of the massive Lake Wallenpaupack watershed (Figure 1.1).

With the exception of dissolved oxygen and water temperature, the water quality data at Station 3 are presented as average (mean) values for the growing season (May through October). The growing season is a very important time period since this is the time when the lakes are most heavily used (e.g. recreation, aesthetics) and most water quality problems, as related to eutrophication, occur. All of the lake data that were collected and analyzed in 2008 and 2009 are presented in Appendix C.

### **4.1. Temperature and Dissolved Oxygen**

In late spring or the beginning of summer, many moderately deep to deep temperate lakes develop stratified layers of water. Under stratified conditions, warmer and colder waters are near the lake's surface (epilimnion) and the lake's bottom (hypolimnion), respectively. As the temperature differences become greater between these two water layers, the resistance to mixing increases. During lake stratification, the epilimnion is usually oxygen-rich due to photosynthesis and direct inputs from the atmosphere, while the hypolimnion may become depleted of oxygen due to the respiration of aquatic organisms. As previously discussed, aquatic organisms (e.g., bacteria, fungi, protozoan, zooplankton, macroinvertebrates, fish) consume dissolved oxygen in order to metabolize prey or detritus (U.S. EPA 1980, U.S. EPA 1990 and U.S. EPA 1993).

Conversely, shallow temperate lakes may only become weakly stratified during the summer months or some lakes may never stratify at all. The overall degree and duration of stratification in weakly stratified lakes are largely dependent upon local wind conditions and the morphological characteristics of the lake itself. During windy days, surface wave action may be sufficient to partially or completely destratify (mix) a lake. Conversely, a shallow lake may become partially stratified on windless days.

Overall, water temperatures and dissolved oxygen concentrations are very important with regards to a lake's fishery. In general, the optimal water temperature for salmonid fish (i.e., trout) is 55 to 60 °F (12.8 to 15.6 °C). Trout may withstand water temperatures above 80 °F (26.7 °C) for several hours, but if water temperatures exceed 75 °F (23.9 °C) for extended periods, high trout mortality is expected (Pennsylvania State University). Conversely, non-salmonid fish such as golden shiners, bass, bluegills, can grow well even when water temperatures exceed 80 °F (26.7 °C). In general, safe minimum dissolved oxygen concentrations for adult salmonid and non-salmonid fish are 5.0 and 3.0 mg/L, respectively. When dissolved oxygen concentrations fall below these concentrations, production impairment of the lake's fishery can be expected.

In addition to impacting the lake's fishery, low dissolved oxygen levels in the bottom waters of a lake will often accelerate the release of nutrients such as soluble orthophosphorus (analytically measured as dissolved reactive phosphorus) and ammonia nitrogen, from anoxic (oxygen depleted) in-lake sediments. In particular, the accelerated release rates of nutrients (referred to as internal loading) can represent a substantial portion of all incoming nutrients to a lake. Increased nutrient loadings via in-lake sediments may further degrade lake water quality by increasing the production of both phytoplankton and aquatic macrophytes (vascular plants).

#### Lake Wallenpaupack

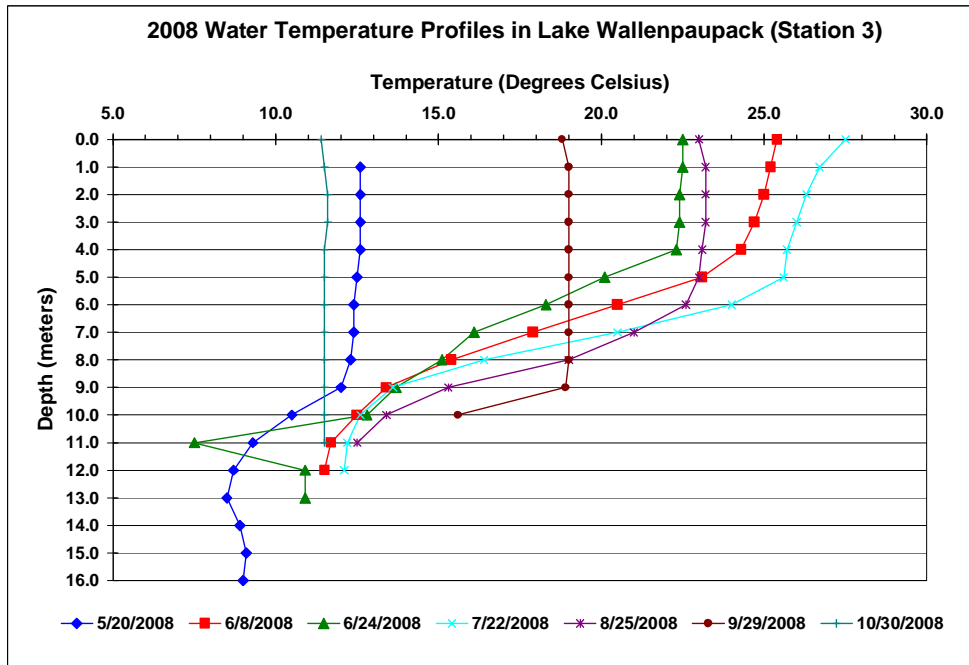
The 2008 and 2009 water temperature and dissolved oxygen profile data for Lake Wallenpaupack are graphically presented in Figures 4.1 through 4.4. The maximum water depth at Station 3 was 16 meters (52.5 feet) in 2008 and 13 meters (42.6 feet) in 2009.

Thermal stratification is observed during the summer months as indicated in both Figures 4.1 and 4.2. Figures 4.3 and 4.4 indicate a decrease in dissolved oxygen levels in 2008 and 2009, most notably starting at a depth of approximately 4 to 7 meters (13.1 to 23.0 feet) for the majority of the study dates.

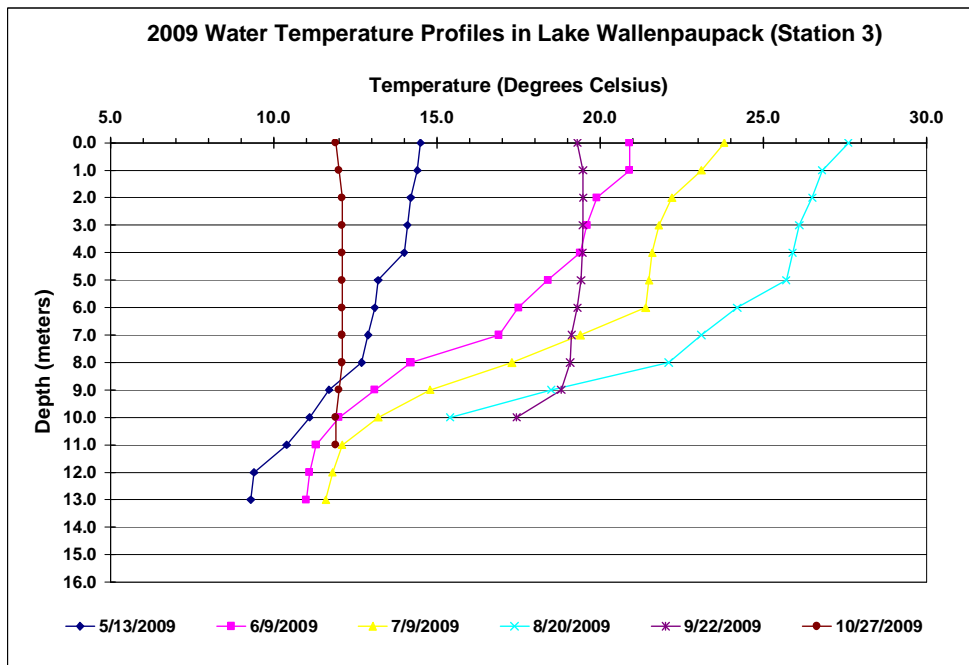
## **4.2. pH & Alkalinity**

The pH and alkalinity of water are directly related to one another. In general, as alkalinity increases, the pH of the water also increases. The acidity or basicity of a solution is most often expressed as pH. The term pH is defined as the logarithm of the reciprocal (or its negative logarithm) of the hydrogen ion concentration. Therefore, a one unit change in pH represents a ten-fold increase or decrease in the hydrogen ion concentration (as pH decreases, the hydrogen ion concentration increases). The pH scale ranges from 0 to 14 standard units where a value of 7 indicates neutral conditions. Water becomes more acidic when pH values fall below 7 and more basic when pH values rise above 7. In general, most natural waters usually have a pH values between 6.5 and 8.5.

**Lake Water Quality Monitoring Program for 2008-09  
Lake Wallenpaupack Watershed Management District**

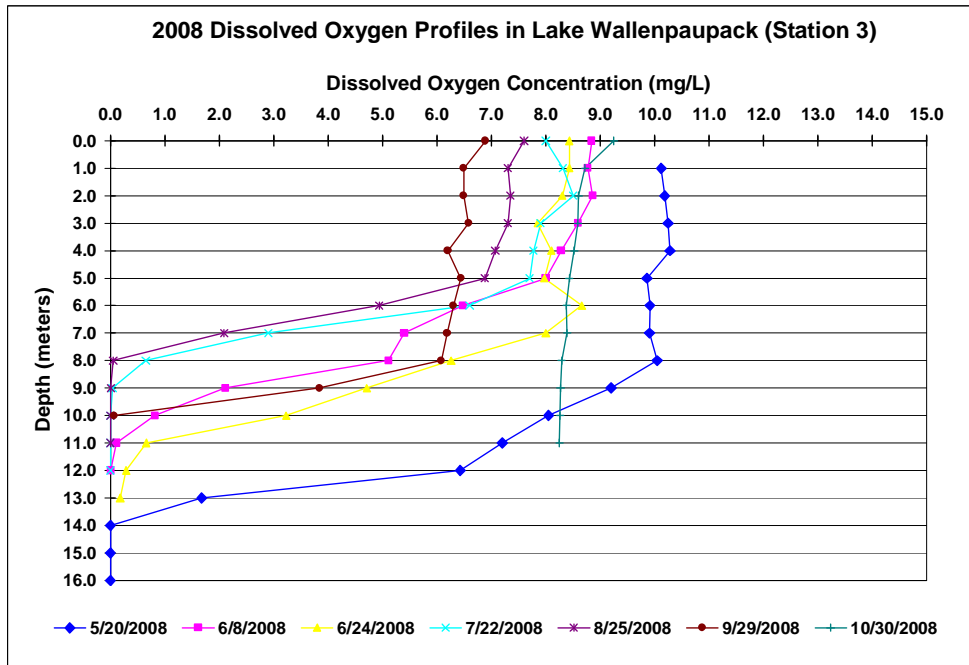


**Figure 4.1 Water Temperature Profiles at Station 3 in 2008**

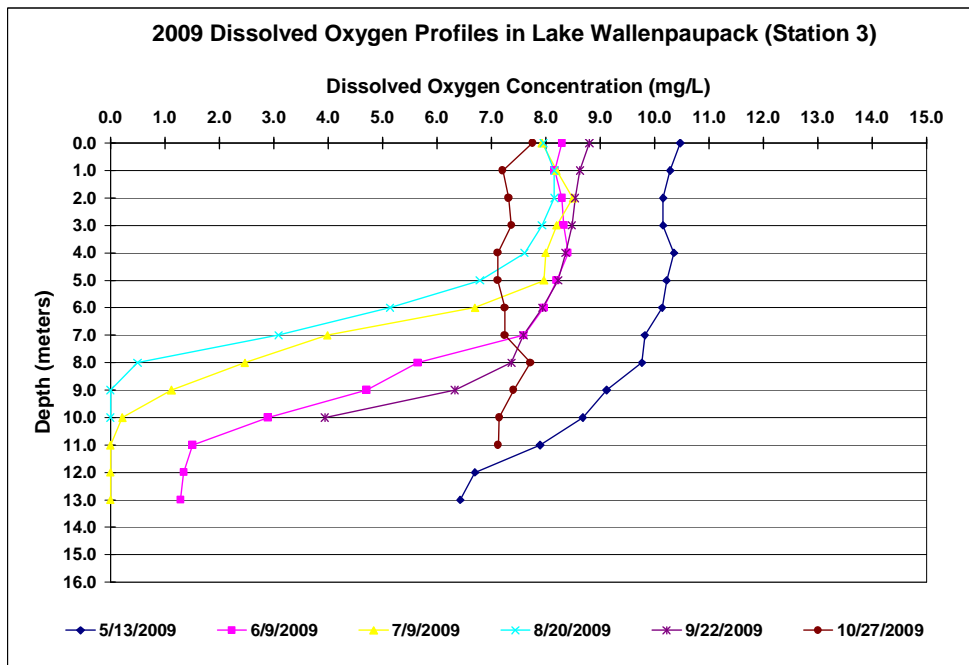


**Figure 4.2 Water Temperature Profiles at Station 3 in 2009**

**Lake Water Quality Monitoring Program for 2008-09  
Lake Wallenpaupack Watershed Management District**



**Figure 4.3 Dissolved Oxygen Profiles at Station 3 in 2008**



**Figure 4.4 Dissolved Oxygen Profiles at Station 3 in 2009**



Aquatic life in lakes can be adversely impacted when pH levels drop too low in lakes. When pH concentrations fall below 6.0 standard units, there is a greater risk to increase the concentration of heavy metals, in particular aluminum. High concentrations of hydrogen and aluminum ions are known to adversely affect the ion regulation of aquatic organisms, a condition referred to as "osmoregulatory failure". When osmoregulatory failure occurs, high hydrogen and aluminum concentrations induce the leaching of sodium and chloride ions from the body fluids of fish and other aquatic organisms (U.S. EPA, 1990). As summarized by J. Baker, pH values ranging from 5.5 to 6.0 standard units can result in the loss of sensitive minnows and dace, which may be important as forage fish for game fish. In addition, the pH levels below 6.0 are also known to adversely affect the reproductive success rates of game fish, such as walleye (U.S. EPA, 1990).

Alkalinity refers to the capacity of water to neutralize (or buffer against) acid inputs. Alkalinity of natural waters is due primarily to the presence of hydroxides ( $\text{OH}^-$ ), bicarbonates ( $\text{HCO}_3^-$ ), carbonates ( $\text{CO}_3^{2-}$ ) and occasionally borates, silicates and phosphates. Therefore, the carbonate–bicarbonate equilibrium system ( $\text{CO}_2 - \text{HCO}_3^- - \text{CO}_3^{2-}$ ) is the major buffering mechanism in freshwater lakes (Wetzel 1983).

Alkalinity is typically expressed in units of milligrams per liter (mg/l) of  $\text{CaCO}_3$  (calcium carbonate). Waters having a pH below 4.5 contain no alkalinity. Low alkalinity is the main indicator of susceptibility of aquatic organisms to acidic inputs (e.g., acid rain and acidic dry fallout). Waters with pH values ranging from 6 to 9 are largely comprised of bicarbonate ( $\text{HCO}_3^-$ ). At higher pH values, carbonate ( $\text{CO}_3^{2-}$ ) plays a more important role in the buffering capacity of the water. Lakes with watersheds that contain sedimentary carbonate rocks are high in dissolved carbonates (hard-water lakes). Conversely, lakes in granite or igneous rocks are low in dissolved carbonates (soft water lakes). In the Northeastern U.S., the alkalinity of natural surface waters typically ranges from 5 to over 200 mg/L as  $\text{CaCO}_3$ .

#### Lake Wallenpaupack

The 2008 mean pH values for surface and bottom waters are presented in Table 4.1. Overall, the surface and bottom waters are considered to be relatively neutral. The slightly higher mean values for the surface waters were due to increased levels of photosynthesis by phytoplankton in the epilimnion (surface waters).

The mean alkalinity concentration for surface water in 2008 is shown in Table 4.1. The value is somewhat low, but still within the range for lakes within Northeastern U.S. Overall, the mean alkalinity concentration should be sufficiently high enough to regulate or maintain stable pH levels in the lake. This simply means that the lake is not highly susceptible to acidic inputs such as, acid rain, acidic runoff from snowmelt and acidic dry deposition. Conversely, when acidic inputs are episodically high, the pH levels in the lake may decline, thereby providing additional stress on acid

intolerant aquatic organisms. Unfortunately, collected lake water samples were not analyzed for alkalinity in 2009.

**Table 4.1 Mean pH & Alkalinity Concentrations at Station 3 in 2008-09**

Year	pH (standard units, s.u.)		Alkalinity (mg/l as CaCO <sub>3</sub> )	
	Surface	Bottom	Surface	Bottom
2008	7.26	6.88	15.7	N/A
2009	N/A	N/A	N/A	N/A

### 4.3. Phosphorus

Total phosphorus represents the sum of all forms of phosphorus. Total phosphorus includes dissolved and particulate organic phosphates (e.g., algae and other aquatic organisms), inorganic particulate phosphorus as soil particles and other solids, polyphosphates from detergents and dissolved orthophosphates. Soluble (or dissolved) orthophosphate (determined analytically as dissolved reactive phosphorus) is the phosphorus form that is most readily available for algal uptake. Soluble orthophosphate is usually reported as dissolved reactive phosphorus because laboratory analysis takes place under acid conditions and may result in the hydrolysis of some other phosphorus forms. Total phosphorus levels are strongly affected by the daily phosphorus loadings to a lake, while soluble orthophosphate levels are largely affected by algal consumption during the growing season.

Based on criteria established by Nurnberg (2001), a lake is classified as oligotrophic, mesotrophic, eutrophic and hypereutrophic when surface total phosphorus concentrations are less than 0.010 mg/l as P, 0.010 to 0.030 mg/l as P, 0.031 to 0.100 mg/l as P and greater than 0.100 mg/l as P, respectively.

Lake Wallenpaupack

The 2008 mean total phosphorus concentrations for surface and bottom waters were 0.024 and 0.065 mg/L as P, respectively. Similarly, the 2009 mean total phosphorous concentrations in the surface and bottom waters were 0.033 and 0.067 mg/L as P, respectively (Table 4.2). The higher concentrations in the bottom waters are likely due to the settling of dead algae and the release of phosphorus from anoxic sediments (sediments containing no dissolved oxygen). Based upon the above criteria, the mean total phosphorus concentrations for surface waters suggest that Lake Wallenpaupack is classified as slightly eutrophic in both 2008 and 2009. It should be noted, however, that the data used to acquire the mean total phosphorous concentrations may be skewed to appear higher than the actual value due to an inconsistent and occasionally high MDL (method detection limit) for phosphorous for conducting lake monitoring.

The 2008 mean dissolved reactive phosphorus concentrations for surface and bottom waters were both 0.010 and 0.032 mg/L as P, respectively. Likewise, the values for 2009 were 0.014 and 0.028 mg/L as P, respectively (Table 4.4). Extremely low dissolved reactive phosphorus concentrations (at or below the detection limit) indicate that this form of phosphorus is rapidly used by phytoplankton as soon as it becomes available. Once again, even though the values for this parameter are relatively low, it should be noted that the data used to acquire the mean dissolved reactive phosphorous concentrations may be somewhat skewed to appear higher than the actual value. This is also due to an inconsistent and sometimes higher than desired MDL for phosphorous.

**Table 4.2 Mean Phosphorus Concentrations at Station 3 in 2008-09**

<i>Year</i>	<i>Total Phosphorus (mg/L as P)</i>		<i>Dissolved Reactive Phosphorus (mg/L as P)</i>	
	<i>Surface</i>	<i>Bottom</i>	<i>Surface</i>	<i>Bottom</i>
2008	0.024	0.065	0.010	0.032
2009	0.033	0.067	0.014	0.028

## **4.4. Nitrogen**

Nitrogen compounds are also important for the growth and reproduction of phytoplankton and aquatic macrophytes. The common inorganic forms of nitrogen in water are nitrate ( $\text{NO}_3^-$ ), nitrite ( $\text{NO}_2^-$ ) and ammonia ( $\text{NH}_3$ ). In water, ammonia is present primarily as ammonium ( $\text{NH}_4^+$ ) and undissociated ammonium hydroxide ( $\text{NH}_4\text{OH}$ ). Of these two forms, undissociated ammonium hydroxide is toxic and its toxicity increases as pH and water temperature increase. Overall, the most dominant form of inorganic nitrogen present in lakes depends largely on the dissolved oxygen concentrations. Nitrate is the form usually found in surface waters, while ammonia is only stable under anaerobic (low oxygen) conditions. Nitrite is an intermediate form of nitrogen, which is generally considered unstable. Nitrate and nitrite (referred to as total oxidized nitrogen) are often analyzed together and reported as  $\text{NO}_3 + \text{NO}_2\text{-N}$ , although nitrite concentrations are usually insignificant as noted previously. Total Kjeldahl nitrogen (TKN) concentrations include ammonia and organic nitrogen (both soluble and particulate forms). Organic nitrogen can be easily estimated by subtracting ammonia nitrogen from total Kjeldahl nitrogen concentrations. Total nitrogen is calculated by summing the nitrate-nitrite, ammonia and organic nitrogen fractions together.

According to Nurnberg (2001), lakes with surface total nitrogen concentrations less than 0.350 mg/l as N are classified as oligotrophic, from 0.350 to 0.650 mg/l as N are classified as mesotrophic, from 0.651 to 1.200 mg/L are classified as eutrophic and greater than 1.200 mg/l as N are classified as hypereutrophic.

### Lake Wallenpaupack

The 2008 and 2009 mean total nitrogen, total Kjeldahl nitrogen (TKN), nitrate plus nitrite nitrogen, and ammonia nitrogen concentrations for surface and bottom waters are presented in Table 4.5. Overall, the 2008 mean total nitrogen concentration for the bottom waters was slightly higher than the mean concentration for the surface waters. This slightly higher value in the bottom waters is most likely attributed to higher levels of ammonia nitrogen and nitrate plus nitrite nitrogen. Higher ammonia concentrations in the bottom waters are due to low dissolved oxygen concentrations plus the accelerated release rates by anoxic sediments (sediments containing no dissolved oxygen).

Based upon the Nurnberg criteria (2001), the mean total nitrogen concentrations for surface waters are moderately high and thereby suggesting that Lake Wallenpaupack was classified as eutrophic in 2008. Unfortunately, the necessary laboratory data used to calculate mean total nitrogen concentrations for both surface and bottom waters were not attained at the time of sampling. As a result, a comparison of total nitrogen concentrations during both 2008 and 2009 cannot be made.

**Table 4.3 Mean Nitrogen Concentrations at Station 3 in 2008-09**

Year	Total Nitrogen (mg/L as N)		Total Kjeldahl Nitrogen (mg/L as N)		Nitrate + Nitrite (mg/L as N)		Ammonia (mg/L as N)	
	Surface	Bottom	Surface	Bottom	Surface	Bottom	Surface	Bottom
2008	1.041	1.099	1.000	1.013	0.041	0.086	N/A	N/A
2009	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.516

#### 4.5. Secchi Disk Transparency & Chlorophyll-a

The transparency, or clarity, of a lake is most often reported as the Secchi disk depth. This measurement is taken by lowering a circular black-and-white disk, which is 20 cm (8 inches) in diameter, into the water until it is no longer visible. Observed Secchi disk depths range from a few centimeters in very turbid lakes to over 40 meters in the clearest known lakes (Wetzel, 1983). Although somewhat simplistic and subjective, this field monitoring method probably best represents those lake conditions that are most often perceived by lake users and the general public.

Secchi disk transparency is related to the transmission of light in water, and depends on both the absorption and scattering of light. The absorption of light in dark-colored waters reduces light transmission. Light scattering is usually a more important factor than absorption in determining Secchi depths. Scattering can be caused by water discoloration or by the presence of both particulate organic matter (e.g., algal cells) and inorganic materials (e.g., suspended clay particles).

In general, a lake is classified as oligotrophic, mesotrophic, eutrophic and hypereutrophic when Secchi disk transparency values are greater than 4.0 meters, 4.0 to 2.0 meters, 1.9 to 1.0 meters and less than 1.0 meter, respectively (Nurnberg 2001).

Chlorophyll-a is a pigment that gives all plants their green color. The function of chlorophyll-a is to convert sunlight to chemical energy in the process known as photosynthesis. Because chlorophyll-a constitutes about 1 to 2 percent of the dry weight of planktonic algae, the amount of chlorophyll-a in a water sample is an indicator of phytoplankton biomass. According to Nurnberg (2001), a lake is generally classified oligotrophic, mesotrophic, eutrophic and hypereutrophic when chlorophyll-a concentrations are less than 3.5 ug/l, 3.5 to 9.0 ug/l, 9.1 to 25.0 ug/l and greater than 25.0 ug/l (micrograms per liter), respectively.

Lake Wallenpaupack

The 2008 and 2009 mean Secchi disk transparency values for Lake Wallenpaupack were both 2.2 meters. Based upon Nurnberg (2001), the lake is classified as highly mesotrophic. Secchi disk transparency values ranged from 1.3 to 3.0 meters for all study dates. It should be noted that the lowest transparency value occurred when the highest phytoplankton biomass level was recorded in the lake in August 2008 (Figure 4.5).

The 2008 and 2009 mean chlorophyll-a concentrations in Lake Wallenpaupack were 11.9 and 9.6 ug/L, respectively. Chlorophyll-a concentrations ranged from 2.0 to 23.9 ug/L during the study period. According to the Nurnberg criteria, the mean chlorophyll-a concentration indicates slightly eutrophic conditions.

**Table 4.4 Mean Secchi & Chlorophyll-a Values at Station 3 in 2008-09**

<i>Year</i>	<i>Secchi Disk Transparency (m)</i>	<i>Chlorophyll-a (ug/l)</i>
2008	2.2	11.9
2009	2.2	9.6

#### **4.6. Total Suspended Solids**

The concentration of total suspended solids in a lake is a measure of the amount of particulate matter in the water column. Suspended solids include both organic matter including phytoplankton and inorganic materials like soil particles.

Lake Wallenpaupack

The 2008 and 2009 mean total suspended solids concentrations in the lake are presented in Table 4.5. The concentrations for surface and bottom waters are considered low to moderately low. These concentrations are typical for lake systems containing moderate levels of aquatic productivity in the form of phytoplankton and/or moderate sediment loadings from the surrounding watershed.

**Table 4.5 Mean Total Suspended Solids Concentrations at Station 3 in 2008-09**

<i>Year</i>	<i>Total Suspended Solids (mg/l)</i>	
	<i>Surface</i>	<i>Bottom</i>
2008	2.0	2.5
2009	2.2	3.7

#### **4.7. Phytoplankton & Zooplankton Biomass**

The quantity of phytoplankton (free floating, microscopic aquatic plants commonly referred to as algae) and macrophytes (vascular aquatic plants) are primary biological indicators of lake trophic conditions. Small aquatic animals, namely zooplankton and macroinvertebrates, graze upon algae and fragments of aquatic plants. Larger invertebrates and fish then consume the above grazers and to a lesser extent, some aquatic plants.

Information about the plankton community composition and succession is extremely useful when attempting to gain a better understanding about various lake problems. For example, eutrophic lakes often support unbalanced phytoplankton communities characterized by very large numbers of relatively few species. The number of larger zooplankton will tend to decrease during periods when blue-green algae are dominant. Conversely, oligotrophic lakes and acidic lakes often have smaller populations of both phytoplankton and zooplankton. Acidic lakes typically will also have lower species diversity.

### **4.7.1. Phytoplankton**

Phytoplankton are free floating, microscopic aquatic plants that have little or no resistance to currents and live suspended in open water. Their forms may be unicellular, colonial or filamentous. As photosynthetic organisms (primary producers), phytoplankton form the base of aquatic food chain and are grazed upon by zooplankton and herbivorous fish.

A healthy lake should support a diverse assemblage of phytoplankton, in which many algal species are represented. Excessive growth of a few species is usually undesirable. Such growth can result in dissolved oxygen depletion during the night, when the algae are respiring rather than photosynthesizing. Dissolved oxygen depletion also can occur shortly after a massive “algal bloom” due to increased levels of respiration by bacteria and other microorganisms that are metabolizing dead algal cells. Excessive growth of some species of algae, particularly members of the blue-green group, may cause taste and odor problems, release toxic substances to the water, or give the water an unattractive green soupy or scummy appearance.

Planktonic productivity is commonly expressed in terms of density and biomass. Phytoplankton densities are most frequently expressed as cells per milliliter (cells/ml). Biomass is commonly expressed on a mass per volume basis as micrograms per liter ( $\mu\text{g/l}$ ). Of the two, biomass provides a better estimate of the actual standing crop of phytoplankton in lake systems.

#### Lake Wallenpaupack

The phytoplankton community in 2008 and 2009 was represented by genera from seven different taxa: Bacillariophyta (diatoms), Chlorophyta (green algae), Chrysophyta (golden-brown algae), Cryptophyta (cryptomonads), Cyanophyta (blue-green algae), Euglenophyta (euglenoids), and Pyrrophyta (fire algae). The phytoplankton biomasses in Lake Wallenpaupack ranged from 1,900 to 53,086  $\mu\text{g/L}$  (micrograms per liter) for 2008 and 2,394 to 20,268  $\mu\text{g/L}$  (micrograms per liter) for 2009, as shown in Figure 4.5 and 4.6. The highest phytoplankton biomass value was reported in August of 2008. In general, phytoplankton biomass below 2,500  $\mu\text{g/l}$  are considered low, ranging from 2,500 to 7,500  $\mu\text{g/l}$  are moderately low to moderately high, ranging from 7,500 to 10,000  $\mu\text{g/l}$  are high and above 10,000 are considered very high. Biomasses often exceeding 5,000  $\mu\text{g/l}$  are perceived by many as “algal bloom” conditions.

Phytoplankton biomass peaked in August 2008 and was largely dominated by *Anabaena* (Cyanophyte) as shown in Figure 4.5. With the exception of August 2008, biomass values were notably less during May through October of both 2008 and 2009, ranging from a minimum of 1,900 to a maximum value of 30,441  $\mu\text{g/L}$ . These values are illustrated in Figures 4.5 and 4.6. Overall, the phytoplankton assemblages, with the exception of the relatively high *Anabaena* biomass during July



and most notably August 2008, were considered moderately well distributed among other various taxa during May through October of both 2008 and 2009.

Overall, the 2008 study year contained substantially higher amounts of phytoplankton when compared to the 2009 study year. There are plausible reasons for these differences. First, 2009 was a much cooler and drier year (Section 3). Secondly, different aquatic biologists were retained for phytoplankton analysis (identification, enumeration and analysis). This second point may be more important since Secchi disk transparency and chlorophyll-a concentrations (Table 4.4) were similar while phytoplankton biomasses (Figures 4.5 and 4.6) were very different in 2008 and 2009.

### **4.7.2. Zooplankton**

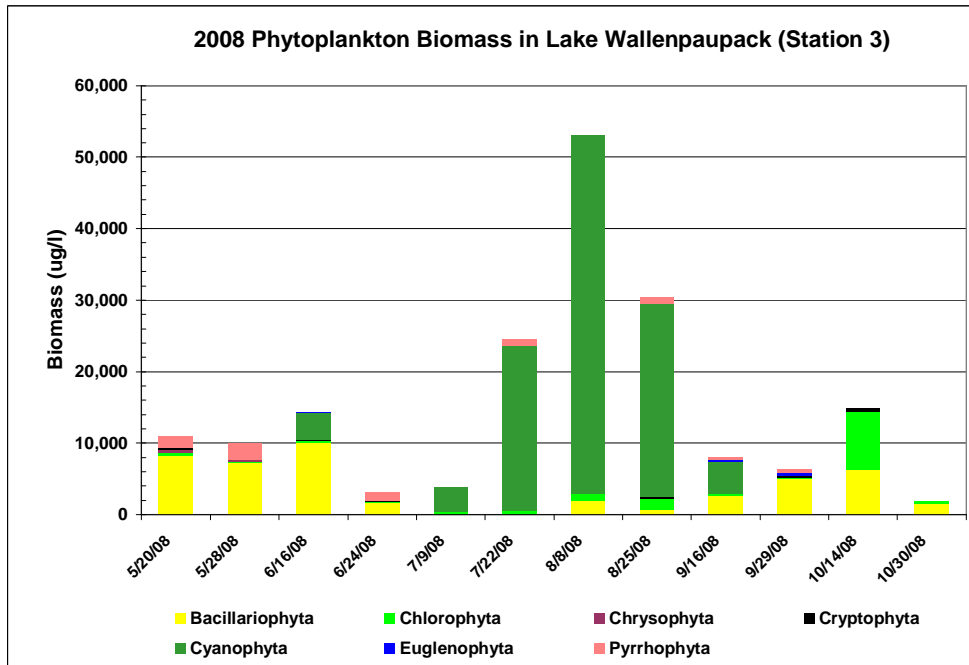
Zooplankton are suspended microscopic animals whose movements in a lake are primarily dependent upon water currents. The zooplankton of freshwater ecosystems are dominated primarily by four major groups: the protozoa, the rotifers and two subclasses of crustacea, the cladocerans (i.e., water fleas) and the copepods. Zooplankton are generally smaller than 2 millimeters (one-tenth of an inch) in size and primarily feed on algae, other zooplankton, and plant and animal particles. Zooplankton grazing can have a significant impact on phytoplankton species composition and productivity (i.e. biomass) through selective grazing (e.g., size of zooplankton influences what size phytoplankton are consumed) and nutrient recycling. Zooplankton are then consumed by fish, waterfowl, aquatic insects, and others, thereby playing a vital role in the transfer of energy from phytoplankton to higher trophic levels.

#### Lake Wallenpaupack

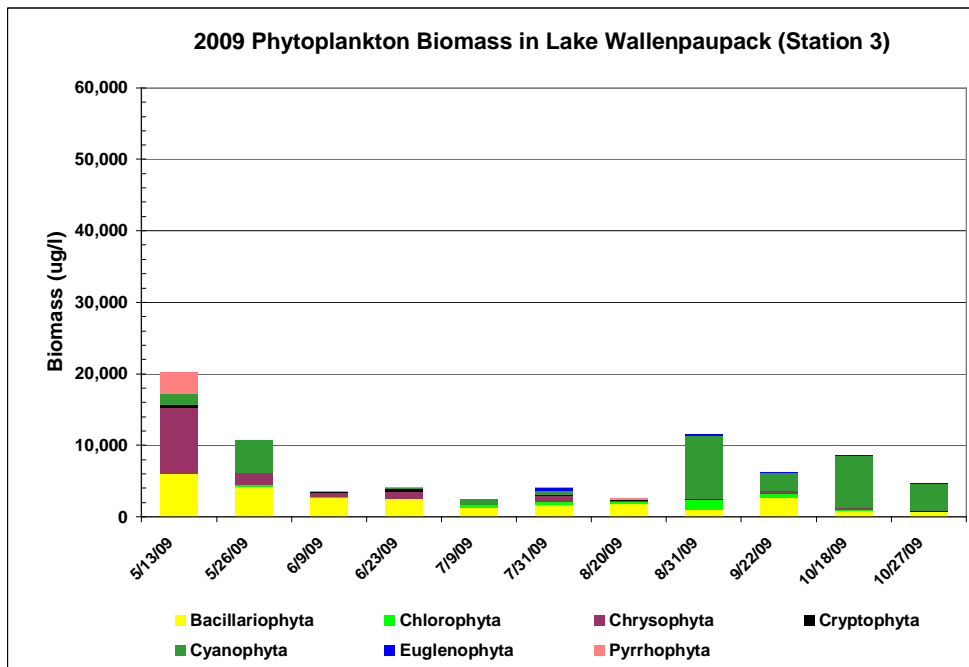
Zooplankton communities in 2008 and 2009 were represented by genera from four different taxa: Protozoa (single-celled animals), Rotifera (rotifers), Copapoda (crustacean), and Cladoceran (crustacean). Zooplankton biomass values were significantly higher during the May through October growing season of 2008 as compared to 2009 (Figures 4.7 and 4.8). This is likely due to higher phytoplankton biomass during the mid-summer of 2008 and the direct relationship of phytoplankton and zooplankton populations in the aquatic food chain as illustrated in Appendix B. Shortly after phytoplankton biomass increases, zooplankton biomass will often increase as well in a natural and undisturbed ecosystem.

The data suggests rotifers dominated the zooplankton community throughout the growing season of 2008 while cladocerans, although significantly lower in biomass when compared to the rotifers of 2008, were most dominant during 2009. A moderate copepod increase was also observed during October 2009. Similarly to the phytoplankton populations, the overall zooplankton assemblages were considered fairly well distributed among the aforementioned taxa during the growing seasons of 2008 and 2009.

**Lake Water Quality Monitoring Program for 2008-09  
Lake Wallenpaupack Watershed Management District**

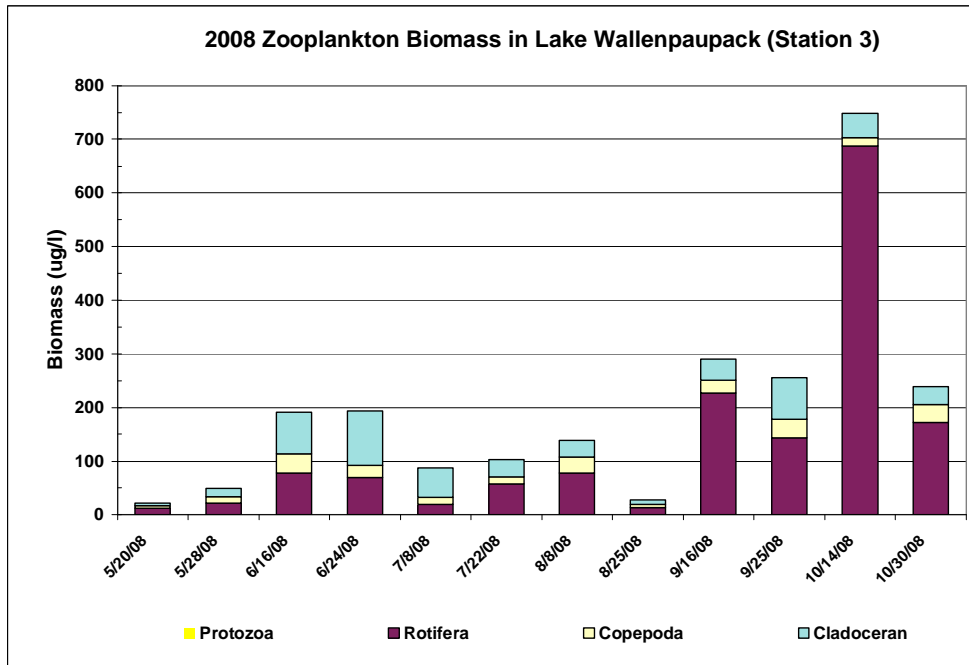


**Figure 4.5 Phytoplankton Biomass at Station 3 in 2008**

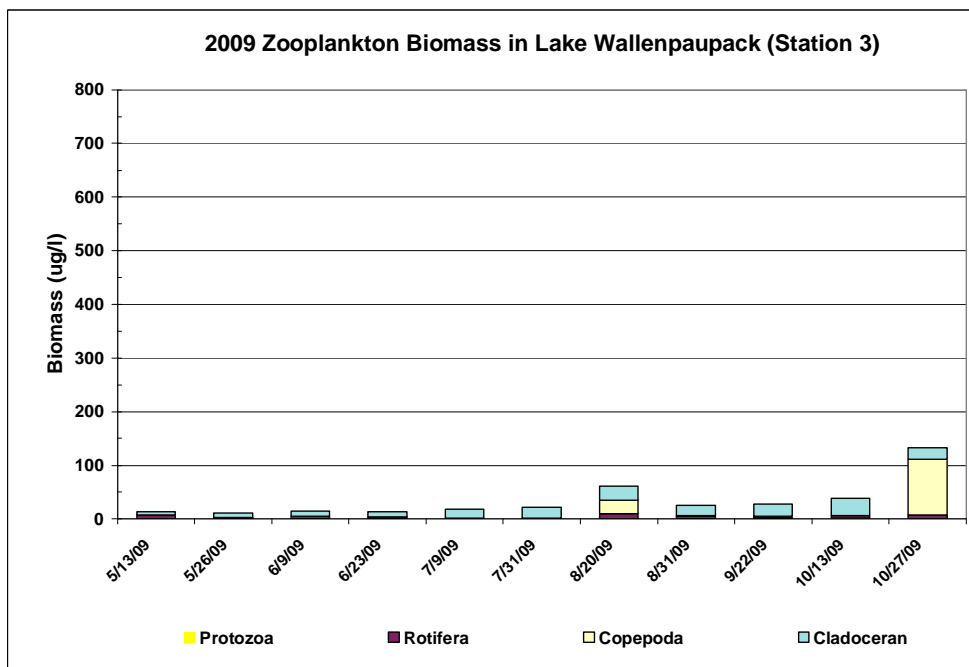


**Figure 4.6 Phytoplankton Biomass at Station 3 in 2009**

**Lake Water Quality Monitoring Program for 2008-09  
Lake Wallenpaupack Watershed Management District**



**Figure 4.7 Zooplankton Biomass at Station 3 in 2008**



**Figure 4.8 Zooplankton Biomass at Station 3 in 2009**

Similar to Section 4.7.1, different aquatic biologists were retained for zooplankton analysis (identification, enumeration and analysis. Therefore, laboratory methodology differences (e.g. subsampling and counting methods) may have accounted for some variation when comparing the 2008 and 2009 data.

#### **4.8. Carlson's Trophic State Index Values**

The Trophic State Index (TSI) developed by Carlson (1977) is among the most commonly used indicators of lake trophic state. This index is actually composed of three separate indices based on measurements of total phosphorus concentrations, chlorophyll-a concentrations and Secchi disk depths for many lakes. Total phosphorus was chosen for the index because phosphorus is often the nutrient limiting for phytoplanktonic growth in lakes. Chlorophyll-a is a plant pigment present in all algae and is used to provide an indication of the biomass of phytoplankton and Secchi disk depth is a common measure of lake transparency.

As part of this study, TSI values were determined for total phosphorus, chlorophyll-a, and Secchi depth data for each of the study dates. Total phosphorus concentrations, chlorophyll-a concentrations, and Secchi disk depths were logarithmically converted to a trophic state scale ranging from 1 to 100. Increasing values for the Trophic State Index are indicative of increasing lake trophic states. In general, index values less 35 to 40 are indicative of oligotrophic conditions, while index values greater than 50 to 55 are indicative of eutrophic lake conditions. The Pennsylvania Department of Environmental Protection (PA DEP) classifies lakes according to the following: oligotrophic (less than 40), mesotrophic (40 to 50), eutrophic (50 to 65) and hyper-eutrophic (greater than 65) as noted in its 2002 PA Water Quality Assessment 305(b) Report.

##### Lake Wallenpaupack

The calculated 2008 and 2009 mean Carlson TSI values for Secchi depth, chlorophyll-a and total phosphorus are presented in Table 4.6. The TSI values for chlorophyll-a and total phosphorus suggest that Lake Wallenpaupack is classified as slightly eutrophic, while the TSI value for Secchi transparency indicates highly mesotrophic conditions.

Overall, the TSI values for Secchi depth transparency and chlorophyll-a were similar to the TSI value for total phosphorus. This often occurs in lakes that are phosphorus limiting. When divergence occurs between the TSI values, more emphasis is placed upon the TSI value for chlorophyll-a during the summer months.

**Table 4.6 Mean Carlson's TSI Values at Station 3 in 2008-09**

Year	Trophic State Index (TSI) Values		
	Secchi Depth	Chl-a	Total P
2008	48.8	54.9	49.8
2009	48.7	52.7	54.5

Note: Mean TSI values determined by averaging the individual TSI values for each parameter during the 2008 and 2009 study period.

#### **4.9. Summary of Lake Assessment Data**

Lake Wallenpaupack was classified as a slightly eutrophic reservoir in 2008 and 2009. The mean Carlson TSI values for total phosphorus, chlorophyll-a, and Secchi disk transparency were 49, 55, and 50, respectively, for 2008. The 2009 values were 49, 53, and 55, respectively.

The lake thermally stratified in 2008 and 2009 and therefore is considered a moderately deep, dimictic reservoir (lake). Dimictic lakes are those lakes that thermally stratify during most of the growing season (May through October). In this study, Lake Wallenpaupack was thermally stratified from May through September. In turn, the dissolved oxygen concentrations were strongly stratified when the lake was thermally stratified. In general, dissolved oxygen levels typically fell below 1 mg/L in the deeper lake waters portion (ranging from 8 to 14 meters or 26 to 46 ft).

Phytoplankton data indicate that blue-green algae (Cyanophyta) are dominant during the growing season. The most common genus was *Anabaena*. Further observation concluded that zooplankton biomass also increased shortly after the phytoplankton biomass increased. Zooplankton biomass often increased following a sharp increase in phytoplankton biomass. This is a typical response where zooplankton numbers increase to graze down the higher amounts of phytoplankton biomass, thereby resulting in naturally balancing out the aquatic ecosystem.

## **5. Historical Lake Water Quality Trends**

Aqua Link evaluated historical water quality data collected in Lake Wallenpaupack from 1980 through 2009. Key water quality parameters that are discussed in Sections 5.1 through 5.6 are total phosphorus, total nitrogen, Secchi disk transparency, chlorophyll-a, plankton biomass (phytoplankton and zooplankton), and Carlson Trophic State Index (TSI) values. Total phosphorus and total nitrogen data are presented for surface (epilimnion) and bottom (hypolimnion) waters.

The comparison of recently acquired data to past data is commonly referred to as “water quality trend analysis”. Professional lake and water resource managers commonly evaluate complex historical water quality data using trend analysis. Overall, water quality trend analysis is a very powerful tool in assessing whether lake water quality has improved, degraded or remained unchanged over time.

Lake water quality trends for the key water quality parameters are presented below graphically for Station 3. Station 3, which is centrally located within the lake, has historically been used to describe the overall water quality of Lake Wallenpaupack (Section 4). The graphs contain annual mean (average) concentrations and values for the key water quality parameters for the growing season (May through October). As observed in Figures 5.1 through 5.9, lake water quality often varies seasonally and annually and these variations can be affected by numerous factors including local climatological conditions. To assess any water quality trends, “best fit” lines were determined statistically using linear regression and these lines were plotted on Figures 5.1 through 5.9. The slopes of these regression lines were used to assess the overall degree of water quality improvement or degradation in the lake.

### **5.1. Phosphorus**

The mean total phosphorus concentrations from 1980 through 2009 for surface and bottom waters are shown in Figures 5.1 and 5.2, respectively. Figures 5.1 and 5.2 indicate that total phosphorus concentrations have gradually decreased (improved) since 1980. The total phosphorus increase in 2009 may be attributed to premature lake mixing in August and September.

Premature lake mixing is likely due to local climatological conditions along with hypolimnetic lake water withdrawals. As noted in Section 3, the 2009 study year was relatively cooler and drier as shown in Figures 3.1 and 3.2. Cooler air temperatures correspond to weaker thermal stratification between the surface and bottom waters. Below normal precipitation and continued hypolimnetic withdrawals by PP&L for hydroelectric power generation resulted in a water level decrease of approximately 3 meters (9.8 feet) from July to August. The above conditions allowed nutrient enriched bottom (hypolimnetic) waters to more easily mix the surface (epilimnetic) waters, thereby raising the phosphorus concentrations in the surface waters.

## **5.2. Nitrogen**

The mean total nitrogen concentrations from 1980 through 2008 for surface and bottom waters are shown in Figures 5.3 and 5.4, respectively. Figures 5.3 and 5.4 indicate that total nitrogen concentrations in the lake have gradually increased since 1980. It should be noted that total nitrogen was not monitored in 2009.

The sharp increase in total nitrogen concentrations in surface and bottom waters in 2008 is artificially high. This is because the laboratory method detection limit (MDL) for this parameter was set too high for lake assessments. In our opinion, the 2009 total nitrogen data should be flagged and discarded from the historical water quality data set because it is highly misleading.

## **5.3. Secchi Transparency**

The mean Secchi disk transparency from 1980 through 2009 is shown in Figure 5.5. Figure 5.5 indicates that lake transparency has steadily improved since 1980. One plausible explanation for this trend is that the phytoplankton community has become more diversified and less dominated by nuisance blue-green algae (Cyanophytes) as discussed in Section 5.5 and shown in Figure 5.7. Blue-green algae commonly are associated with many lake problems including their adverse impacts on lake transparency (water clarity).

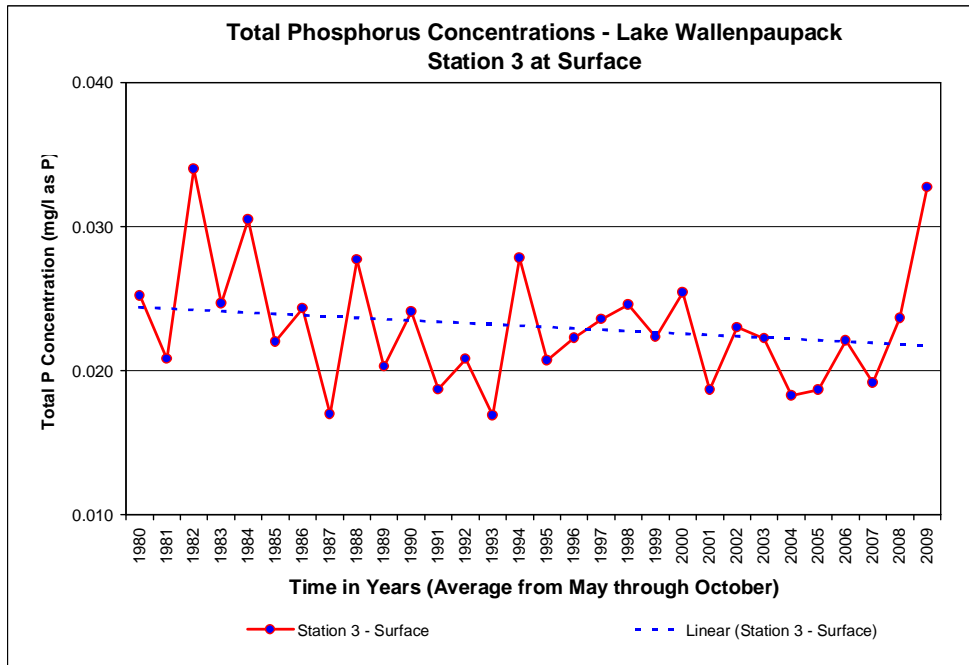
Changes in the phytoplankton community may be related to decreases in total phosphorus (Figures 5.1 and 5.2) and increases in total nitrogen (Figures 5.3 and 5.4). In general, higher nitrogen to phosphorus concentration ratios in lakes often favor green (Chlorophyta) over blue-green algae.

Overall, blue-green algae often become dominant in the summer months due to their preference of warmer lake waters in nutrient enriched lakes. Blue-green algae also have other competitive advantages including their ability to fix atmospheric nitrogen if needed, regulate their buoyancy to stay near the lake surface, and avoid predation by grazers (zooplankton). Blue-green algae are known for creating surface “algal scums”, which of course can severely impair lake aesthetics and clarity.

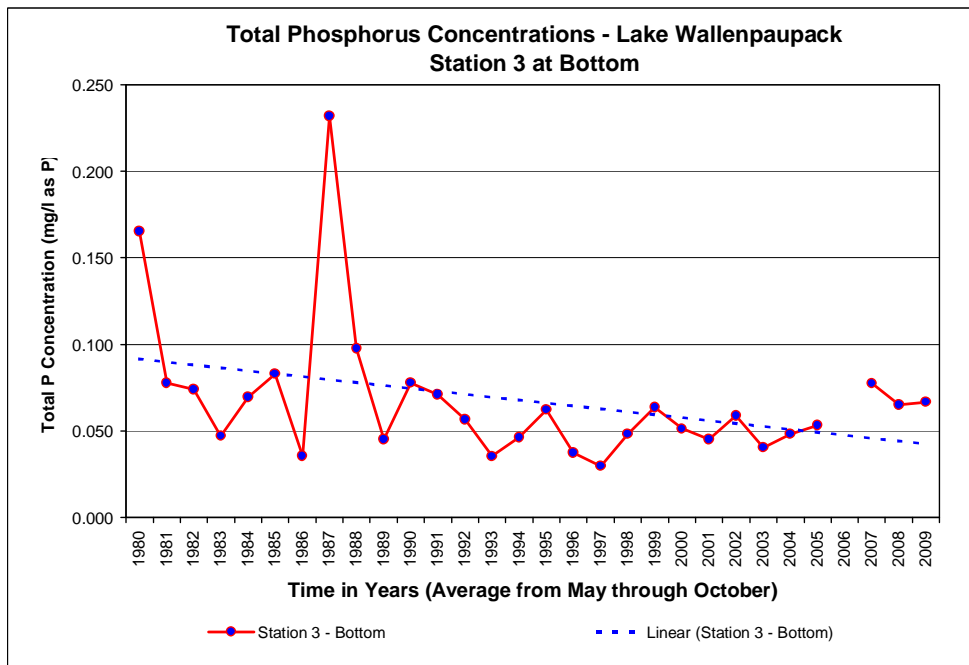
## **5.4. Chlorophyll-a**

The mean chlorophyll-a from 1980 through 2009 is shown in Figure 5.6. Figure 5.6 shows that chlorophyll-a concentrations have slightly increased since 1980. As noted in Section 5.3, the phytoplankton community appears to be more diversified and less dominated by nuisance blue-green algae (Cyanophytes). In general, blue-green algae often contain less chlorophyll-a when compared to other algal taxa like diatoms (Bacillariophytes) and especially green (Chlorophyta) algae.

**Lake Water Quality Monitoring Program for 2008-09  
Lake Wallenpaupack Watershed Management District**



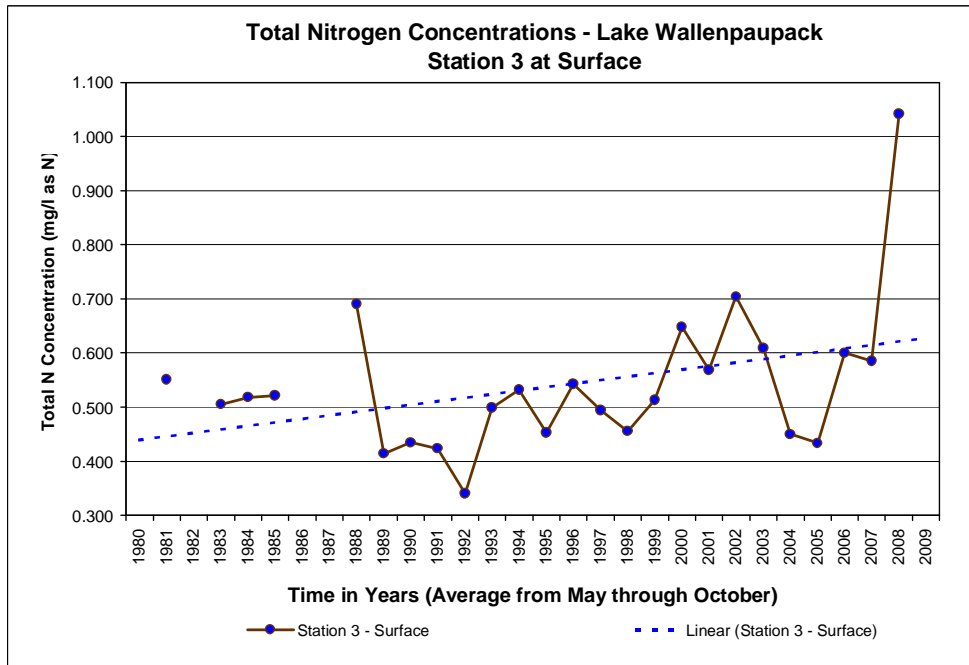
**Figure 5.1 Historical Total Phosphorus Concentrations in Surface Waters**



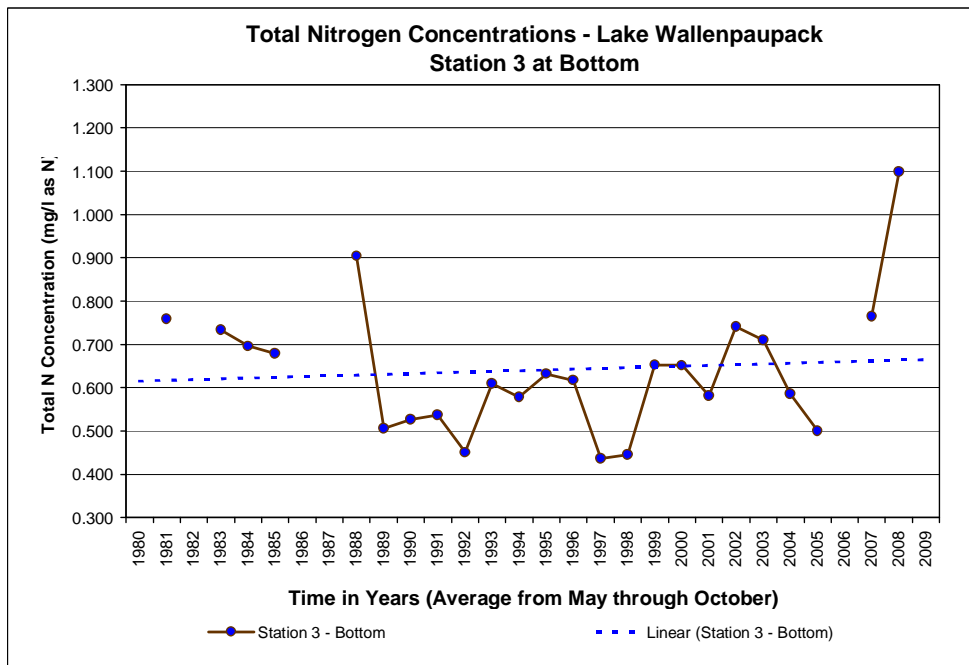
**Figure 5.2 Historical Total Phosphorus Concentrations in Bottom Waters**



**Lake Water Quality Monitoring Program for 2008-09  
Lake Wallenpaupack Watershed Management District**

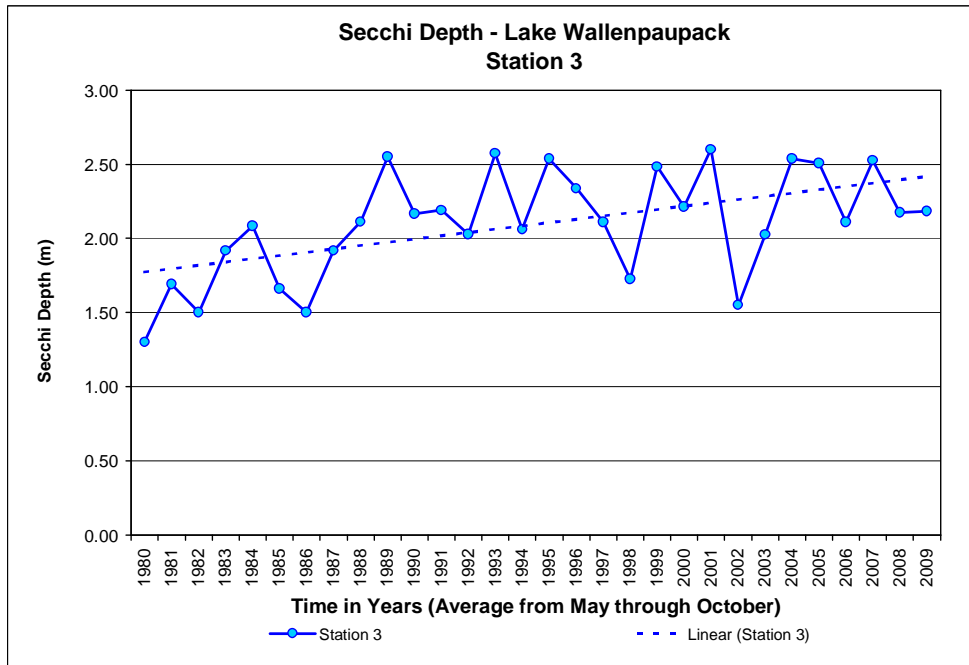


**Figure 5.3 Historical Total Nitrogen Concentrations in Surface Waters**

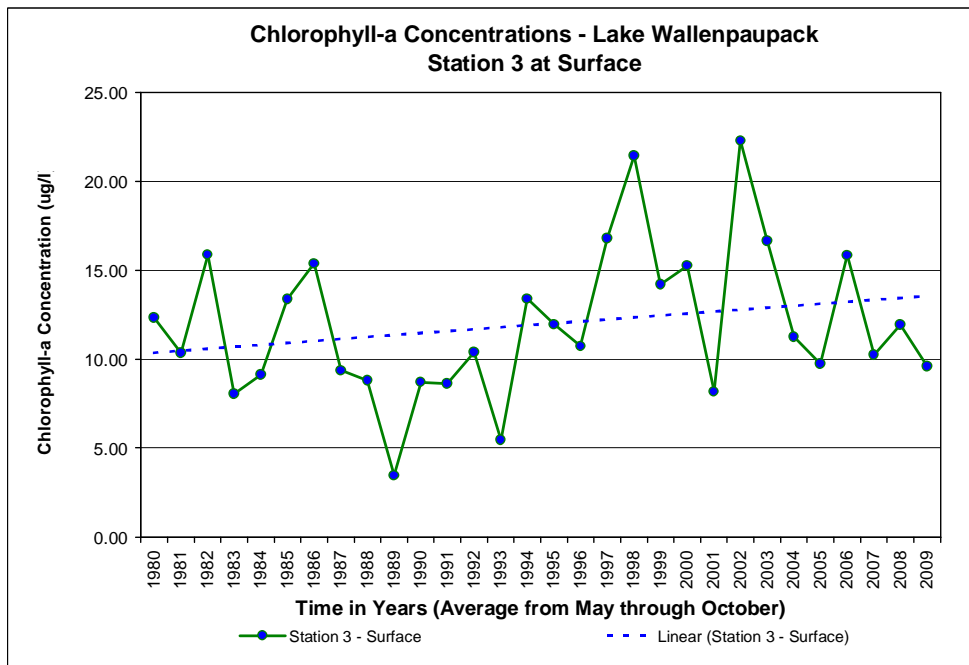


**Figure 5.4 Historical Total Nitrogen Concentrations in Bottom Waters**

**Lake Water Quality Monitoring Program for 2008-09  
Lake Wallenpaupack Watershed Management District**



**Figure 5.5 Historical Secchi Disk Transparency**



**Figure 5.6 Historical Chlorophyll-a Concentrations**

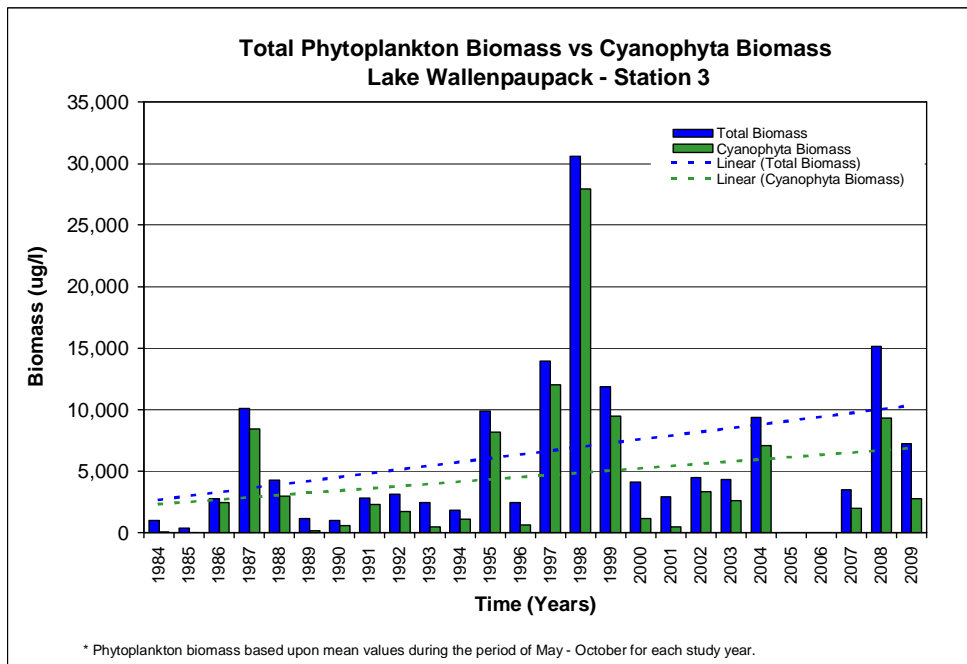
## 5.5. Phytoplankton & Zooplankton Biomass

The mean phytoplankton and zooplankton biomass from 1980 through 2009 is shown in Figures 5.7 and 5.8, respectively. Similar to chlorophyll-a, Figure 5.7 shows that phytoplankton biomass has slightly increased since 1980. Conversely, the zooplankton biomass has widely fluctuated and only a slight decrease in biomass was observed over the past 30 years.

Although the biomass has slightly increased, blue-green dominance (more species diversity) appears to be decreasing as shown in Figure 5.7. As noted in Section 5.3, this change in the phytoplankton community may be related to decreases in total phosphorus (Figures 5.1 and 5.2) and increases in total nitrogen (Figures 5.3 and 5.4). In general, higher nitrogen to phosphorus concentration ratios in lakes often favor green (Chlorophyta) over blue-green algae resulting in more species diversity and improved water clarity and aesthetics.

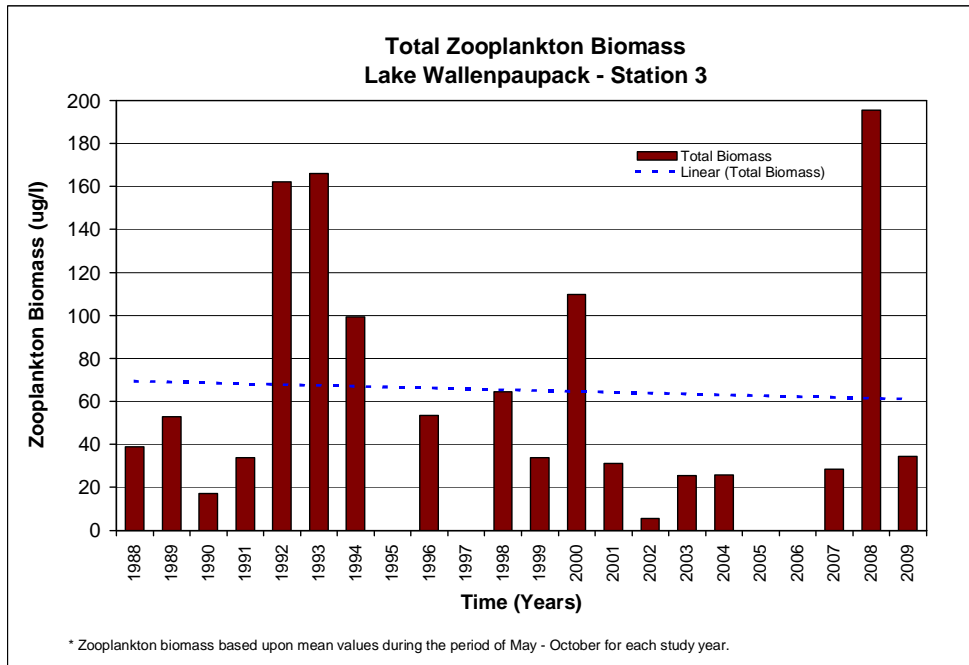
## 5.6. Carlson Trophic State Index Values

The mean Carlson Trophic State Index (TSI) values for total phosphorus, chlorophyll-a, and Secchi depth transparency from 1980 through 2009 is shown in Figures 5.9. As expected, the total phosphorus and Secchi transparency have gradually improved, while chlorophyll-a has marginally increased over the past 30 years.

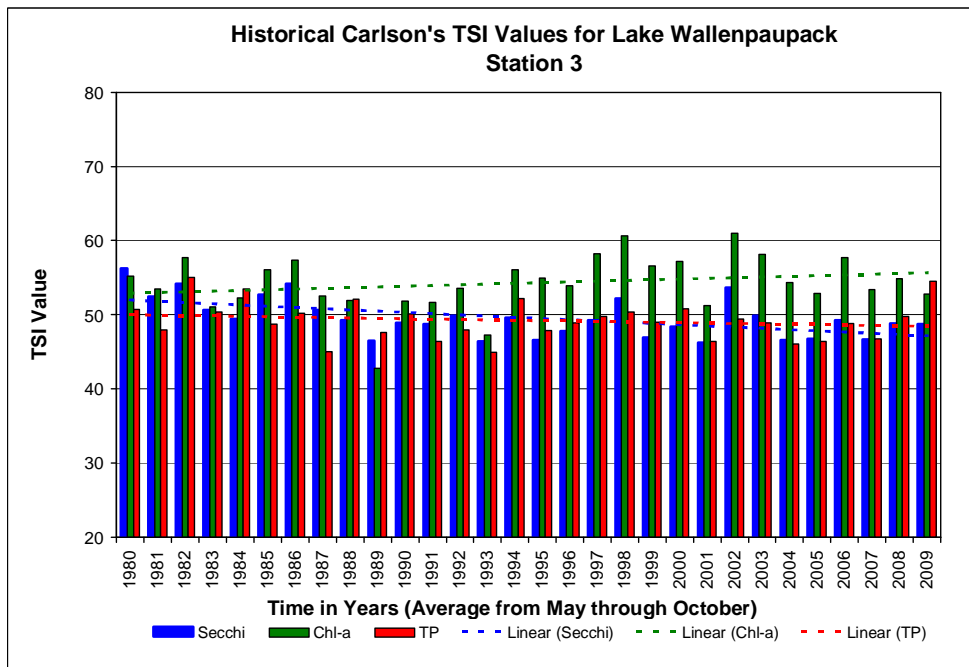


**Figure 5.7 Historical Phytoplankton Biomass**

**Lake Water Quality Monitoring Program for 2008-09  
Lake Wallenpaupack Watershed Management District**



**Figure 5.8 Historical Zooplankton Biomass**



**Figure 5.9 Historical Carlson's TSI Values**

## **5.7. Summary of Historical Lake Data**

Based upon trend analysis, the water quality of Lake Wallenpaupack has generally improved since 1980. Total phosphorus concentrations in surface and bottom waters and Secchi transparency (water clarity) have gradually improved over the past 30 years. In contrast, total nitrogen concentrations in surface and bottom waters marginally increased along with chlorophyll-a concentrations and phytoplankton biomass. The least amount of change was for zooplankton biomass, where only slight decreased in biomass was observed over time.

It is interesting to note that water clarity (Secchi transparency) actually improved even though chlorophyll-a concentrations and phytoplankton biomass increased. Improved water clarity may be related to a shift in the phytoplankton community, where nuisance blue-green algal dominance appears to be decreasing. This shift may be attributed to decreases in total phosphorus and increases in total nitrogen in the lake. In general, higher nitrogen to phosphorus concentration ratios in lakes often favor green (Chlorophyta) over blue-green (Cyanophyta) algae.

## **6. Conclusions and Recommendations**

Lake Wallenpaupack was classified as a slightly eutrophic reservoir in 2008 and 2009. The mean Carlson TSI values for total phosphorus, chlorophyll-a, and Secchi disk transparency were 49, 55, and 50, respectively, for 2008. The 2009 values were 49, 53, and 55, respectively. The lake was thermally stratified in 2008 and 2009 from May through September. In turn, the dissolved oxygen concentrations were strongly stratified when the lake was thermally stratified. In general, dissolved oxygen levels typically fell below 1 mg/L in the deeper lake waters portion (ranging from 8 to 14 meters or 26 to 46 ft).

Phytoplankton data indicate that blue-green algae (Cyanophyta) are dominant during the months of July through September in 2008 and 2009. The most common genus was *Anabaena*. Further observation concluded that zooplankton biomass also increased shortly after the phytoplankton biomass increased. This is a typical response where zooplankton numbers increase to graze down the higher than normal phytoplankton biomass, thereby resulting in a naturally balanced ecosystem.

Based upon trend analysis, the water quality of Lake Wallenpaupack has generally improved since 1980. Total phosphorus concentrations in surface and bottom waters and Secchi transparency (water clarity) have gradually improved. Total nitrogen concentrations in surface and bottom waters marginally increased along with chlorophyll-a concentrations and phytoplankton biomass.

Over the past 30 years, water clarity (Secchi transparency) increased although chlorophyll-a and phytoplankton biomass have slightly increased. This appears to be related to a shift in the phytoplankton community, where blue-green algal dominance is less prevalent. The shift in the phytoplankton community may be attributed to decreases in total phosphorus and increases in total nitrogen in the lake. In general, higher nitrogen to phosphorus concentration ratios in lakes often favor green (Chlorophyta) over blue-green (Cyanophyta) algae. In general, higher nitrogen to phosphorus concentration ratios in lakes often favor green (Chlorophyta) over blue-green algae resulting in more species diversity and improved water clarity and aesthetics.

Based upon the above conclusions, Aqua Link offers the following recommendations to the District:

1. Aqua Link should be retained to analyze the 2010 lake water quality data and prepare the annual lake report. All 2010 lake water quality data would be entered into the newly created historical lake water quality database, as developed by Aqua Link, and subsequently analyzed by Aqua Link
2. Aqua Link should be retained by the District to assist in all lake monitoring activities in 2011. Aqua Link would be responsible for collecting all *insitu* water quality data using our instrumentation and data loggers. This would allow all *insitu* data to be downloaded directly into the newly created lake water quality database, thereby eliminating the need for any manual data entry and possible data entry errors.

In addition, our senior aquatic biologists/lake managers will gain invaluable insight about the lake on each study date, which of course is extremely important when analyzing lake water quality data and preparing the annual reports. To reduce project costs, the District will continue to be responsible for providing a boat with an operator, collecting all lake water samples, and shipping these samples to the appropriate contract laboratories for analysis.

3. ECM, Inc. should be retained as the contract laboratory for all water quality analysis. ECM will be responsible for analyzing water samples for the following parameters: alkalinity, total phosphorus, dissolved reactive phosphorus, total Kjeldahl nitrogen, ammonia, nitrate, nitrite, total suspended solids and chlorophyll-a. The District should request that ECM use all Method Detection Limits (MDL) as established by Aqua Link for the 2010 lake monitoring program.

4. All phytoplankton and zooplankton samples should continue to be analyzed using the same methods used by Dr. Kenneth Wagner. All plankton data should be sent directly to Aqua Link in a Microsoft Excel format, thereby allowing us to easily import any newly acquired data into the water quality database for data analysis.
5. The lake should be monitored at Stations 3 and 5 in 2011. These stations should be monitored at least monthly from May through October. On each study date at each station, *insitu* water quality data (pH, dissolved oxygen, temperature, conductivity, specific conductance, total dissolved solids, and ORP) should be collected at one meter intervals throughout the water column. Secchi disk transparency will also be measured and recorded.

Lake water samples should be collected at two sampling depths (surface and bottom) at each lake station. Surface water quality samples should be collected and analyzed for the following parameters: alkalinity, total phosphorus, dissolved reactive phosphorus, total Kjeldahl nitrogen, ammonia, nitrate, nitrite, total suspended solids and chlorophyll-a. Bottom water quality samples will be collected and analyzed for the following parameters: alkalinity, total phosphorus, dissolved reactive phosphorus, total Kjeldahl nitrogen, ammonia, nitrate, nitrite, and total suspended solids. In addition, lake water samples should be collected for phytoplankton and zooplankton analysis. Phytoplankton samples should be collected as composited samples of the photic zone – defined as twice the Secchi depth. Zooplankton samples should be collected as vertical tows of the entire water column with a 80 micron plankton net.

## **7. Literature Cited**

- Amand, A. S. and K. W. Wagner. 1999. Collection, Identification and Ecology of Freshwater Algae. 19<sup>th</sup> Annual Symposium for Lake and Reservoir Management. North American Lake Management Society. Madison, WI.
- Carlson, R. E. 1977. A trophic state index for lakes. *Limnol. Oceanogr.* 22:361-369.
- Carlson, R. E. 1980. International Symposium on Inland Waters and Lake Restoration. EPA 440/5/81/010.
- Coastal Environmental Services. 1998. Comprehensive Lake and Watershed Management Plan for Fawn Lake. Prepared for the Fawn Lake Forest Association.
- Nurnberg, G. 2001. Eutrophication and Trophic State. *Lake Line*, Vol. 21, No. 1. North American Lake Management Society (NALMS), Madison, WI.
- U.S. EPA. 1980. Clean lakes program guidance manual. Report No. EPA-440/5-81-003. U.S. EPA, Washington, D.C.
- U.S. EPA. 1990. The Lake and Reservoir Restoration Guidance Manual, Second Edition. Report No. EPA-440/4-90-006. U.S. EPA, Washington, D.C.
- U.S. EPA. 1993. Fish and Fisheries Management in Lakes and Reservoirs - Technical Supplement to Lake and Reservoir Restoration Guidance Manual. Report No. EPA-841-R-93-002. U.S. EPA, Washington, D.C.



## **APPENDIX A**

# **Glossary of Lake & Watershed Management Terms**

## Glossary

**Algae** - Mostly aquatic, non-vascular plants that float in the water or attach to larger plants, rocks, and other substrates. Also called phytoplankton, these individuals are usually visible only with a microscope. They are a normal and necessary component of aquatic life, but excessive numbers can make the water appear cloudy and colored.

**Alkalinity** - The acid-neutralizing capacity of water. It is primarily a function of the carbonate, bicarbonate, and hydroxide content in water. The lower the alkalinity, the less capacity the water has to absorb acids without becoming more acidic.

**Ammonia (NH<sub>3</sub>)** - A nitrogen-containing substance which may indicate recently decomposed plant or animal material.

**Benthos** - The communities of aquatic life which dwell in or on the bottom sediments of a water body.

**Chlorophyll** - Pigments (mostly green) in plants, including algae, that play an important part in the chemical reactions of photosynthesis. A measurement of chlorophyll-a (one type of chlorophyll) is commonly used as a measure of the algae content of water.

**Conductivity (Cond)** - A measure of water's capacity to convey an electric current. It is related to the total amount of dissolved charged substances in the water. Therefore, it can be used as a general indicator of the quality of the water and can also suggest presence of unidentified material in the water. It is often used as a surrogate for salinity measurements.

**Combined Sewer Overflow (CSO)** - Discharges of combined sewage and stormwater into water bodies during very wet or storm weather. These discharges occur to relieve the sewer system as it becomes overloaded with normal sewer flow and increased storm run-off. The term is also used to denote a pipe that discharges those overflows.

**Dissolved oxygen (DO)** - Oxygen that is dissolved in the water. Certain amounts are necessary for life processes of aquatic animals. The oxygen is supplied by the photosynthesis of plants, including algae, and by aeration. Oxygen is consumed by animals and plants at night, and bacterial decomposition of dead organic matter (plant matter and animal waste).

**Effluent** - Liquids discharged from sewage treatment plants, septic systems, or industrial sources to surface waters.

**Epilimnion** - The warmer, well-lit surface waters of a lake that are thermally separated from the colder (hence denser), water at the bottom of the lake when a lake is stratified.

**Eutrophication** - The acceleration of the loading of nutrients to a lake by natural or human-induced causes. The increased rate of delivery of nutrients results in increased production of algae and consequently, poor water transparency. Human-induced (cultural) eutrophication may be caused by input of treated sewage to a lake, deforestation of a watershed, or the urbanization of a watershed.

**Fecal Coliform Bacteria** - Bacteria from the intestines of warm-blooded animals. Most of the bacteria are not in themselves harmful, so they are measured or counted as an indicator of the possible presence of harmful bacteria.

**Groundwater** - Water stored beneath the surface of the earth. The water in the ground is supplied by the seepage of rainwater, snowmelt, and other surface water into the soil. Some groundwater may be found far beneath the earth surface, while other groundwater may be only a few inches from the surface. Groundwater discharges into lowland streams to maintain their baseflow.

**Hydrology** -The science dealing with the properties, distribution and circulation of water. The term usually refers to the flow of water on or below the land surface before reaching a stream or man-made structure.

**Hypolimnion** - The dark, cold, bottom waters of a lake that are thermally separated from the warmer (hence less dense) surface waters when a lake is stratified.

**Invertebrates** - Animals without internal skeletons. Some require magnification to be seen well, while others such as worms, insects, and crayfish are relatively large. Invertebrates living in stream and lake sediments are collected as samples to be identified and counted. In general, more varied invertebrate communities indicate healthier water bodies.

**Limiting nutrient** - The nutrient that is in lowest supply relative to the demand. The limiting nutrient will be exhausted first by algae which require many nutrients and light to grow. Inputs of the limiting nutrient will result in increased algal production, but as soon as the limiting nutrient is exhausted, growth stops. Phytoplankton growth in lake waters of temperate lowland areas is generally phosphorus limited.

**Limnology** - Scientific study of inland waters.

**Littoral zone** - portion of a water body extending from the shoreline lakeward to the greatest depth occupied by rooted plants.

**Loading rate** - Addition of a substance to a water body; or the rate at which the addition occurs. For example, streams load nutrients to lakes at various rates as in "500 kilograms per year (500 kg/yr)" or "227 pounds per year (227 lb/yr)."

**Macrophytes** - rooted and floating aquatic plants, larger (macro-) than the phytoplankton.

**Mesotrophic** - A condition of lakes that is characterized by moderate concentrations of nutrients, algae, and water transparency. A mesotrophic lake is not as rich in nutrients as a eutrophic lake, but richer in nutrients than an oligotrophic lake.

**Monomictic** - A lake which has one mixing and one stratification event per year. If a lake does not freeze over in the winter, the winter winds will mix the waters of the lake. In summer, the lake resists mixing and becomes stratified because the surface waters are warm (light) and the bottom waters are cold (dense). Deep lakes in the Puget lowlands are monomictic lakes.

**Nitrate, nitrite (NO<sub>3</sub>, NO<sub>2</sub>)** - Two types of nitrogen compounds. These nutrients are forms of nitrogen that algae may use for growth.

**Nitrogen** - One of the elements essential as a nutrient for growth of organisms.

**Non-point source pollution** - Pollution that originates from diffuse areas and unidentifiable sources, such as agriculture, the atmosphere, or ground water.

**Nutrients** - Elements or compounds essential for growth of organisms.

**Oligotrophic** - A condition of lakes characterized by low concentrations of nutrients and algae and resulting good water transparency. An oligotrophic lake has less nutrients than a mesotrophic or eutrophic lake.

**Pathogens** -Microorganisms that can cause disease in other organisms or humans, animals, and plants. Pathogens include bacteria, viruses, fungi, or parasites found in sewage, in runoff from farms or city streets, and in water used for swimming. Pathogens can be present in municipal, industrial, and nonpoint source discharges.

**Pelagic Zone** - Deep, open water area of a lake away from the edge of the littoral zone towards the center of the lake.

**pH** - Measure of the acidity of water on a scale of 0 to 14, with 7 representing neutral water. A pH less than 7 is considered acidic and above 7 is basic.

**Phosphorus** - One of the elements essential as a nutrient for the growth of organisms. In western Washington lakes, it is usually the algae nutrient in shortest supply relative to the needs of the algae. Phosphorus occurs naturally in soils, as well as in organic material. Various measures of phosphorus in water samples are made, including total-phosphorus (TP) and the dissolved portion of the phosphorus (orthophosphorus).

**Photic zone** - The lighted region of a lake where photosynthesis occurs.

**Phytoplankton** - Floating, mostly microscopic algae (plants) that live in water.

**Point-source Pollution** - An input of pollutants into a water body from discrete sources, such as municipal or industrial outfalls.

**Primary Treatment** - The first stage of wastewater treatment involving removal of debris and solids by screening and settling.

**Pump Station** -A structure used to move wastewater uphill, against gravity.

**Regulator** -A structure that controls the flow of wastewater from two or more input pipes to a single output. Regulators can be used to restrict or halt flow, thus causing wastewater to be stored in the conveyance system until it can be handled by the treatment plant.

**Salmonids** - Salmon, trout, char and whitefish species of fish.

**Secchi depth** - Measure of transparency of water obtained by lowering a 10 cm black and white disk into water until it is no longer visible.

**Secondary Treatment** - Following primary treatment, bacteria are used to consume organic wastes. Wastewater is then disinfected and discharged through an outfall.

**Separation** -A method for controlling combined sewer overflow whereby the combined sewer is separated into both a sanitary sewer and a storm drain, as is the practice in new development.

**Sewage** -That portion of wastewater that is composed of human and industrial wastes from homes, businesses, and industries.

**Standard** - A legally established allowable limit for a substance or characteristic in the water, based on criteria. Enforcement actions by the appropriate agencies can be taken against parties who cause violations.

**Stratification of lakes** - A layering effect produced by the warming of the surface waters in many lakes during summer. Upper waters are progressively warmed by the sun and the deeper waters remain cold. Because of the difference in density (warmer water is lighter), the two layers remain separate from each other: upper waters "float" on deeper waters and wind induced mixing occurs only in the upper waters. Oxygen in the bottom waters may become depleted. In autumn as the upper waters cool, the whole lake mixes again and remains mixed throughout the winter, or until it freezes over.

**Stormwater** -Water that is generated by rainfall and is often routed into drain systems.

**Thermocline** - Depth in a stratified lake where the greatest change in temperature occurs. Separates the epilimnion from the hypolimnion

**Total suspended solids (TSS)** - Particles, both mineral (clay and sand) and organic (algae and small pieces of decomposed plant and animal material), that are suspended in water.

**Toxic** -Causing death, disease, cancer, genetic mutations, or physical deformations in any organism or its offspring upon exposure, ingestion, inhalation, or assimilation.

**Transparency** - A measure of the clarity of water in a lake, which is measured by lowering a standard black and white Secchi disk into the water and recording the depth at which it is no longer visible. Transparency of lakes is determined by the color of the water and the amount of material suspended in it. Generally in colorless waters of the Puget lowland, the transparency of the water in summer is determined by the amount of algae present in the water. Suspended silt particles may also have an effect, particularly in wet weather.

**Trophic status** - Rating of the condition of a lake on the scale of oligotrophic-mesotrophic-eutrophic (see definition of these terms).

**Turbidity** - Cloudiness of water caused by the suspension of minute particles, usually algae, silt, or clay.

**Wastewater** -Total flow within the sewage system. In combined systems, it includes sewage and stormwater.

**Water Column** - Water in a lake between the surface and sediments. Used in vertical measurements used to characterize lake water.

**Watershed** - The areas that drain to surface water bodies, including lakes, rivers, estuaries, wetlands, streams, and the surrounding landscape.

**Water of Statewide Significance** - Legal term from the state Shoreline Management act, which recognizes particular bodies of water and sets criteria and standards for their protection.

**Zooplankton** - Small, free swimming or floating animals in water, many are microscopic.

## **APPENDIX B**

### **Primer on Lake Ecology & Watershed Concepts**

## **A Primer on Lake Ecology & Watershed Concepts**

***Prepared by Aqua Link, Inc.***

A glossary of lake and watershed terms is provided in Appendix A (U.S. EPA 1980). This glossary is intended to serve as an aid to understanding this section and contains many of the technical terms used throughout the remainder of this report.

The water quality of a lake is often described as a reflection of its surrounding watershed. The term “lake” collectively refers to both reservoirs (man-made impoundments) and natural lake systems. Water from the surrounding watershed enters a lake as streamflow, surface runoff and groundwater. The water quality of these water sources is greatly influenced by the characteristics of the watershed such as, geology, soils, topography and land use. Of these characteristics, changes in land use (e.g., forested, agriculture, silviculture, residential, commercial, industrial) can greatly alter the water quality of lakes.

Nutrients (e.g., phosphorus, nitrogen, carbon, silicon, calcium, potassium, magnesium, sulfur, sodium, chloride, iron) are primarily transported to lakes via streamflow, surface runoff and groundwater while sediments are mainly conveyed as streamflow and surface runoff. As streamflow and surface runoff enter a lake, their overall velocity decreases, which allows transported sediments to settle to the lake bottom. Many of these incoming nutrients may be bound to sediment particles and subsequently will also settle to the lake bottom. Very small sediment particles, such as clays, may resist sedimentation and subsequently pass through the lake without settling.

Once within the lake, water quality is further modified through a complex set of physical, chemical and biological processes. These processes are significantly affected by the lake’s morphological characteristics (morphology). Some of the more important morphological characteristics of lakes are size, shape, depth, volume, and bottom composition. In addition, the hydraulic residence time (i.e., the lake’s flushing rate) also greatly affects these processes and is directly related to the lake’s volume and the annual volume of water flowing into the lake.

With respect to nutrients, phosphorus and nitrogen are generally considered the most important nutrients in freshwater lakes. Phosphorus and, to a lesser degree, nitrogen typically determines the overall amount of aquatic plants present. Aquatic plants adsorb and convert available nutrients into energy, which is then used for additional growth and reproduction. In lakes, aquatic plants are mainly comprised of phytoplankton (free-floating microscopic plants or algae) and macrophytes (higher vascular plants). The most readily available form of phosphorus is dissolved orthophosphate (analytical determined as dissolved reactive phosphorus), while ammonia (NH<sub>3</sub>-N) and nitrate (NO<sub>3</sub>-N) are the most readily available forms of nitrogen.

The transfer and flow of energy in lakes is ultimately controlled by complex interactions between various groups of aquatic organisms (both plants and animals). The feeding interactions that exist between all aquatic organisms is called the food web. A simplistic diagram of a food chain for a lake is presented as Figure 3.1. As shown in this figure, algae (phytoplankton) and aquatic macrophytes capture energy from the sun and convert this energy into chemical energy through the process known as photosynthesis. During photosynthesis, carbon dioxide, nutrients, water and captured sunlight energy are used to produce organic compounds (chemical energy), which are then used to support further growth and reproduction.

Energy continues to flow upward through the food chain. Algae are primarily grazed upon by zooplankton. Zooplankton are tiny aquatic animals that are barely visible to the naked eye. Next, zooplankton serve as prey for planktivorous (plankton-eating) fish and larger invertebrates (macroinvertebrates), which then are consumed by larger piscivorous (fish-eating) fish. Overall, these aquatic organisms (zooplankton, macroinvertebrates and fish) derive energy by breaking down organic matter through the process known as respiration. During respiration, organic matter, water and dissolved oxygen are converted into carbon dioxide and nutrients.

At the bottom of the food chain (Figure 3.1), particulate organic waste products (excrement) from aquatic organisms along with dead aquatic organisms settle to the lake bottom and are subsequently feed upon by other organisms. Organisms that live or reside along the lake bottom are referred to as benthivores. After settling to the lake bottom, dead organic materials and organic waste products are now called detritus. Some benthivorous fish (catfish and carp) and microorganisms (bacteria, fungi and protozoans) feed upon detritus. Aquatic organisms that feed upon detritus in lakes are referred to as decomposers. Decomposers obtain energy by breaking down detritus (dead organic matter) via the process of respiration. During decomposition, some of the nutrients are recycled back into lake water and can now once again be used by algae and aquatic plants for growth and reproduction. Any unused detritus will accumulate and eventually become part of the lake sediments, thereby increasing the organic content of these sediments.

Ultimately, the amount of nutrients in lakes controls the overall degree of aquatic productivity (Figure 3.1). Lakes with low levels of nutrients and low levels of aquatic productivity are referred to as oligotrophic. Oligotrophic lakes are typically clear and deep with low quantities of phytoplankton and rooted aquatic plants. In these lakes, the deeper, colder waters are generally well-oxygenated and capable of supporting coldwater fish, such as trout. Conversely, lakes with high nutrient levels and high levels of aquatic productivity are referred to as eutrophic. Eutrophic lakes are generally more



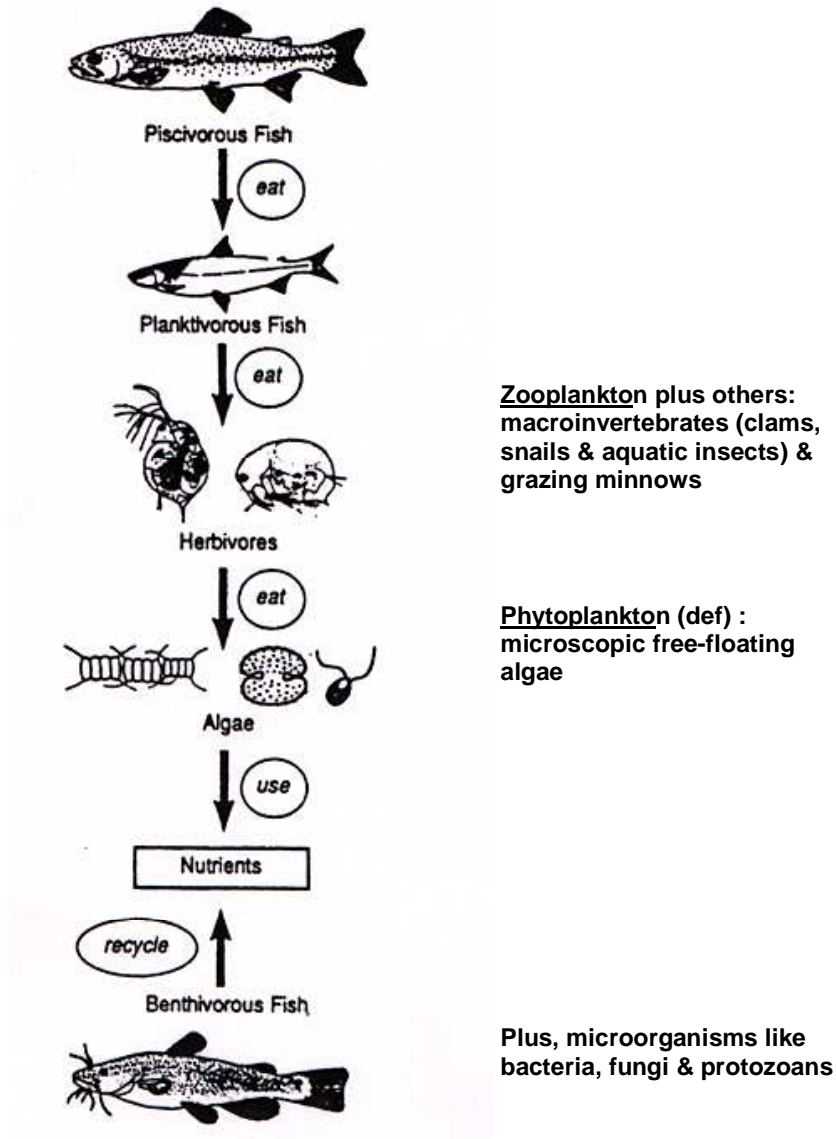


Figure 1 Aquatic Food Chain

turbid and shallower due to the deposition of sediments and the accumulation of detritus. If deep enough, the bottom waters of eutrophic lakes are generally less oxygenated. Eutrophic lakes are often capable of supporting warmwater fish, such as bluegill and bass. Mesotrophic lakes lie somewhere in

***Lake Water Quality Monitoring Program for 2008-09  
Lake Wallenpaupack Watershed Management District***

---

between oligotrophic and eutrophic lakes. These lakes contain moderate levels of nutrients and moderate levels of aquatic productivity. In some instances, the flow of energy through the food web may be disrupted. In hyper-eutrophic (highly eutrophic) lakes, aquatic productivity is extremely high and is dominated by very large numbers of a few, undesirable species. The phytoplankton community is typically comprised largely by blue-green algae during the summer months. Many species of blue-green algae are not readily grazed upon by the zooplankton community. Under these conditions, the blue-green algae community is allowed to flourish due to the lack of predation, while the zooplankton community collapses. Decreases in zooplankton biomass in a lake may in turn adversely affect the lake's fishery. In addition, shallow lake areas may be completely infested with dense stands of aquatic macrophytes and the fishery may be dominated by rough fish such as the common carp and catfish.

## **APPENDIX C**

### **2008-09 Lake Water Quality Data**

Key to Water Quality Parameters and Units of Measure

Parameter:	Units of Measure:
pH (pH)	Expressed in Standard Units (s.u.)
Alkalinity (Alk)	Expressed in milligrams per liter as calcium carbonate(mg/l as CaCO <sub>3</sub> )
Hardness	Expressed in milligrams per liter as calcium carbonate(mg/l as CaCO <sub>3</sub> )
Conductivity (Cond)	Expressed in micromhos per cm (umhos/cm)
Conductivity (Cond)	Expressed in microsiemens per cm (uS/cm)
Specific Conductance (Sp Cond)	Expressed in micromhos per cm (umhos/cm) @ 25.0 degrees Celsius
Total Phosphorus (TP)	Expressed as milligrams per liter as phosphorus (mg/l as P)
Dissolved Reactive Phosphorus (DRP)	Expressed in milligrams per liter as phosphorus (mg/l as P)
Nitrate (NO <sub>3</sub> )	Expressed in milligrams per liter as nitrogen (mg/l as N)
Nitrite (NO <sub>2</sub> )	Expressed in milligrams per liter as nitrogen (mg/l as N)
Ammonia nitrogen (NH <sub>3</sub> )	Expressed in milligrams per liter as nitrogen (mg/l as N)
Total Kjeldahl Nitrogen (TKN)	Expressed in milligrams per liter as nitrogen (mg/l as N)
Total Suspended Solids (TSS)	Expressed in milligrams per liter (mg/l)
Turbidity	Expressed in ntu's (nephelometric turbidity units)
Color	Expressed in Pt/Co Units
Oil & Grease	Expressed in milligrams per liter (mg/l)
Iron (Fe) total/dissolved	Expressed in milligrams per liter (mg/l)
Manganese (Mn) total/dissolved	Expressed in milligrams per liter (mg/l)
Dissolved Oxygen (Dissol Oxy)	Expressed in milligrams per liter (mg/l)
Temperature (Temp)	Expressed in degrees Celsius (degrees C)
Secchi Disk Depth	Expressed in meters (m)
Chlorophyll-a	Expressed in micrograms per liter (ug/l)
Fecal coliform bacteria (FC)	Expressed as number of organisms per one hundred milliliters (No./100 ml)
Fecal streptococcus bacteria (FS)	Expressed as number of organisms per one hundred milliliters (No./100 ml)
Phytoplankton	Expressed as number of organisms per liter (No.per ml)
Phytoplankton	Expressed as biomass in micrograms per liter (ug/l)

LWWMD Water Quality Data - 2008  
 ALI Customer No. 1157-03

Insitu Water Quality Data - Lake Wallenpaupack - All Stations  
 Prepared by Aqua Link, Inc.

Database Last Modified: 02/11/11  
 Staff Initials: arl

Insitu Water Quality Data - Station No. 3

Date M/D/Y	Time hh:mm:ss	Site	Depth m	Temp C	DO% %	DO Conc mg/L	Cond uS/cm	SpCond uS/cm	pH s.u.	TDS g/L	Salinity ppt	ORP mV	Conversions	
													Depth (feet)	Temp (Degrees F)
3/31/2008	10:10:00	3	0.00	3.55		12.59		55	6.90				0.00	38.4
3/31/2008	10:10:00	3	1.00	3.57		12.55		55	7.00				3.28	38.4
3/31/2008	10:10:00	3	2.00	3.57		12.55		55	6.99				6.56	38.4
3/31/2008	10:10:00	3	3.00	3.57		12.91		55	6.97				9.84	38.4
3/31/2008	10:10:00	3	4.00	3.58		12.51		55	6.90				13.12	38.4
3/31/2008	10:10:00	3	5.00	3.58		12.50		55	6.90				16.40	38.4
3/31/2008	10:10:00	3	6.00	3.59		12.49		55	6.88				19.68	38.5
3/31/2008	10:10:00	3	7.00	3.6		12.48		55	6.88				22.97	38.5
3/31/2008	10:10:00	3	8.00	3.64		12.48		55	6.88				26.25	38.6
3/31/2008	10:10:00	3	9.00	3.65		12.45		55	6.87				29.53	38.6
3/31/2008	10:10:00	3	10.00	3.65		12.44		55	6.87				32.81	38.6
3/31/2008	10:10:00	3	11.00	3.65		12.44		55	6.87				36.09	38.6
3/31/2008	10:10:00	3	12.00	3.66		12.44		55	6.67				39.37	38.6
3/31/2008	10:10:00	3	13.00	3.66		12.37		55	6.62				42.65	38.6
3/31/2008	10:10:00	3	14.00	3.67		12.33		55	6.59				45.93	38.6
3/31/2008	10:10:00	3	15.00	3.67		12.29		55	6.50				49.21	38.6
3/31/2008	10:10:00	3	16.00	3.68		12.82		55	6.46				52.49	38.6
<<insert>>														
<b>Min</b>			0.0	3.55		12.29		55	6.46				0.00	38.4
<b>Max</b>			16.0	3.68		12.91		55	7.00				52.49	38.6
<b>Max - Min</b>			16.0	0.13		0.62		0	0.54				52.49	0.2
<b>Count</b>			17	17	17	17		17	17				17	17

LWWMD Water Quality Data - 2008  
 ALI Customer No. 1157-03

Insitu Water Quality Data - Lake Wallenpaupack - All Stations  
 Prepared by Aqua Link, Inc.

Database Last Modified: 02/11/11  
 Staff Initials: arl

Insitu Water Quality Data - Station No. 3

Date M/D/Y	Time hh:mm:ss	Site	Depth m	Temp C	DO% %	DO Conc mg/L	Cond uS/cm	SpCond uS/cm	pH s.u.	TDS g/L	Salinity ppt	ORP mV	Conversions	
													Depth (feet)	Temp (Degrees F)
4/21/2008	13:15:00	3	0.00	11.35		13.60		68	7.61				0.00	52.4
4/21/2008	13:15:00	3	1.00	11.36		13.32		67	7.59				3.28	52.4
4/21/2008	13:15:00	3	2.00	11.28		13.06		67	7.57				6.56	52.3
4/21/2008	13:15:00	3	3.00	10.79		13.07		68	7.55				9.84	51.4
4/21/2008	13:15:00	3	4.00	10.43		12.93		65	7.52				13.12	50.8
4/21/2008	13:15:00	3	5.00	10.36		12.81		65	7.49				16.40	50.6
4/21/2008	13:15:00	3	6.00	10.07		12.76		65	7.45				19.68	50.1
4/21/2008	13:15:00	3	7.00	10.04		12.71		63	7.37				22.97	50.1
4/21/2008	13:15:00	3	8.00	7.08		13.07		60	7.32				26.25	44.7
4/21/2008	13:15:00	3	9.00	7.02		12.01		60	7.16				29.53	44.6
4/21/2008	13:15:00	3	10.00	6.97		11.80		60	7.13				32.81	44.5
4/21/2008	13:15:00	3	11.00	6.97		11.60		60	7.09				36.09	44.5
4/21/2008	13:15:00	3	12.00	6.97		11.53		60	7.07				39.37	44.5
4/21/2008	13:15:00	3	13.00	6.97		11.41		60	7.04				42.65	44.5
4/21/2008	13:15:00	3	14.00	6.98		11.38		60	7.00				45.93	44.6
4/21/2008	13:15:00	3	15.00	6.97		11.35		60	6.92				49.21	44.5
4/21/2008	13:15:00	3	16.00	6.96		11.28		60	6.90				52.49	44.5
<<insert>>														
<b>Min</b>			0.0	6.96		11.28		60	6.90				0.00	44.5
<b>Max</b>			16.0	11.36		13.60		68	7.61				52.49	52.4
<b>Max - Min</b>			16.0	4.40		2.32		8	0.71				52.49	7.9
<b>Count</b>		17	17	17		17		17	17				17	17

LWWMD Water Quality Data - 2008  
 ALI Customer No. 1157-03

Insitu Water Quality Data - Lake Wallenpaupack - All Stations  
 Prepared by Aqua Link, Inc.

Database Last Modified: 02/11/11  
 Staff Initials: arl

Insitu Water Quality Data - Station No. 3

Date M/D/Y	Time hh:mm:ss	Site	Depth m	Temp C	DO% %	DO Conc mg/L	Cond uS/cm	SpCond uS/cm	pH s.u.	TDS g/L	Salinity ppt	ORP mV	Conversions	
													Depth (feet)	Temp (Degrees F)
5/20/2008	11:30:00	3	0.00										0.00	32.0
5/20/2008	11:30:00	3	1.00	12.60		10.12							3.28	54.7
5/20/2008	11:30:00	3	2.00	12.60		10.18							6.56	54.7
5/20/2008	11:30:00	3	3.00	12.60		10.24							9.84	54.7
5/20/2008	11:30:00	3	4.00	12.60		10.28							13.12	54.7
5/20/2008	11:30:00	3	5.00	12.50		9.86							16.40	54.5
5/20/2008	11:30:00	3	6.00	12.40		9.91							19.68	54.3
5/20/2008	11:30:00	3	7.00	12.40		9.90							22.97	54.3
5/20/2008	11:30:00	3	8.00	12.30		10.04							26.25	54.1
5/20/2008	11:30:00	3	9.00	12.00		9.20							29.53	53.6
5/20/2008	11:30:00	3	10.00	10.50		8.05							32.81	50.9
5/20/2008	11:30:00	3	11.00	9.30		7.20							36.09	48.7
5/20/2008	11:30:00	3	12.00	8.70		6.43							39.37	47.7
5/20/2008	11:30:00	3	13.00	8.50		1.68							42.65	47.3
5/20/2008	11:30:00	3	14.00	8.90		0.00							45.93	48.0
5/20/2008	11:30:00	3	15.00	9.10		0.00							49.21	48.4
5/20/2008	11:30:00	3	16.00	9.00		0.00							52.49	48.2
<<insert>>														
<b>Min</b>			0.0	8.50		0.00							0.00	32.0
<b>Max</b>			16.0	12.60		10.28							52.49	54.7
<b>Max - Min</b>			16.0	4.10		10.28							52.49	22.7
<b>Count</b>		17	17	16		16							17	17

LWWMD Water Quality Data - 2008  
 ALI Customer No. 1157-03

Insitu Water Quality Data - Lake Wallenpaupack - All Stations  
 Prepared by Aqua Link, Inc.

Database Last Modified: 02/11/11  
 Staff Initials: arl

Insitu Water Quality Data - Station No. 3

Date M/D/Y	Time hh:mm:ss	Site	Depth m	Temp C	DO% %	DO Conc mg/L	Cond uS/cm	SpCond uS/cm	pH s.u.	TDS g/L	Salinity ppt	ORP mV	Conversions	
													Depth (feet)	Temp (Degrees F)
5/28/2008	12:27:00	3	0.00	14.80		10.45							0.00	58.6
5/28/2008	12:27:00	3	1.00	14.90		10.69							3.28	58.8
5/28/2008	12:27:00	3	2.00	14.80		10.21							6.56	58.6
5/28/2008	12:27:00	3	3.00	14.50		10.35							9.84	58.1
5/28/2008	12:27:00	3	4.00	14.30		10.25							13.12	57.7
5/28/2008	12:27:00	3	5.00	13.90		10.25							16.40	57.0
5/28/2008	12:27:00	3	6.00	13.50		10.10							19.68	56.3
5/28/2008	12:27:00	3	7.00	12.90		9.85							22.97	55.2
5/28/2008	12:27:00	3	8.00	12.60		9.85							26.25	54.7
5/28/2008	12:27:00	3	9.00	12.40		9.40							29.53	54.3
5/28/2008	12:27:00	3	10.00	11.80		8.60							32.81	53.2
5/28/2008	12:27:00	3	11.00	11.00		6.67							36.09	51.8
5/28/2008	12:27:00	3	12.00	10.90		6.57							39.37	51.6
<<insert>>														
<b>Min</b>			0.0	10.90		6.57							0.00	51.6
<b>Max</b>			12.0	14.90		10.69							39.37	58.8
<b>Max - Min</b>			12.0	4.00		4.12							39.37	7.2
<b>Count</b>		13	13	13		13							13	13



LWWMD Water Quality Data - 2008  
 ALI Customer No. 1157-03

Insitu Water Quality Data - Lake Wallenpaupack - All Stations  
 Prepared by Aqua Link, Inc.

Database Last Modified: 02/11/11  
 Staff Initials: arl

Insitu Water Quality Data - Station No. 3

Date M/D/Y	Time hh:mm:ss	Site	Depth m	Temp C	DO% %	DO Conc mg/L	Cond uS/cm	SpCond uS/cm	pH s.u.	TDS g/L	Salinity ppt	ORP mV	Conversions	
													Depth (feet)	Temp (Degrees F)
6/8/2008	12:24:00	3	0.00	25.40		8.84							0.00	77.7
6/8/2008	12:24:00	3	1.00	25.20		8.77							3.28	77.4
6/8/2008	12:24:00	3	2.00	25.00		8.86							6.56	77.0
6/8/2008	12:24:00	3	3.00	24.70		8.59							9.84	76.5
6/8/2008	12:24:00	3	4.00	24.30		8.28							13.12	75.7
6/8/2008	12:24:00	3	5.00	23.10		8.00							16.40	73.6
6/8/2008	12:24:00	3	6.00	20.50		6.48							19.68	68.9
6/8/2008	12:24:00	3	7.00	17.90		5.40							22.97	64.2
6/8/2008	12:24:00	3	8.00	15.40		5.11							26.25	59.7
6/8/2008	12:24:00	3	9.00	13.40		2.11							29.53	56.1
6/8/2008	12:24:00	3	10.00	12.50		0.82							32.81	54.5
6/8/2008	12:24:00	3	11.00	11.70		0.11							36.09	53.1
6/8/2008	12:24:00	3	12.00	11.50		0.01							39.37	52.7
<<insert>>														
<b>Min</b>			0.0	11.50		0.01							0.00	52.7
<b>Max</b>			12.0	25.40		8.86							39.37	77.7
<b>Max - Min</b>			12.0	13.90		8.85							39.37	25.0
<b>Count</b>		13	13	13		13							13	13

LWWMD Water Quality Data - 2008  
 ALI Customer No. 1157-03

Insitu Water Quality Data - Lake Wallenpaupack - All Stations  
 Prepared by Aqua Link, Inc.

Database Last Modified: 02/11/11  
 Staff Initials: arl

Insitu Water Quality Data - Station No. 3

Date M/D/Y	Time hh:mm:ss	Site	Depth m	Temp C	DO% %	DO Conc mg/L	Cond uS/cm	SpCond uS/cm	pH s.u.	TDS g/L	Salinity ppt	ORP mV	Conversions	
													Depth (feet)	Temp (Degrees F)
6/16/2008	12:15:00	3	0.00	25.10		8.15							0.00	77.2
6/16/2008	12:15:00	3	1.00	24.90		8.33							3.28	76.8
6/16/2008	12:15:00	3	2.00	24.60		8.25							6.56	76.3
6/16/2008	12:15:00	3	3.00	24.30		8.55							9.84	75.7
6/16/2008	12:15:00	3	4.00	23.40		8.29							13.12	74.1
6/16/2008	12:15:00	3	5.00	19.90		9.34							16.40	67.8
6/16/2008	12:15:00	3	6.00	17.30		9.42							19.68	63.1
6/16/2008	12:15:00	3	7.00	16.60		9.22							22.97	61.9
6/16/2008	12:15:00	3	8.00	14.80		7.55							26.25	58.6
6/16/2008	12:15:00	3	9.00	13.20		5.88							29.53	55.8
6/16/2008	12:15:00	3	10.00	11.70		4.01							32.81	53.1
6/16/2008	12:15:00	3	11.00	11.10		2.26							36.09	52.0
6/16/2008	12:15:00	3	12.00	10.90		1.58							39.37	51.6
6/16/2008	12:15:00	3	13.00	10.80		0.70							42.65	51.4
<<insert>>														
<b>Min</b>			0.0	10.80		0.70							0.00	51.4
<b>Max</b>			13.0	25.10		9.42							42.65	77.2
<b>Max - Min</b>			13.0	14.30		8.72							42.65	25.7
<b>Count</b>		14	14	14		14							14	14

LWWMD Water Quality Data - 2008  
 ALI Customer No. 1157-03

Insitu Water Quality Data - Lake Wallenpaupack - All Stations  
 Prepared by Aqua Link, Inc.

Database Last Modified: 02/11/11  
 Staff Initials: arl

Insitu Water Quality Data - Station No. 3

Date M/D/Y	Time hh:mm:ss	Site	Depth m	Temp C	DO% %	DO Conc mg/L	Cond uS/cm	SpCond uS/cm	pH s.u.	TDS g/L	Salinity ppt	ORP mV	Conversions	
													Depth (feet)	Temp (Degrees F)
6/24/2008	12:25:00	3	0.00	22.50		8.43							0.00	72.5
6/24/2008	12:25:00	3	1.00	22.50		8.43							3.28	72.5
6/24/2008	12:25:00	3	2.00	22.40		8.30							6.56	72.3
6/24/2008	12:25:00	3	3.00	22.40		7.85							9.84	72.3
6/24/2008	12:25:00	3	4.00	22.30		8.10							13.12	72.1
6/24/2008	12:25:00	3	5.00	20.10		7.97							16.40	68.2
6/24/2008	12:25:00	3	6.00	18.30		8.66							19.68	64.9
6/24/2008	12:25:00	3	7.00	16.10		8.00							22.97	61.0
6/24/2008	12:25:00	3	8.00	15.10		6.26							26.25	59.2
6/24/2008	12:25:00	3	9.00	13.70		4.71							29.53	56.7
6/24/2008	12:25:00	3	10.00	12.80		3.23							32.81	55.0
6/24/2008	12:25:00	3	11.00	7.50		0.66							36.09	45.5
6/24/2008	12:25:00	3	12.00	10.90		0.29							39.37	51.6
6/24/2008	12:25:00	3	13.00	10.90		0.18							42.65	51.6
<<insert>>														
<b>Min</b>			0.0	7.50		0.18							0.00	45.5
<b>Max</b>			13.0	22.50		8.66							42.65	72.5
<b>Max - Min</b>			13.0	15.00		8.48							42.65	27.0
<b>Count</b>		14	14	14		14							14	14

LWWMD Water Quality Data - 2008  
 ALI Customer No. 1157-03

Insitu Water Quality Data - Lake Wallenpaupack - All Stations  
 Prepared by Aqua Link, Inc.

Database Last Modified: 02/11/11  
 Staff Initials: arl

Insitu Water Quality Data - Station No. 3

Date M/D/Y	Time hh:mm:ss	Site	Depth m	Temp C	DO% %	DO Conc mg/L	Cond uS/cm	SpCond uS/cm	pH s.u.	TDS g/L	Salinity ppt	ORP mV	Conversions	
													Depth (feet)	Temp (Degrees F)
7/8/2008	12:00:00	3	0.00	25.40		8.84							0.00	77.7
7/8/2008	12:00:00	3	1.00	25.20		8.77							3.28	77.4
7/8/2008	12:00:00	3	2.00	25.00		8.86							6.56	77.0
7/8/2008	12:00:00	3	3.00	24.70		8.59							9.84	76.5
7/8/2008	12:00:00	3	4.00	24.30		8.28							13.12	75.7
7/8/2008	12:00:00	3	5.00	23.10		8.00							16.40	73.6
7/8/2008	12:00:00	3	6.00	20.50		6.48							19.68	68.9
7/8/2008	12:00:00	3	7.00	17.90		5.40							22.97	64.2
7/8/2008	12:00:00	3	8.00	15.40		5.11							26.25	59.7
7/8/2008	12:00:00	3	9.00	13.40		2.11							29.53	56.1
7/8/2008	12:00:00	3	10.00	12.50		0.82							32.81	54.5
7/8/2008	12:00:00	3	11.00	11.70		0.11							36.09	53.1
7/8/2008	12:00:00	3	12.00	11.50		0.01							39.37	52.7
<<insert>>														
<b>Min</b>			0.0	11.50		0.01							0.00	52.7
<b>Max</b>			12.0	25.40		8.86							39.37	77.7
<b>Max - Min</b>			12.0	13.90		8.85							39.37	25.0
<b>Count</b>		13	13	13		13							13	13

LWWMD Water Quality Data - 2008  
 ALI Customer No. 1157-03

Insitu Water Quality Data - Lake Wallenpaupack - All Stations  
 Prepared by Aqua Link, Inc.

Database Last Modified: 02/11/11  
 Staff Initials: arl

Insitu Water Quality Data - Station No. 3

Date M/D/Y	Time hh:mm:ss	Site	Depth m	Temp C	DO% %	DO Conc mg/L	Cond uS/cm	SpCond uS/cm	pH s.u.	TDS g/L	Salinity ppt	ORP mV	Conversions	
													Depth (feet)	Temp (Degrees F)
7/22/2008	12:20:00	3	0.00	27.50		8.00							0.00	81.5
7/22/2008	12:20:00	3	1.00	26.70		8.31							3.28	80.1
7/22/2008	12:20:00	3	2.00	26.30		8.50							6.56	79.3
7/22/2008	12:20:00	3	3.00	26.00		7.90							9.84	78.8
7/22/2008	12:20:00	3	4.00	25.70		7.77							13.12	78.3
7/22/2008	12:20:00	3	5.00	25.60		7.70							16.40	78.1
7/22/2008	12:20:00	3	6.00	24.00		6.60							19.68	75.2
7/22/2008	12:20:00	3	7.00	20.50		2.90							22.97	68.9
7/22/2008	12:20:00	3	8.00	16.40		0.65							26.25	61.5
7/22/2008	12:20:00	3	9.00	13.60		0.04							29.53	56.5
7/22/2008	12:20:00	3	10.00	12.60		0.00							32.81	54.7
7/22/2008	12:20:00	3	11.00	12.20		0.00							36.09	54.0
7/22/2008	12:20:00	3	12.00	12.10		0.00							39.37	53.8
<<insert>>														
<b>Min</b>			0.0	12.10		0.00							0.00	53.8
<b>Max</b>			12.0	27.50		8.50							39.37	81.5
<b>Max - Min</b>			12.0	15.40		8.50							39.37	27.7
<b>Count</b>		13	13	13		13							13	13

Database Last Modified: 02/11/11  
 Staff Initials: arl

Insitu Water Quality Data - Station No. 3

Date M/D/Y	Time hh:mm:ss	Site	Depth m	Temp C	DO% %	DO Conc mg/L	Cond uS/cm	SpCond uS/cm	pH s.u.	TDS g/L	Salinity ppt	ORP mV	Conversions	
													Depth (feet)	Temp (Degrees F)
8/8/2008	12:20:00	3	0.00	24.10		8.20							0.00	75.4
8/8/2008	12:20:00	3	1.00	24.30		8.50							3.28	75.7
8/8/2008	12:20:00	3	2.00	24.30		8.00							6.56	75.7
8/8/2008	12:20:00	3	3.00	24.20		7.85							9.84	75.6
8/8/2008	12:20:00	3	4.00	23.90		7.20							13.12	75.0
8/8/2008	12:20:00	3	5.00	23.90		7.00							16.40	75.0
8/8/2008	12:20:00	3	6.00	23.80		7.25							19.68	74.8
8/8/2008	12:20:00	3	7.00	21.70		2.10							22.97	71.1
8/8/2008	12:20:00	3	8.00	18.00		0.42							26.25	64.4
8/8/2008	12:20:00	3	9.00	15.30		0.09							29.53	59.5
8/8/2008	12:20:00	3	10.00	14.10		0.04							32.81	57.4
8/8/2008	12:20:00	3	11.00	12.06		0.03							36.09	53.7
<<insert>>														
<b>Min</b>			0.0	12.06		0.03							0.00	53.7
<b>Max</b>			11.0	24.30		8.50							36.09	75.7
<b>Max - Min</b>			11.0	12.24		8.47							36.09	22.0
<b>Count</b>		12	12	12		12							12	12

LWWMD Water Quality Data - 2008  
 ALI Customer No. 1157-03

Insitu Water Quality Data - Lake Wallenpaupack - All Stations  
 Prepared by Aqua Link, Inc.

Database Last Modified: 02/11/11  
 Staff Initials: arl

Insitu Water Quality Data - Station No. 3

Date M/D/Y	Time hh:mm:ss	Site	Depth m	Temp C	DO% %	DO Conc mg/L	Cond uS/cm	SpCond uS/cm	pH s.u.	TDS g/L	Salinity ppt	ORP mV	Conversions	
													Depth (feet)	Temp (Degrees F)
8/25/2008	13:00:00	3	0.00	23.00		7.60							0.00	73.4
8/25/2008	13:00:00	3	1.00	23.20		7.30							3.28	73.8
8/25/2008	13:00:00	3	2.00	23.20		7.35							6.56	73.8
8/25/2008	13:00:00	3	3.00	23.20		7.30							9.84	73.8
8/25/2008	13:00:00	3	4.00	23.10		7.07							13.12	73.6
8/25/2008	13:00:00	3	5.00	23.00		6.88							16.40	73.4
8/25/2008	13:00:00	3	6.00	22.60		4.94							19.68	72.7
8/25/2008	13:00:00	3	7.00	21.00		2.09							22.97	69.8
8/25/2008	13:00:00	3	8.00	19.00		0.05							26.25	66.2
8/25/2008	13:00:00	3	9.00	15.30		0.01							29.53	59.5
8/25/2008	13:00:00	3	10.00	13.40		0.00							32.81	56.1
8/25/2008	13:00:00	3	11.00	12.50		0.00							36.09	54.5
<<insert>>														
<b>Min</b>			0.0	12.50		0.00							0.00	54.5
<b>Max</b>			11.0	23.20		7.60							36.09	73.8
<b>Max - Min</b>			11.0	10.70		7.60							36.09	19.3
<b>Count</b>		12	12	12		12							12	12

LWWMD Water Quality Data - 2008  
 ALI Customer No. 1157-03

Insitu Water Quality Data - Lake Wallenpaupack - All Stations  
 Prepared by Aqua Link, Inc.

Database Last Modified: 02/11/11  
 Staff Initials: arl

Insitu Water Quality Data - Station No. 3

Date M/D/Y	Time hh:mm:ss	Site	Depth m	Temp C	DO% %	DO Conc mg/L	Cond uS/cm	SpCond uS/cm	pH s.u.	TDS g/L	Salinity ppt	ORP mV	Conversions	
													Depth (feet)	Temp (Degrees F)
9/16/2008	12:36:00	3	0.00	21.50		6.94							0.00	70.7
9/16/2008	12:36:00	3	1.00	21.50		6.88							3.28	70.7
9/16/2008	12:36:00	3	2.00	21.20		6.40							6.56	70.2
9/16/2008	12:36:00	3	3.00	21.20		6.13							9.84	70.2
9/16/2008	12:36:00	3	4.00	21.10		5.89							13.12	70.0
9/16/2008	12:36:00	3	5.00	21.10		5.79							16.40	70.0
9/16/2008	12:36:00	3	6.00	21.10		5.90							19.68	70.0
9/16/2008	12:36:00	3	7.00	21.00		5.36							22.97	69.8
9/16/2008	12:36:00	3	8.00	20.40		3.21							26.25	68.7
9/16/2008	12:36:00	3	9.00	16.80		0.10							29.53	62.2
9/16/2008	12:36:00	3	10.00	15.10		0.02							32.81	59.2
<<insert>>														
<b>Min</b>			0.0	15.10		0.02							0.00	59.2
<b>Max</b>			10.0	21.50		6.94							32.81	70.7
<b>Max - Min</b>			10.0	6.40		6.92							32.81	11.5
<b>Count</b>		11	11	11		11							11	11



LWWMD Water Quality Data - 2008  
 ALI Customer No. 1157-03

Insitu Water Quality Data - Lake Wallenpaupack - All Stations  
 Prepared by Aqua Link, Inc.

Database Last Modified: 02/11/11  
 Staff Initials: arl

Insitu Water Quality Data - Station No. 3

Date M/D/Y	Time hh:mm:ss	Site	Depth m	Temp C	DO% %	DO Conc mg/L	Cond uS/cm	SpCond uS/cm	pH s.u.	TDS g/L	Salinity ppt	ORP mV	Conversions	
													Depth (feet)	Temp (Degrees F)
9/29/2008	10:00:00	3	0.00	18.80		6.89							0.00	65.8
9/29/2008	10:00:00	3	1.00	19.00		6.49							3.28	66.2
9/29/2008	10:00:00	3	2.00	19.00		6.49							6.56	66.2
9/29/2008	10:00:00	3	3.00	19.00		6.58							9.84	66.2
9/29/2008	10:00:00	3	4.00	19.00		6.20							13.12	66.2
9/29/2008	10:00:00	3	5.00	19.00		6.44							16.40	66.2
9/29/2008	10:00:00	3	6.00	19.00		6.30							19.68	66.2
9/29/2008	10:00:00	3	7.00	19.00		6.19							22.97	66.2
9/29/2008	10:00:00	3	8.00	19.00		6.08							26.25	66.2
9/29/2008	10:00:00	3	9.00	18.90		3.84							29.53	66.0
9/29/2008	10:00:00	3	10.00	15.60		0.07							32.81	60.1
<<insert>>														
<b>Min</b>			0.0	15.60		0.07							0.00	60.1
<b>Max</b>			10.0	19.00		6.89							32.81	66.2
<b>Max - Min</b>			10.0	3.40		6.82							32.81	6.1
<b>Count</b>		11	11	11		11							11	11

LWWMD Water Quality Data - 2008  
 ALI Customer No. 1157-03

Insitu Water Quality Data - Lake Wallenpaupack - All Stations  
 Prepared by Aqua Link, Inc.

Database Last Modified: 02/11/11  
 Staff Initials: arl

Insitu Water Quality Data - Station No. 3

Date M/D/Y	Time hh:mm:ss	Site	Depth m	Temp C	DO% %	DO Conc mg/L	Cond uS/cm	SpCond uS/cm	pH s.u.	TDS g/L	Salinity ppt	ORP mV	Conversions	
													Depth (feet)	Temp (Degrees F)
10/14/2008	12:30:00	3	0.00	17.40		8.75							0.00	63.3
10/14/2008	12:30:00	3	1.00	17.20		8.08							3.28	63.0
10/14/2008	12:30:00	3	2.00	17.00		8.18							6.56	62.6
10/14/2008	12:30:00	3	3.00	16.50		7.35							9.84	61.7
10/14/2008	12:30:00	3	4.00	16.40		6.89							13.12	61.5
10/14/2008	12:30:00	3	5.00	16.30		6.46							16.40	61.3
10/14/2008	12:30:00	3	6.00	16.30		5.93							19.68	61.3
10/14/2008	12:30:00	3	7.00	16.20		5.20							22.97	61.2
10/14/2008	12:30:00	3	8.00	16.20		5.16							26.25	61.2
10/14/2008	12:30:00	3	9.00	16.10		4.64							29.53	61.0
10/14/2008	12:30:00	3	10.00	16.00		3.75							32.81	60.8
10/14/2008	12:30:00	3	11.00	15.70		0.36							36.09	60.3
<<insert>>														
<b>Min</b>			0.0	15.70		0.36							0.00	60.3
<b>Max</b>			11.0	17.40		8.75							36.09	63.3
<b>Max - Min</b>			11.0	1.70		8.39							36.09	3.1
<b>Count</b>		12	12	12		12							12	12

LWWMD Water Quality Data - 2008  
 ALI Customer No. 1157-03

Insitu Water Quality Data - Lake Wallenpaupack - All Stations  
 Prepared by Aqua Link, Inc.

Database Last Modified: 02/11/11  
 Staff Initials: arl

Insitu Water Quality Data - Station No. 3

Date M/D/Y	Time hh:mm:ss	Site	Depth m	Temp C	DO% %	DO Conc mg/L	Cond uS/cm	SpCond uS/cm	pH s.u.	TDS g/L	Salinity ppt	ORP mV	Conversions	
													Depth (feet)	Temp (Degrees F)
10/30/2008	13:20:00	3	0.00	11.40		9.25							0.00	52.5
10/30/2008	13:20:00	3	1.00	11.50		8.72							3.28	52.7
10/30/2008	13:20:00	3	2.00	11.60		8.60							6.56	52.9
10/30/2008	13:20:00	3	3.00	11.60		8.59							9.84	52.9
10/30/2008	13:20:00	3	4.00	11.50		8.52							13.12	52.7
10/30/2008	13:20:00	3	5.00	11.50		8.43							16.40	52.7
10/30/2008	13:20:00	3	6.00	11.50		8.38							19.68	52.7
10/30/2008	13:20:00	3	7.00	11.50		8.39							22.97	52.7
10/30/2008	13:20:00	3	8.00	11.50		8.29							26.25	52.7
10/30/2008	13:20:00	3	9.00	11.50		8.27							29.53	52.7
10/30/2008	13:20:00	3	10.00	11.50		8.26							32.81	52.7
10/30/2008	13:20:00	3	11.00	11.50		8.25							36.09	52.7
<<insert>>														
<b>Min</b>			0.0	11.40		8.25							0.00	52.5
<b>Max</b>			11.0	11.60		9.25							36.09	52.9
<b>Max - Min</b>			11.0	0.20		1.00							36.09	0.4
<b>Count</b>		12	12	12		12							12	12

LWWMD Water Quality Data - 2008  
 ALI Customer No. 1157-03

Insitu Water Quality Data - Lake Wallenpaupack - All Stations  
 Prepared by Aqua Link, Inc.

Database Last Modified: 02/11/11  
 Staff Initials: arl

Insitu Water Quality Data - Station No. 3

Date M/D/Y	Time hh:mm:ss	Site	Depth m	Temp C	DO% %	DO Conc mg/L	Cond uS/cm	SpCond uS/cm	pH s.u.	TDS g/L	Salinity ppt	ORP mV	Conversions	
													Depth (feet)	Temp (Degrees F)
11/21/2008	9:47:00	3	0.00	7.40		10.31							0.00	45.3
11/21/2008	9:47:00	3	1.00	7.40		9.85							3.28	45.3
11/21/2008	9:47:00	3	2.00	7.60		9.86							6.56	45.7
11/21/2008	9:47:00	3	3.00	7.60		9.75							9.84	45.7
11/21/2008	9:47:00	3	4.00	7.60		9.78							13.12	45.7
11/21/2008	9:47:00	3	5.00	7.60		9.80							16.40	45.7
11/21/2008	9:47:00	3	6.00	7.60		9.60							19.68	45.7
11/21/2008	9:47:00	3	7.00	7.60		9.63							22.97	45.7
11/21/2008	9:47:00	3	8.00	7.60		9.65							26.25	45.7
11/21/2008	9:47:00	3	9.00	7.50		9.67							29.53	45.5
11/21/2008	9:47:00	3	10.00	7.60		9.66							32.81	45.7
11/21/2008	9:47:00	3	11.00	7.50		9.58							36.09	45.5
11/21/2008	9:47:00	3	12.00	7.50		3.80							39.37	45.5
<<insert>>														
<b>Min</b>			0.0	7.40		3.80							0.00	45.3
<b>Max</b>			12.0	7.60		10.31							39.37	45.7
<b>Max - Min</b>			12.0	0.20		6.51							39.37	0.4
<b>Count</b>		13	13	13		13							13	13

LWWMD Water Quality Data - 2008  
 ALI Customer No. 1157-03

Insitu Water Quality Data - Lake Wallenpaupack - All Stations  
 Prepared by Aqua Link, Inc.

Database Last Modified: 02/11/11  
 Staff Initials: arl

Insitu Water Quality Data - Station No. 5

Date M/D/Y	Time hh:mm:ss	Site	Depth m	Temp C	DO% %	DO Conc mg/L	Cond uS/cm	SpCond uS/cm	pH s.u.	TDS g/L	Salinity ppt	ORP mV	Conversions	
													Depth (feet)	Temp (Degrees F)
5/20/2008		5	0.00										0.00	
5/20/2008		5	1.00	12.30		9.00							3.28	54.1
5/20/2008		5	2.00	12.20		9.00							6.56	54.0
5/20/2008		5	3.00	12.00		8.60							9.84	53.6
5/20/2008		5	4.00	11.90		7.90							13.12	53.4
5/20/2008		5	5.00	11.80		8.90							16.40	53.2
5/20/2008		5	6.00	11.80		8.90							19.68	53.2
<<insert>>														
<b>Min</b>			0.0	11.80		7.90							0.00	53.2
<b>Max</b>			6.0	12.30		9.00							19.68	54.1
<b>Max - Min</b>			6.0	0.50		1.10							19.68	0.9
<b>Count</b>		7	7	6		6							7	6

LWWMD Water Quality Data - 2008  
 ALI Customer No. 1157-03

Insitu Water Quality Data - Lake Wallenpaupack - All Stations  
 Prepared by Aqua Link, Inc.

Database Last Modified: 02/11/11  
 Staff Initials: arl

Insitu Water Quality Data - Station No. 5

Date M/D/Y	Time hh:mm:ss	Site	Depth m	Temp C	DO% %	DO Conc mg/L	Cond uS/cm	SpCond uS/cm	pH s.u.	TDS g/L	Salinity ppt	ORP mV	Conversions	
													Depth (feet)	Temp (Degrees F)
5/28/2008	14:00:00	5	0.00	16.00		9.44							0.00	60.8
5/28/2008	14:00:00	5	1.00	15.70		9.24							3.28	60.3
5/28/2008	14:00:00	5	2.00	15.60		9.86							6.56	60.1
5/28/2008	14:00:00	5	3.00	14.90		9.64							9.84	58.8
5/28/2008	14:00:00	5	4.00	13.00		9.62							13.12	55.4
5/28/2008	14:00:00	5	5.00	12.70		8.66							16.40	54.9
5/28/2008	14:00:00	5	6.00	12.00		7.20							19.68	53.6
<<insert>>														
<b>Min</b>			0.0	12.00		7.20							0.00	53.6
<b>Max</b>			6.0	16.00		9.86							19.68	60.8
<b>Max - Min</b>			6.0	4.00		2.66							19.68	7.2
<b>Count</b>		7	7	7		7							7	7

LWWMD Water Quality Data - 2008  
 ALI Customer No. 1157-03

Insitu Water Quality Data - Lake Wallenpaupack - All Stations  
 Prepared by Aqua Link, Inc.

Database Last Modified: 02/11/11  
 Staff Initials: arl

Insitu Water Quality Data - Station No. 5

Date M/D/Y	Time hh:mm:ss	Site	Depth m	Temp C	DO% %	DO Conc mg/L	Cond uS/cm	SpCond uS/cm	pH s.u.	TDS g/L	Salinity ppt	ORP mV	Conversions	
													Depth (feet)	Temp (Degrees F)
6/16/2008	13:15:00	5	0.00	25.60		8.29							0.00	78.1
6/16/2008	13:15:00	5	1.00	25.10		8.72							3.28	77.2
6/16/2008	13:15:00	5	2.00	24.60		8.40							6.56	76.3
6/16/2008	13:15:00	5	3.00	24.20		7.38							9.84	75.6
6/16/2008	13:15:00	5	4.00	22.50		6.13							13.12	72.5
6/16/2008	13:15:00	5	5.00	20.00		5.88							16.40	68.0
6/16/2008	13:15:00	5	6.00	17.70		5.36							19.68	63.9
6/16/2008	13:15:00	5	7.00	17.50		5.80							22.97	63.5
<<insert>>														
<b>Min</b>			0.0	17.50		5.36							0.00	63.5
<b>Max</b>			7.0	25.60		8.72							22.97	78.1
<b>Max - Min</b>			7.0	8.10		3.36							22.97	14.6
<b>Count</b>		8	8	8		8							8	8

LWWMD Water Quality Data - 2008  
 ALI Customer No. 1157-03

Insitu Water Quality Data - Lake Wallenpaupack - All Stations  
 Prepared by Aqua Link, Inc.

Database Last Modified: 02/11/11  
 Staff Initials: arl

Insitu Water Quality Data - Station No. 5

Date M/D/Y	Time hh:mm:ss	Site	Depth m	Temp C	DO% %	DO Conc mg/L	Cond uS/cm	SpCond uS/cm	pH s.u.	TDS g/L	Salinity ppt	ORP mV	Conversions	
													Depth (feet)	Temp (Degrees F)
6/24/2008	13:30:00	5	0.00	22.70		8.59							0.00	72.9
6/24/2008	13:30:00	5	1.00	22.70		8.55							3.28	72.9
6/24/2008	13:30:00	5	2.00	22.60		8.15							6.56	72.7
6/24/2008	13:30:00	5	3.00	21.60		7.13							9.84	70.9
6/24/2008	13:30:00	5	4.00	20.70		6.45							13.12	69.3
6/24/2008	13:30:00	5	5.00	20.00		6.25							16.40	68.0
6/24/2008	13:30:00	5	6.00	18.70		5.17							19.68	65.7
6/24/2008	13:30:00	5	7.00	17.00		2.45							22.97	62.6
<<insert>>														
<b>Min</b>			0.0	17.00		2.45							0.00	62.6
<b>Max</b>			7.0	22.70		8.59							22.97	72.9
<b>Max - Min</b>			7.0	5.70		6.14							22.97	10.3
<b>Count</b>		8	8	8		8							8	8



LWWMD Water Quality Data - 2008  
 ALI Customer No. 1157-03

Insitu Water Quality Data - Lake Wallenpaupack - All Stations  
 Prepared by Aqua Link, Inc.

Database Last Modified: 02/11/11  
 Staff Initials: arl

Insitu Water Quality Data - Station No. 5

Date M/D/Y	Time hh:mm:ss	Site	Depth m	Temp C	DO% %	DO Conc mg/L	Cond uS/cm	SpCond uS/cm	pH s.u.	TDS g/L	Salinity ppt	ORP mV	Conversions	
													Depth (feet)	Temp (Degrees F)
7/8/2008	14:08:00	5	0.00	25.50		8.77							0.00	77.9
7/8/2008	14:08:00	5	1.00	25.30		8.82			7.70				3.28	77.5
7/8/2008	14:08:00	5	2.00	25.10		9.02							6.56	77.2
7/8/2008	14:08:00	5	3.00	24.40		9.16							9.84	75.9
7/8/2008	14:08:00	5	4.00	24.00		8.43							13.12	75.2
7/8/2008	14:08:00	5	5.00	23.30		7.35							16.40	73.9
7/8/2008	14:08:00	5	6.00	22.00		5.57							19.68	71.6
7/8/2008	14:08:00	5	7.00	19.40		1.85			6.90				22.97	66.9
<<insert>>														
<b>Min</b>			0.0	19.40		1.85			6.90				0.00	66.9
<b>Max</b>			7.0	25.50		9.16			7.70				22.97	77.9
<b>Max - Min</b>			7.0	6.10		7.31			0.80				22.97	11.0
<b>Count</b>		8	8	8		8			2				8	8

LWWMD Water Quality Data - 2008  
 ALI Customer No. 1157-03

Insitu Water Quality Data - Lake Wallenpaupack - All Stations  
 Prepared by Aqua Link, Inc.

Database Last Modified: 02/11/11  
 Staff Initials: arl

Insitu Water Quality Data - Station No. 5

Date M/D/Y	Time hh:mm:ss	Site	Depth m	Temp C	DO% %	DO Conc mg/L	Cond uS/cm	SpCond uS/cm	pH s.u.	TDS g/L	Salinity ppt	ORP mV	Conversions	
													Depth (feet)	Temp (Degrees F)
7/22/2008	13:15:00	5	0.00	26.40		8.60							0.00	79.5
7/22/2008	13:15:00	5	1.00	26.10		8.53							3.28	79.0
7/22/2008	13:15:00	5	2.00	25.60		8.50							6.56	78.1
7/22/2008	13:15:00	5	3.00	25.10		7.30							9.84	77.2
7/22/2008	13:15:00	5	4.00	24.50		5.34							13.12	76.1
7/22/2008	13:15:00	5	5.00	24.10		2.63							16.40	75.4
<<insert>>														
<b>Min</b>			0.0	24.10		2.63							0.00	75.4
<b>Max</b>			5.0	26.40		8.60							16.40	79.5
<b>Max - Min</b>			5.0	2.30		5.97							16.40	4.1
<b>Count</b>		6	6	6		6							6	6

LWWMD Water Quality Data - 2008  
 ALI Customer No. 1157-03

Insitu Water Quality Data - Lake Wallenpaupack - All Stations  
 Prepared by Aqua Link, Inc.

Database Last Modified: 02/11/11  
 Staff Initials: arl

Insitu Water Quality Data - Station No. 5

Date M/D/Y	Time hh:mm:ss	Site	Depth m	Temp C	DO% %	DO Conc mg/L	Cond uS/cm	SpCond uS/cm	pH s.u.	TDS g/L	Salinity ppt	ORP mV	Conversions		
													Depth (feet)	Temp (Degrees F)	
8/8/2008	14:10:00	5	0.00	23.80		7.95							0.00	74.8	
8/8/2008	14:10:00	5	1.00	24.00		8.00							3.28	75.2	
8/8/2008	14:10:00	5	2.00	24.00		7.55							6.56	75.2	
8/8/2008	14:10:00	5	3.00	23.90		6.40							9.84	75.0	
8/8/2008	14:10:00	5	4.00	23.70		3.76							13.12	74.7	
8/8/2008	14:10:00	5	5.00	23.20		3.80							16.40	73.8	
<<insert>>															
				<b>Min</b>		0.0	23.20							0.00	73.8
				<b>Max</b>		5.0	24.00							16.40	75.2
				<b>Max - Min</b>		5.0	0.80							16.40	1.4
				<b>Count</b>	6	6	6							6	6

LWWMD Water Quality Data - 2008  
 ALI Customer No. 1157-03

Insitu Water Quality Data - Lake Wallenpaupack - All Stations  
 Prepared by Aqua Link, Inc.

Database Last Modified: 02/11/11  
 Staff Initials: arl

Insitu Water Quality Data - Station No. 5

Date M/D/Y	Time hh:mm:ss	Site	Depth m	Temp C	DO% %	DO Conc mg/L	Cond uS/cm	SpCond uS/cm	pH s.u.	TDS g/L	Salinity ppt	ORP mV	Conversions		
													Depth (feet)	Temp (Degrees F)	
8/25/2008	14:00:00	5	0.00	23.00		7.22							0.00	73.4	
8/25/2008	14:00:00	5	1.00	23.10		7.00							3.28	73.6	
8/25/2008	14:00:00	5	2.00	22.80		5.33							6.56	73.0	
8/25/2008	14:00:00	5	3.00	22.30		4.44							9.84	72.1	
8/25/2008	14:00:00	5	4.00	22.00		3.70							13.12	71.6	
8/25/2008	14:00:00	5	5.00	21.80		3.39							16.40	71.2	
<<insert>>															
				<b>Min</b>		0.0	21.80						3.39	0.00	71.2
				<b>Max</b>		5.0	23.10						7.22	16.40	73.6
				<b>Max - Min</b>		5.0	1.30						3.83	16.40	2.3
				<b>Count</b>	6	6	6						6	6	

LWWMD Water Quality Data - 2008  
 ALI Customer No. 1157-03

Insitu Water Quality Data - Lake Wallenpaupack - All Stations  
 Prepared by Aqua Link, Inc.

Database Last Modified: 02/11/11  
 Staff Initials: arl

Insitu Water Quality Data - Station No. 5

Date M/D/Y	Time hh:mm:ss	Site	Depth m	Temp C	DO% %	DO Conc mg/L	Cond uS/cm	SpCond uS/cm	pH s.u.	TDS g/L	Salinity ppt	ORP mV	Conversions	
													Depth (feet)	Temp (Degrees F)
9/16/2008	13:25:00	5	0.00	21.40		7.15							0.00	70.5
9/16/2008	13:25:00	5	1.00	21.50		6.75							3.28	70.7
9/16/2008	13:25:00	5	2.00	21.10		5.67							6.56	70.0
9/16/2008	13:25:00	5	3.00	20.90		5.40							9.84	69.6
9/16/2008	13:25:00	5	4.00	20.80		4.84							13.12	69.4
9/16/2008	13:25:00	5	5.00	20.50		2.48							16.40	68.9
<<insert>>														
			<b>Min</b>	0.0	20.50	2.48							0.00	68.9
			<b>Max</b>	5.0	21.50	7.15							16.40	70.7
			<b>Max - Min</b>	5.0	1.00	4.67							16.40	1.8
			<b>Count</b>	6	6	6							6	6

LWWMD Water Quality Data - 2008  
 ALI Customer No. 1157-03

Insitu Water Quality Data - Lake Wallenpaupack - All Stations  
 Prepared by Aqua Link, Inc.

Database Last Modified: 02/11/11  
 Staff Initials: arl

Insitu Water Quality Data - Station No. 5

Date M/D/Y	Time hh:mm:ss	Site	Depth m	Temp C	DO% %	DO Conc mg/L	Cond uS/cm	SpCond uS/cm	pH s.u.	TDS g/L	Salinity ppt	ORP mV	Conversions	
													Depth (feet)	Temp (Degrees F)
9/29/2008	10:50:00	5	0.00	18.70		6.58							0.00	65.7
9/29/2008	10:50:00	5	1.00	18.90		6.27							3.28	66.0
9/29/2008	10:50:00	5	2.00	18.90		5.84							6.56	66.0
9/29/2008	10:50:00	5	3.00	18.90		6.16							9.84	66.0
9/29/2008	10:50:00	5	4.00	18.50		6.11							13.12	65.3
<<insert>>														
<b>Min</b>			0.0	18.50		5.84							0.00	65.3
<b>Max</b>			4.0	18.90		6.58							13.12	66.0
<b>Max - Min</b>			4.0	0.40		0.74							13.12	0.7
<b>Count</b>		5	5	5		5							5	5

LWWMD Water Quality Data - 2008  
 ALI Customer No. 1157-03

Insitu Water Quality Data - Lake Wallenpaupack - All Stations  
 Prepared by Aqua Link, Inc.

Database Last Modified: 02/11/11  
 Staff Initials: arl

Insitu Water Quality Data - Station No. 5

Date M/D/Y	Time hh:mm:ss	Site	Depth m	Temp C	DO% %	DO Conc mg/L	Cond uS/cm	SpCond uS/cm	pH s.u.	TDS g/L	Salinity ppt	ORP mV	Conversions	
													Depth (feet)	Temp (Degrees F)
10/14/2008	13:15:00	5	0.00	17.00		9.72							0.00	62.6
10/14/2008	13:15:00	5	1.00	16.60		9.76							3.28	61.9
10/14/2008	13:15:00	5	2.00	16.40		8.31							6.56	61.5
10/14/2008	13:15:00	5	3.00	15.90		9.07							9.84	60.6
10/14/2008	13:15:00	5	4.00	15.80		8.94							13.12	60.4
10/14/2008	13:15:00	5	5.00	15.70		7.01							16.40	60.3
<<insert>>														
			<b>Min</b>	0.0	15.70	7.01							0.00	60.3
			<b>Max</b>	5.0	17.00	9.76							16.40	62.6
			<b>Max - Min</b>	5.0	1.30	2.75							16.40	2.3
			<b>Count</b>	6	6	6							6	6

LWWMD Water Quality Data - 2008  
 ALI Customer No. 1157-03

Insitu Water Quality Data - Lake Wallenpaupack - All Stations  
 Prepared by Aqua Link, Inc.

Database Last Modified: 02/11/11  
 Staff Initials: arl

Insitu Water Quality Data - Station No. 5

Date M/D/Y	Time hh:mm:ss	Site	Depth m	Temp C	DO% %	DO Conc mg/L	Cond uS/cm	SpCond uS/cm	pH s.u.	TDS g/L	Salinity ppt	ORP mV	Conversions		
													Depth (feet)	Temp (Degrees F)	
10/30/2008	14:00:00	5	0.00	5.30		14.14							0.00	41.5	
10/30/2008	14:00:00	5	1.00	5.30		12.42							3.28	41.5	
10/30/2008	14:00:00	5	2.00	5.30		11.91							6.56	41.5	
10/30/2008	14:00:00	5	3.00	5.20		11.80							9.84	41.4	
10/30/2008	14:00:00	5	4.00	5.10		11.69							13.12	41.2	
10/30/2008	14:00:00	5	5.00	5.10		11.77							16.40	41.2	
<<insert>>															
				<b>Min</b>		0.0	5.10							0.00	41.2
				<b>Max</b>		5.0	5.30							16.40	41.5
				<b>Max - Min</b>		5.0	0.20							16.40	0.4
				<b>Count</b>	6	6	6							6	6



LWWMD Water Quality Data - 2009  
 ALI Customer No. 1157-03

Insitu Water Quality Data - Lake Wallenpaupack - All Stations  
 Prepared by Aqua Link, Inc.

Database Last Modified: 02/11/11  
 Staff Initials: arl

Insitu Water Quality Data - Station No. 3

Date M/D/Y	Time hh:mm:ss	Site	Depth m	Temp C	DO% %	DO Conc mg/L	Cond uS/cm	SpCond uS/cm	pH s.u.	TDS g/L	Salinity ppt	ORP mV	Conversions	
													Depth (feet)	Temp (Degrees F)
3/26/2009	11:50:00	3	0.00	5.1		12.45			7.12				0.00	41.2
3/26/2009	11:50:00	3	1.00	4.7		12.56							3.28	40.5
3/26/2009	11:50:00	3	2.00	4.6		12.5							6.56	40.3
3/26/2009	11:50:00	3	3.00	4.5		12.46							9.84	40.1
3/26/2009	11:50:00	3	4.00	4.4		12.38							13.12	39.9
3/26/2009	11:50:00	3	5.00	4.4		12.56							16.40	39.9
3/26/2009	11:50:00	3	6.00	4.4		12.54							19.68	39.9
3/26/2009	11:50:00	3	7.00	4.3		12.48							22.97	39.7
3/26/2009	11:50:00	3	8.00	4.3		12.48							26.25	39.7
3/26/2009	11:50:00	3	9.00	4.3		12.5							29.53	39.7
3/26/2009	11:50:00	3	10.00	4.3		12.36							32.81	39.7
3/26/2009	11:50:00	3	11.00	4.3		12.38			6.93				36.09	39.7
<<insert>>														
<b>Min</b>		3.0	0.0	4.30	0.0	12.36	0	0	6.93	0.00	0.00	0	0.00	39.7
<b>Max</b>		3.0	11.0	5.10	0.0	12.56	0	0	7.12	0.00	0.00	0	36.09	41.2
<b>Max - Min</b>		0.0	11.0	0.80	0.0	0.20	0	0	0.19	0.00	0.00	0	36.09	1.4
<b>Count</b>		12	12	12	0	12	0	0	2	0	0	0	12	12

LWWMD Water Quality Data - 2009  
 ALI Customer No. 1157-03

Insitu Water Quality Data - Lake Wallenpaupack - All Stations  
 Prepared by Aqua Link, Inc.

Database Last Modified: 02/11/11  
 Staff Initials: arl

Insitu Water Quality Data - Station No. 3

Date M/D/Y	Time hh:mm:ss	Site	Depth m	Temp C	DO% %	DO Conc mg/L	Cond uS/cm	SpCond uS/cm	pH s.u.	TDS g/L	Salinity ppt	ORP mV	Conversions	
													Depth (feet)	Temp (Degrees F)
4/21/2009		3	0.00	9		11.13			7.67				0.00	48.2
4/21/2009		3	1.00	8.7		11.3							3.28	47.7
4/21/2009		3	2.00	8.1		11.3							6.56	46.6
4/21/2009		3	3.00	7.9		10.96							9.84	46.2
4/21/2009		3	4.00	7.7		11.1							13.12	45.9
4/21/2009		3	5.00	7.6		11.1							16.40	45.7
4/21/2009		3	6.00	7.6		11.11							19.68	45.7
4/21/2009		3	7.00	7.5		10.97							22.97	45.5
4/21/2009		3	8.00	7.4		10.93							26.25	45.3
4/21/2009		3	9.00	7.3		10.98							29.53	45.1
4/21/2009		3	10.00	7.3		11.04							32.81	45.1
4/21/2009		3	11.00	7.3		10.95							36.09	45.1
4/21/2009		3	12.00	7.1		10.24							39.37	44.8
<<insert>>														
<b>Min</b>		3.0	0.0	7.10	0.0	10.24	0	0	7.67	0.00	0.00	0	0.00	44.8
<b>Max</b>		3.0	12.0	9.00	0.0	11.30	0	0	7.67	0.00	0.00	0	39.37	48.2
<b>Max - Min</b>		0.0	12.0	1.90	0.0	1.06	0	0	0.00	0.00	0.00	0	39.37	3.4
<b>Count</b>		13	13	13	0	13	0	0	1	0	0	0	13	13

LWWMD Water Quality Data - 2009  
 ALI Customer No. 1157-03

Insitu Water Quality Data - Lake Wallenpaupack - All Stations  
 Prepared by Aqua Link, Inc.

Database Last Modified: 02/11/11  
 Staff Initials: arl

Insitu Water Quality Data - Station No. 3

Date M/D/Y	Time hh:mm:ss	Site	Depth m	Temp C	DO% %	DO Conc mg/L	Cond uS/cm	SpCond uS/cm	pH s.u.	TDS g/L	Salinity ppt	ORP mV	Conversions	
													Depth (feet)	Temp (Degrees F)
5/13/2009		3	0.00	14.5		10.47			8.92				0.00	58.1
5/13/2009		3	1.00	14.4		10.29							3.28	57.9
5/13/2009		3	2.00	14.2		10.16							6.56	57.6
5/13/2009		3	3.00	14.1		10.16							9.84	57.4
5/13/2009		3	4.00	14		10.36							13.12	57.2
5/13/2009		3	5.00	13.2		10.22							16.40	55.8
5/13/2009		3	6.00	13.1		10.14							19.68	55.6
5/13/2009		3	7.00	12.9		9.82							22.97	55.2
5/13/2009		3	8.00	12.7		9.77							26.25	54.9
5/13/2009		3	9.00	11.7		9.12							29.53	53.1
5/13/2009		3	10.00	11.1		8.68							32.81	52.0
5/13/2009		3	11.00	10.4		7.9							36.09	50.7
5/13/2009		3	12.00	9.4		6.7							39.37	48.9
5/13/2009		3	13.00	9.3		6.43							42.65	48.7
<<insert>>														
<b>Min</b>		3.0	0.0	9.30	0.0	6.43	0	0	8.92	0.00	0.00	0	0.00	48.7
<b>Max</b>		3.0	13.0	14.50	0.0	10.47	0	0	8.92	0.00	0.00	0	42.65	58.1
<b>Max - Min</b>		0.0	13.0	5.20	0.0	4.04	0	0	0.00	0.00	0.00	0	42.65	9.4
<b>Count</b>		14	14	14	0	14	0	0	1	0	0	0	14	14

LWWMD Water Quality Data - 2009  
 ALI Customer No. 1157-03

Insitu Water Quality Data - Lake Wallenpaupack - All Stations  
 Prepared by Aqua Link, Inc.

Database Last Modified: 02/11/11  
 Staff Initials: arl

Insitu Water Quality Data - Station No. 3

Date M/D/Y	Time hh:mm:ss	Site	Depth m	Temp C	DO% %	DO Conc mg/L	Cond uS/cm	SpCond uS/cm	pH s.u.	TDS g/L	Salinity ppt	ORP mV	Conversions	
													Depth (feet)	Temp (Degrees F)
5/26/2009	12:20:00	3	0.00	17.3		9.66			8.33				0.00	63.1
5/26/2009	12:20:00	3	1.00	17.3		9.4							3.28	63.1
5/26/2009	12:20:00	3	2.00	17.3		9.5							6.56	63.1
5/26/2009	12:20:00	3	3.00	17.2		9.55							9.84	63.0
5/26/2009	12:20:00	3	4.00	17.2		9.27							13.12	63.0
5/26/2009	12:20:00	3	5.00	17.1		9.33							16.40	62.8
5/26/2009	12:20:00	3	6.00	17		9.43							19.68	62.6
5/26/2009	12:20:00	3	7.00	17		9.43							22.97	62.6
5/26/2009	12:20:00	3	8.00	13.8		8.68							26.25	56.8
5/26/2009	12:20:00	3	9.00	13.4		8.41							29.53	56.1
5/26/2009	12:20:00	3	10.00	12.7		6.71							32.81	54.9
5/26/2009	12:20:00	3	11.00	11.4		4.98							36.09	52.5
5/26/2009	12:20:00	3	12.00	11.1		3.61							39.37	52.0
5/26/2009	12:20:00	3	13.00	10.5		3.32							42.65	50.9
<<insert>>														
<b>Min</b>		3.0	0.0	10.50	0.0	3.32	0	0	8.33	0.00	0.00	0	0.00	50.9
<b>Max</b>		3.0	13.0	17.30	0.0	9.66	0	0	8.33	0.00	0.00	0	42.65	63.1
<b>Max - Min</b>		0.0	13.0	6.80	0.0	6.34	0	0	0.00	0.00	0.00	0	42.65	12.2
<b>Count</b>		14	14	14	0	14	0	0	1	0	0	0	14	14

LWWMD Water Quality Data - 2009  
 ALI Customer No. 1157-03

Insitu Water Quality Data - Lake Wallenpaupack - All Stations  
 Prepared by Aqua Link, Inc.

Database Last Modified: 02/11/11  
 Staff Initials: arl

Insitu Water Quality Data - Station No. 3

Date M/D/Y	Time hh:mm:ss	Site	Depth m	Temp C	DO% %	DO Conc mg/L	Cond uS/cm	SpCond uS/cm	pH s.u.	TDS g/L	Salinity ppt	ORP mV	Conversions	
													Depth (feet)	Temp (Degrees F)
6/9/2009	13:58:00	3	0.00	20.9		8.3			7.92				0.00	69.6
6/9/2009	13:58:00	3	1.00	20.9		8.17							3.28	69.6
6/9/2009	13:58:00	3	2.00	19.9		8.3							6.56	67.8
6/9/2009	13:58:00	3	3.00	19.6		8.33							9.84	67.3
6/9/2009	13:58:00	3	4.00	19.4		8.41							13.12	66.9
6/9/2009	13:58:00	3	5.00	18.4		8.2							16.40	65.1
6/9/2009	13:58:00	3	6.00	17.5		7.97							19.68	63.5
6/9/2009	13:58:00	3	7.00	16.9		7.6							22.97	62.4
6/9/2009	13:58:00	3	8.00	14.2		5.65							26.25	57.6
6/9/2009	13:58:00	3	9.00	13.1		4.71							29.53	55.6
6/9/2009	13:58:00	3	10.00	12		2.9							32.81	53.6
6/9/2009	13:58:00	3	11.00	11.3		1.51							36.09	52.3
6/9/2009	13:58:00	3	12.00	11.1		1.35							39.37	52.0
6/9/2009	13:58:00	3	13.00	11		1.29							42.65	51.8
<<insert>>														
<b>Min</b>		3.0	0.0	11.00	0.0	1.29	0	0	7.92	0.00	0.00	0	0.00	51.8
<b>Max</b>		3.0	13.0	20.90	0.0	8.41	0	0	7.92	0.00	0.00	0	42.65	69.6
<b>Max - Min</b>		0.0	13.0	9.90	0.0	7.12	0	0	0.00	0.00	0.00	0	42.65	17.8
<b>Count</b>		14	14	14	0	14	0	0	1	0	0	0	14	14

LWWMD Water Quality Data - 2009  
 ALI Customer No. 1157-03

Insitu Water Quality Data - Lake Wallenpaupack - All Stations  
 Prepared by Aqua Link, Inc.

Database Last Modified: 02/11/11  
 Staff Initials: arl

Insitu Water Quality Data - Station No. 3

Date M/D/Y	Time hh:mm:ss	Site	Depth m	Temp C	DO% %	DO Conc mg/L	Cond uS/cm	SpCond uS/cm	pH s.u.	TDS g/L	Salinity ppt	ORP mV	Conversions	
													Depth (feet)	Temp (Degrees F)
6/23/2009	15:25:00	3	0.00	21.4		8.4			8.22				0.00	70.5
6/23/2009	15:25:00	3	1.00	21		8.47							3.28	69.8
6/23/2009	15:25:00	3	2.00	20.9		8.55							6.56	69.6
6/23/2009	15:25:00	3	3.00	20.9		8.51							9.84	69.6
6/23/2009	15:25:00	3	4.00	20.8		8.34							13.12	69.4
6/23/2009	15:25:00	3	5.00	20.5		8.03							16.40	68.9
6/23/2009	15:25:00	3	6.00	19.6		7.35							19.68	67.3
6/23/2009	15:25:00	3	7.00	16.5		4.55							22.97	61.7
6/23/2009	15:25:00	3	8.00	15.5		3.85							26.25	59.9
6/23/2009	15:25:00	3	9.00	14.8		3.39							29.53	58.6
6/23/2009	15:25:00	3	10.00	13.3		2.15							32.81	55.9
6/23/2009	15:25:00	3	11.00	11.9		0.49							36.09	53.4
6/23/2009	15:25:00	3	12.00	11.5		0.12							39.37	52.7
6/23/2009	15:25:00	3	13.00	11.5		0.08							42.65	52.7
6/23/2009	15:25:00	3	14.00	11.3		0							45.93	52.3
6/23/2009	15:25:00	3	15.00	11.3		0							49.21	52.3
6/23/2009	15:25:00	3	16.00	11.4		0							52.49	52.5
<<insert>>														
<b>Min</b>		3.0	0.0	11.30	0.0	0.00	0	0	8.22	0.00	0.00	0	0.00	52.3
<b>Max</b>		3.0	16.0	21.40	0.0	8.55	0	0	8.22	0.00	0.00	0	52.49	70.5
<b>Max - Min</b>		0.0	16.0	10.10	0.0	8.55	0	0	0.00	0.00	0.00	0	52.49	18.2
<b>Count</b>		17	17	17	0	17	0	0	1	0	0	0	17	17

LWWMD Water Quality Data - 2009  
 ALI Customer No. 1157-03

Insitu Water Quality Data - Lake Wallenpaupack - All Stations  
 Prepared by Aqua Link, Inc.

Database Last Modified: 02/11/11  
 Staff Initials: arl

Insitu Water Quality Data - Station No. 3

Date M/D/Y	Time hh:mm:ss	Site	Depth m	Temp C	DO% %	DO Conc mg/L	Cond uS/cm	SpCond uS/cm	pH s.u.	TDS g/L	Salinity ppt	ORP mV	Conversions	
													Depth (feet)	Temp (Degrees F)
7/9/2009	13:50:00	3	0.00	23.8		7.93			7.1				0.00	74.8
7/9/2009	13:50:00	3	1.00	23.1		8.2							3.28	73.6
7/9/2009	13:50:00	3	2.00	22.2		8.5							6.56	72.0
7/9/2009	13:50:00	3	3.00	21.8		8.2							9.84	71.2
7/9/2009	13:50:00	3	4.00	21.6		8							13.12	70.9
7/9/2009	13:50:00	3	5.00	21.5		7.97							16.40	70.7
7/9/2009	13:50:00	3	6.00	21.4		6.7							19.68	70.5
7/9/2009	13:50:00	3	7.00	19.4		3.99							22.97	66.9
7/9/2009	13:50:00	3	8.00	17.3		2.47							26.25	63.1
7/9/2009	13:50:00	3	9.00	14.8		1.12							29.53	58.6
7/9/2009	13:50:00	3	10.00	13.2		0.22							32.81	55.8
7/9/2009	13:50:00	3	11.00	12.1		0							36.09	53.8
7/9/2009	13:50:00	3	12.00	11.8		0							39.37	53.2
7/9/2009	13:50:00	3	13.00	11.6		0							42.65	52.9
<<insert>>														
<b>Min</b>		3.0	0.0	11.60	0.0	0.00	0	0	7.10	0.00	0.00	0	0.00	52.9
<b>Max</b>		3.0	13.0	23.80	0.0	8.50	0	0	7.10	0.00	0.00	0	42.65	74.8
<b>Max - Min</b>		0.0	13.0	12.20	0.0	8.50	0	0	0.00	0.00	0.00	0	42.65	22.0
<b>Count</b>		14	14	14	0	14	0	0	1	0	0	0	14	14

LWWMD Water Quality Data - 2009  
 ALI Customer No. 1157-03

Insitu Water Quality Data - Lake Wallenpaupack - All Stations  
 Prepared by Aqua Link, Inc.

Database Last Modified: 02/11/11  
 Staff Initials: arl

Insitu Water Quality Data - Station No. 3

Date M/D/Y	Time hh:mm:ss	Site	Depth m	Temp C	DO% %	DO Conc mg/L	Cond uS/cm	SpCond uS/cm	pH s.u.	TDS g/L	Salinity ppt	ORP mV	Conversions	
													Depth (feet)	Temp (Degrees F)
7/30/2009	14:50:00	3	0.00	24.5		7.73			7.9				0.00	76.1
7/30/2009	14:50:00	3	1.00	24.3		7.65							3.28	75.7
7/30/2009	14:50:00	3	2.00	24.2		7.65							6.56	75.6
7/30/2009	14:50:00	3	3.00	23.8		7.48							9.84	74.8
7/30/2009	14:50:00	3	4.00	23.7		7.4							13.12	74.7
7/30/2009	14:50:00	3	5.00	23.5		7.2							16.40	74.3
7/30/2009	14:50:00	3	6.00	23.2		6.6							19.68	73.8
7/30/2009	14:50:00	3	7.00	20.2		1.62							22.97	68.4
7/30/2009	14:50:00	3	8.00	15.4		0.03							26.25	59.7
7/30/2009	14:50:00	3	9.00	15.2		0							29.53	59.4
7/30/2009	14:50:00	3	10.00	13.8		0							32.81	56.8
7/30/2009	14:50:00	3	11.00	13.1		0							36.09	55.6
<<insert>>														
<b>Min</b>		3.0	0.0	13.10	0.0	0.00	0	0	7.90	0.00	0.00	0	0.00	55.6
<b>Max</b>		3.0	11.0	24.50	0.0	7.73	0	0	7.90	0.00	0.00	0	36.09	76.1
<b>Max - Min</b>		0.0	11.0	11.40	0.0	7.73	0	0	0.00	0.00	0.00	0	36.09	20.5
<b>Count</b>		12	12	12	0	12	0	0	1	0	0	0	12	12



LWWMD Water Quality Data - 2009  
 ALI Customer No. 1157-03

Insitu Water Quality Data - Lake Wallenpaupack - All Stations  
 Prepared by Aqua Link, Inc.

Database Last Modified: 02/11/11  
 Staff Initials: arl

Insitu Water Quality Data - Station No. 3

Date M/D/Y	Time hh:mm:ss	Site	Depth m	Temp C	DO% %	DO Conc mg/L	Cond uS/cm	SpCond uS/cm	pH s.u.	TDS g/L	Salinity ppt	ORP mV	Conversions	
													Depth (feet)	Temp (Degrees F)
8/20/2009	13:55:00	3	0.00	27.6		7.96			8.69				0.00	81.7
8/20/2009	13:55:00	3	1.00	26.8		8.16							3.28	80.2
8/20/2009	13:55:00	3	2.00	26.5		8.16							6.56	79.7
8/20/2009	13:55:00	3	3.00	26.1		7.93							9.84	79.0
8/20/2009	13:55:00	3	4.00	25.9		7.61							13.12	78.6
8/20/2009	13:55:00	3	5.00	25.7		6.79							16.40	78.3
8/20/2009	13:55:00	3	6.00	24.2		5.14							19.68	75.6
8/20/2009	13:55:00	3	7.00	23.1		3.09							22.97	73.6
8/20/2009	13:55:00	3	8.00	22.1		0.5							26.25	71.8
8/20/2009	13:55:00	3	9.00	18.5		0							29.53	65.3
8/20/2009	13:55:00	3	10.00	15.4		0							32.81	59.7
<<insert>>														
<b>Min</b>		3.0	0.0	15.40	0.0	0.00	0	0	8.69	0.00	0.00	0	0.00	59.7
<b>Max</b>		3.0	10.0	27.60	0.0	8.16	0	0	8.69	0.00	0.00	0	32.81	81.7
<b>Max - Min</b>		0.0	10.0	12.20	0.0	8.16	0	0	0.00	0.00	0.00	0	32.81	22.0
<b>Count</b>		11	11	11	0	11	0	0	1	0	0	0	11	11

LWWMD Water Quality Data - 2009  
 ALI Customer No. 1157-03

Insitu Water Quality Data - Lake Wallenpaupack - All Stations  
 Prepared by Aqua Link, Inc.

Database Last Modified: 02/11/11  
 Staff Initials: arl

Insitu Water Quality Data - Station No. 3

Date M/D/Y	Time hh:mm:ss	Site	Depth m	Temp C	DO% %	DO Conc mg/L	Cond uS/cm	SpCond uS/cm	pH s.u.	TDS g/L	Salinity ppt	ORP mV	Conversions	
													Depth (feet)	Temp (Degrees F)
8/31/2009	10:40:00	3	0.00	22.8		7.03			7.55				0.00	73.0
8/31/2009	10:40:00	3	1.00	23.8		7.09							3.28	74.8
8/31/2009	10:40:00	3	2.00	23.1		6.96							6.56	73.6
8/31/2009	10:40:00	3	3.00	23.1		6.9							9.84	73.6
8/31/2009	10:40:00	3	4.00	23.1		7.07							13.12	73.6
8/31/2009	10:40:00	3	5.00	23.1		7.1							16.40	73.6
8/31/2009	10:40:00	3	6.00	23.1		7.05							19.68	73.6
8/31/2009	10:40:00	3	7.00	22		1.86							22.97	71.6
8/31/2009	10:40:00	3	8.00	19.6		0.11							26.25	67.3
8/31/2009	10:40:00	3	9.00	19		0.02							29.53	66.2
8/31/2009	10:40:00	3	10.00	16		0							32.81	60.8
8/31/2009	10:40:00	3	11.00	14.2		0							36.09	57.6
<<insert>>														
<b>Min</b>		3.0	0.0	14.20	0.0	0.00	0	0	7.55	0.00	0.00	0	0.00	57.6
<b>Max</b>		3.0	11.0	23.80	0.0	7.10	0	0	7.55	0.00	0.00	0	36.09	74.8
<b>Max - Min</b>		0.0	11.0	9.60	0.0	7.10	0	0	0.00	0.00	0.00	0	36.09	17.3
<b>Count</b>		12	12	12	0	12	0	0	1	0	0	0	12	12

LWWMD Water Quality Data - 2009  
 ALI Customer No. 1157-03

Insitu Water Quality Data - Lake Wallenpaupack - All Stations  
 Prepared by Aqua Link, Inc.

Database Last Modified: 02/11/11  
 Staff Initials: arl

Insitu Water Quality Data - Station No. 3

Date M/D/Y	Time hh:mm:ss	Site	Depth m	Temp C	DO% %	DO Conc mg/L	Cond uS/cm	SpCond uS/cm	pH s.u.	TDS g/L	Salinity ppt	ORP mV	Conversions	
													Depth (feet)	Temp (Degrees F)
9/22/2009	14:19:00	3	0.00	19.3		8.8			7.33				0.00	66.7
9/22/2009	14:19:00	3	1.00	19.47		8.63							3.28	67.0
9/22/2009	14:19:00	3	2.00	19.48		8.54							6.56	67.1
9/22/2009	14:19:00	3	3.00	19.47		8.48							9.84	67.0
9/22/2009	14:19:00	3	4.00	19.46		8.37							13.12	67.0
9/22/2009	14:19:00	3	5.00	19.42		8.23							16.40	67.0
9/22/2009	14:19:00	3	6.00	19.3		7.94							19.68	66.7
9/22/2009	14:19:00	3	7.00	19.13		7.59							22.97	66.4
9/22/2009	14:19:00	3	8.00	19.08		7.37							26.25	66.3
9/22/2009	14:19:00	3	9.00	18.81		6.33							29.53	65.9
9/22/2009	14:19:00	3	10.00	17.44		3.94							32.81	63.4
<<insert>>														
<b>Min</b>		3.0	0.0	17.44	0.0	3.94	0	0	7.33	0.00	0.00	0	0.00	63.4
<b>Max</b>		3.0	10.0	19.48	0.0	8.80	0	0	7.33	0.00	0.00	0	32.81	67.1
<b>Max - Min</b>		0.0	10.0	2.04	0.0	4.86	0	0	0.00	0.00	0.00	0	32.81	3.7
<b>Count</b>		11	11	11	0	11	0	0	1	0	0	0	11	11

LWWMD Water Quality Data - 2009  
 ALI Customer No. 1157-03

Insitu Water Quality Data - Lake Wallenpaupack - All Stations  
 Prepared by Aqua Link, Inc.

Database Last Modified: 02/11/11  
 Staff Initials: arl

Insitu Water Quality Data - Station No. 3

Date M/D/Y	Time hh:mm:ss	Site	Depth m	Temp C	DO% %	DO Conc mg/L	Cond uS/cm	SpCond uS/cm	pH s.u.	TDS g/L	Salinity ppt	ORP mV	Conversions	
													Depth (feet)	Temp (Degrees F)
10/13/2009	13:50:00	3	0.00	14.58		10.06			7.17				0.00	58.2
10/13/2009	13:50:00	3	1.00	14.64		9.18							3.28	58.4
10/13/2009	13:50:00	3	2.00	14.64		8.75							6.56	58.4
10/13/2009	13:50:00	3	3.00	14.65		8.45							9.84	58.4
10/13/2009	13:50:00	3	4.00	14.66		8.16							13.12	58.4
10/13/2009	13:50:00	3	5.00	14.66		8.07							16.40	58.4
10/13/2009	13:50:00	3	6.00	14.66		8							19.68	58.4
10/13/2009	13:50:00	3	7.00	14.66		7.91							22.97	58.4
10/13/2009	13:50:00	3	8.00	14.66		7.86							26.25	58.4
10/13/2009	13:50:00	3	9.00	14.66		7.81							29.53	58.4
10/13/2009	13:50:00	3	10.00	14.66		7.79							32.81	58.4
<<insert>>														
<b>Min</b>		3.0	0.0	14.58	0.0	7.79	0	0	7.17	0.00	0.00	0	0.00	58.2
<b>Max</b>		3.0	10.0	14.66	0.0	10.06	0	0	7.17	0.00	0.00	0	32.81	58.4
<b>Max - Min</b>		0.0	10.0	0.08	0.0	2.27	0	0	0.00	0.00	0.00	0	32.81	0.1
<b>Count</b>		11	11	11	0	11	0	0	1	0	0	0	11	11

LWWMD Water Quality Data - 2009  
 ALI Customer No. 1157-03

Insitu Water Quality Data - Lake Wallenpaupack - All Stations  
 Prepared by Aqua Link, Inc.

Database Last Modified: 02/11/11  
 Staff Initials: arl

Insitu Water Quality Data - Station No. 3

Date M/D/Y	Time hh:mm:ss	Site	Depth m	Temp C	DO% %	DO Conc mg/L	Cond uS/cm	SpCond uS/cm	pH s.u.	TDS g/L	Salinity ppt	ORP mV	Conversions	
													Depth (feet)	Temp (Degrees F)
10/27/2009	14:10:00	3	0.00	11.9		7.76			7.21				0.00	53.4
10/27/2009	14:10:00	3	1.00	12		7.21							3.28	53.6
10/27/2009	14:10:00	3	2.00	12.1		7.32							6.56	53.8
10/27/2009	14:10:00	3	3.00	12.1		7.37							9.84	53.8
10/27/2009	14:10:00	3	4.00	12.1		7.12							13.12	53.8
10/27/2009	14:10:00	3	5.00	12.1		7.12							16.40	53.8
10/27/2009	14:10:00	3	6.00	12.1		7.25							19.68	53.8
10/27/2009	14:10:00	3	7.00	12.1		7.25							22.97	53.8
10/27/2009	14:10:00	3	8.00	12.1		7.72							26.25	53.8
10/27/2009	14:10:00	3	9.00	12		7.41							29.53	53.6
10/27/2009	14:10:00	3	10.00	11.9		7.15							32.81	53.4
10/27/2009	14:10:00	3	11.00	11.9		7.13							36.09	53.4
<<insert>>														
<b>Min</b>		3.0	0.0	11.90	0.0	7.12	0	0	7.21	0.00	0.00	0	0.00	53.4
<b>Max</b>		3.0	11.0	12.10	0.0	7.76	0	0	7.21	0.00	0.00	0	36.09	53.8
<b>Max - Min</b>		0.0	11.0	0.20	0.0	0.64	0	0	0.00	0.00	0.00	0	36.09	0.4
<b>Count</b>		12	12	12	0	12	0	0	1	0	0	0	12	12

LWWMD Water Quality Data - 2009  
 ALI Customer No. 1157-03

Insitu Water Quality Data - Lake Wallenpaupack - All Stations  
 Prepared by Aqua Link, Inc.

Database Last Modified: 02/11/11  
 Staff Initials: arl

Insitu Water Quality Data - Station No. 3

Date M/D/Y	Time hh:mm:ss	Site	Depth m	Temp C	DO% %	DO Conc mg/L	Cond uS/cm	SpCond uS/cm	pH s.u.	TDS g/L	Salinity ppt	ORP mV	Conversions	
													Depth (feet)	Temp (Degrees F)
11/12/2009		3	0.00	10.2		9.6			8.38				0.00	50.4
11/12/2009		3	1.00	10.19		9.51							3.28	50.3
11/12/2009		3	2.00	10.19		9.47							6.56	50.3
11/12/2009		3	3.00	10.19		9.43							9.84	50.3
11/12/2009		3	4.00	10.2		9.41							13.12	50.4
11/12/2009		3	5.00	10.19		9.38							16.40	50.3
11/12/2009		3	6.00	10.19		9.35							19.68	50.3
11/12/2009		3	7.00	10.19		9.32							22.97	50.3
11/12/2009		3	8.00	10.19		9.29							26.25	50.3
11/12/2009		3	9.00	10.19		9.29							29.53	50.3
11/12/2009		3	10.00	10.19		9.39							32.81	50.3
11/12/2009		3	11.00	10.19		9.3							36.09	50.3
<<insert>>														
<b>Min</b>		3.0	0.0	10.19	0.0	9.29	0	0	8.38	0.00	0.00	0	0.00	50.3
<b>Max</b>		3.0	11.0	10.20	0.0	9.60	0	0	8.38	0.00	0.00	0	36.09	50.4
<b>Max - Min</b>		0.0	11.0	0.01	0.0	0.31	0	0	0.00	0.00	0.00	0	36.09	0.0
<b>Count</b>		12	12	12	0	12	0	0	1	0	0	0	12	12

LWWMD Water Quality Data - 2009  
 ALI Customer No. 1157-03

Insitu Water Quality Data - Lake Wallenpaupack - All Stations  
 Prepared by Aqua Link, Inc.

Database Last Modified: 02/11/11  
 Staff Initials: arl

Insitu Water Quality Data - Station No. 4

Date M/D/Y	Time hh:mm:ss	Site	Depth m	Temp C	DO% %	DO Conc mg/L	Cond uS/cm	SpCond uS/cm	pH s.u.	TDS g/L	Salinity ppt	ORP mV	Conversions	
													Depth (feet)	Temp (Degrees F)
5/13/2009	13:05:00	4	0.00	14.6		10.37			8.86				0.00	58.3
5/13/2009	13:05:00	4	1.00	14.5		10.31							3.28	58.1
5/13/2009	13:05:00	4	2.00	14.4		10.4							6.56	57.9
5/13/2009	13:05:00	4	3.00	13.8		10.2							9.84	56.8
5/13/2009	13:05:00	4	4.00	13.6		10.21							13.12	56.5
5/13/2009	13:05:00	4	5.00	13.4		9.65							16.40	56.1
5/13/2009	13:05:00	4	6.00	12.8		9.49							19.68	55.0
5/13/2009	13:05:00	4	7.00	12.5		9.23							22.97	54.5
5/13/2009	13:05:00	4	8.00	12.1		8.93							26.25	53.8
5/13/2009	13:05:00	4	9.00	10.5		7.41							29.53	50.9
5/13/2009	13:05:00	4	10.00	9.7		6.05							32.81	49.5
5/13/2009	13:05:00	4	11.00	9.5		5.85							36.09	49.1
<<insert>>														
<b>Min</b>		4.0	0.0	9.50	0.0	5.85	0	0	8.86	0.00	0.00	0	0.00	49.1
<b>Max</b>		4.0	11.0	14.60	0.0	10.40	0	0	8.86	0.00	0.00	0	36.09	58.3
<b>Max - Min</b>		0.0	11.0	5.10	0.0	4.55	0	0	0.00	0.00	0.00	0	36.09	9.2
<b>Count</b>		12	12	12	0	12	0	0	1	0	0	0	12	12

LWWMD Water Quality Data - 2009  
 ALI Customer No. 1157-03

Insitu Water Quality Data - Lake Wallenpaupack - All Stations  
 Prepared by Aqua Link, Inc.

Database Last Modified: 02/11/11  
 Staff Initials: arl

Insitu Water Quality Data - Station No. 4

Date M/D/Y	Time hh:mm:ss	Site	Depth m	Temp C	DO% %	DO Conc mg/L	Cond uS/cm	SpCond uS/cm	pH s.u.	TDS g/L	Salinity ppt	ORP mV	Conversions	
													Depth (feet)	Temp (Degrees F)
5/26/2009	13:43:00	4	0.00	17.5		9.4			7.99				0.00	63.5
5/26/2009	13:43:00	4	1.00	17.7		9.08							3.28	63.9
5/26/2009	13:43:00	4	2.00	17.7		9.28							6.56	63.9
5/26/2009	13:43:00	4	3.00	17.7		9.16							9.84	63.9
5/26/2009	13:43:00	4	4.00	17.7		9.18							13.12	63.9
5/26/2009	13:43:00	4	5.00	17.7		9.27							16.40	63.9
5/26/2009	13:43:00	4	6.00	17.7		9.18							19.68	63.9
5/26/2009	13:43:00	4	7.00	13.5		8.04							22.97	56.3
5/26/2009	13:43:00	4	8.00	13.2		7.85							26.25	55.8
5/26/2009	13:43:00	4	9.00	13		7.52							29.53	55.4
5/26/2009	13:43:00	4	10.00	12.4		6.26							32.81	54.3
5/26/2009	13:43:00	4	11.00	11.19		3.84							36.09	52.1
<<insert>>														
<b>Min</b>		4.0	0.0	11.19	0.0	3.84	0	0	7.99	0.00	0.00	0	0.00	52.1
<b>Max</b>		4.0	11.0	17.70	0.0	9.40	0	0	7.99	0.00	0.00	0	36.09	63.9
<b>Max - Min</b>		0.0	11.0	6.51	0.0	5.56	0	0	0.00	0.00	0.00	0	36.09	11.7
<b>Count</b>		12	12	12	0	12	0	0	1	0	0	0	12	12



LWWMD Water Quality Data - 2009  
 ALI Customer No. 1157-03

Insitu Water Quality Data - Lake Wallenpaupack - All Stations  
 Prepared by Aqua Link, Inc.

Database Last Modified: 02/11/11  
 Staff Initials: arl

Insitu Water Quality Data - Station No. 4

Date M/D/Y	Time hh:mm:ss	Site	Depth m	Temp C	DO% %	DO Conc mg/L	Cond uS/cm	SpCond uS/cm	pH s.u.	TDS g/L	Salinity ppt	ORP mV	Conversions	
													Depth (feet)	Temp (Degrees F)
6/9/2009	13:10:00	4	0.00	21.4		8.2			8.02				0.00	70.5
6/9/2009	13:10:00	4	1.00	21.3		8.13							3.28	70.3
6/9/2009	13:10:00	4	2.00	20.5		8.03							6.56	68.9
6/9/2009	13:10:00	4	3.00	20.1		7.99							9.84	68.2
6/9/2009	13:10:00	4	4.00	19		8.27							13.12	66.2
6/9/2009	13:10:00	4	5.00	18.1		8.32							16.40	64.6
6/9/2009	13:10:00	4	6.00	17.5		7.85							19.68	63.5
6/9/2009	13:10:00	4	7.00	17		7.7							22.97	62.6
6/9/2009	13:10:00	4	8.00	15.8		6.75							26.25	60.4
6/9/2009	13:10:00	4	9.00	14		4.47							29.53	57.2
6/9/2009	13:10:00	4	10.00	12.6		2							32.81	54.7
6/9/2009	13:10:00	4	11.00	12.2		1.25							36.09	54.0
<<insert>>														
<b>Min</b>		4.0	0.0	12.20	0.0	1.25	0	0	8.02	0.00	0.00	0	0.00	54.0
<b>Max</b>		4.0	11.0	21.40	0.0	8.32	0	0	8.02	0.00	0.00	0	36.09	70.5
<b>Max - Min</b>		0.0	11.0	9.20	0.0	7.07	0	0	0.00	0.00	0.00	0	36.09	16.6
<b>Count</b>		12	12	12	0	12	0	0	1	0	0	0	12	12

LWWMD Water Quality Data - 2009  
 ALI Customer No. 1157-03

Insitu Water Quality Data - Lake Wallenpaupack - All Stations  
 Prepared by Aqua Link, Inc.

Database Last Modified: 02/11/11  
 Staff Initials: arl

Insitu Water Quality Data - Station No. 4

Date M/D/Y	Time hh:mm:ss	Site	Depth m	Temp C	DO% %	DO Conc mg/L	Cond uS/cm	SpCond uS/cm	pH s.u.	TDS g/L	Salinity ppt	ORP mV	Conversions	
													Depth (feet)	Temp (Degrees F)
6/23/2009	14:11:00	4	0.00	21.1		8.71		22	7.9				0.00	70.0
6/23/2009	14:11:00	4	1.00	21.1		8.47							3.28	70.0
6/23/2009	14:11:00	4	2.00	20.9		8.54							6.56	69.6
6/23/2009	14:11:00	4	3.00	20.8		8.58							9.84	69.4
6/23/2009	14:11:00	4	4.00	20.7		8.41							13.12	69.3
6/23/2009	14:11:00	4	5.00	20.7		8.49							16.40	69.3
6/23/2009	14:11:00	4	6.00	20.7		8.53							19.68	69.3
6/23/2009	14:11:00	4	7.00	20.6		8.42							22.97	69.1
6/23/2009	14:11:00	4	8.00	19.6		7.37							26.25	67.3
6/23/2009	14:11:00	4	9.00	16		5.26							29.53	60.8
6/23/2009	14:11:00	4	10.00	14.2		1.88							32.81	57.6
<<insert>>														
<b>Min</b>		4.0	0.0	14.20	0.0	1.88	0	22	7.90	0.00	0.00	0	0.00	57.6
<b>Max</b>		4.0	10.0	21.10	0.0	8.71	0	22	7.90	0.00	0.00	0	32.81	70.0
<b>Max - Min</b>		0.0	10.0	6.90	0.0	6.83	0	0	0.00	0.00	0.00	0	32.81	12.4
<b>Count</b>		11	11	11	0	11	0	1	1	0	0	0	11	11

LWWMD Water Quality Data - 2009  
 ALI Customer No. 1157-03

Insitu Water Quality Data - Lake Wallenpaupack - All Stations  
 Prepared by Aqua Link, Inc.

Database Last Modified: 02/11/11  
 Staff Initials: arl

Insitu Water Quality Data - Station No. 4

Date M/D/Y	Time hh:mm:ss	Site	Depth m	Temp C	DO% %	DO Conc mg/L	Cond uS/cm	SpCond uS/cm	pH s.u.	TDS g/L	Salinity ppt	ORP mV	Conversions	
													Depth (feet)	Temp (Degrees F)
7/9/2009	13:20:00	4	0.00	22.9		8.25			7.95				0.00	73.2
7/9/2009	13:20:00	4	1.00	22.8		8.02							3.28	73.0
7/9/2009	13:20:00	4	2.00	22.5		8.08							6.56	72.5
7/9/2009	13:20:00	4	3.00	22.3		8.17							9.84	72.1
7/9/2009	13:20:00	4	4.00	22.1		8.27							13.12	71.8
7/9/2009	13:20:00	4	5.00	21.9		7.92							16.40	71.4
7/9/2009	13:20:00	4	6.00	20.9		5.67							19.68	69.6
7/9/2009	13:20:00	4	7.00	19.8		4.48							22.97	67.6
7/9/2009	13:20:00	4	8.00	17.5		2.47							26.25	63.5
7/9/2009	13:20:00	4	9.00	14.7		0.18							29.53	58.5
7/9/2009	13:20:00	4	10.00	13.2		0							32.81	55.8
<<insert>>														
<b>Min</b>		4.0	0.0	13.20	0.0	0.00	0	0	7.95	0.00	0.00	0	0.00	55.8
<b>Max</b>		4.0	10.0	22.90	0.0	8.27	0	0	7.95	0.00	0.00	0	32.81	73.2
<b>Max - Min</b>		0.0	10.0	9.70	0.0	8.27	0	0	0.00	0.00	0.00	0	32.81	17.5
<b>Count</b>		11	11	11	0	11	0	0	1	0	0	0	11	11

LWWMD Water Quality Data - 2009  
 ALI Customer No. 1157-03

Insitu Water Quality Data - Lake Wallenpaupack - All Stations  
 Prepared by Aqua Link, Inc.

Database Last Modified: 02/11/11  
 Staff Initials: arl

Insitu Water Quality Data - Station No. 4

Date M/D/Y	Time hh:mm:ss	Site	Depth m	Temp C	DO% %	DO Conc mg/L	Cond uS/cm	SpCond uS/cm	pH s.u.	TDS g/L	Salinity ppt	ORP mV	Conversions	
													Depth (feet)	Temp (Degrees F)
7/30/2009	14:05:00	4	0.00	24.6		7.88			7.89				0.00	76.3
7/30/2009	14:05:00	4	1.00	24.5		7.7							3.28	76.1
7/30/2009	14:05:00	4	2.00	24.3		7.7							6.56	75.7
7/30/2009	14:05:00	4	3.00	23.8		7.7							9.84	74.8
7/30/2009	14:05:00	4	4.00	23.7		7.66							13.12	74.7
7/30/2009	14:05:00	4	5.00	23.6		7.77							16.40	74.5
7/30/2009	14:05:00	4	6.00	22.2		4.98							19.68	72.0
7/30/2009	14:05:00	4	7.00	21.2		2.7							22.97	70.2
7/30/2009	14:05:00	4	8.00	18.9		0.25							26.25	66.0
7/30/2009	14:05:00	4	9.00	16.6		0							29.53	61.9
<<insert>>														
<b>Min</b>		4.0	0.0	16.60	0.0	0.00	0	0	7.89	0.00	0.00	0	0.00	61.9
<b>Max</b>		4.0	9.0	24.60	0.0	7.88	0	0	7.89	0.00	0.00	0	29.53	76.3
<b>Max - Min</b>		0.0	9.0	8.00	0.0	7.88	0	0	0.00	0.00	0.00	0	29.53	14.4
<b>Count</b>		10	10	10	0	10	0	0	1	0	0	0	10	10

LWWMD Water Quality Data - 2009  
 ALI Customer No. 1157-03

Insitu Water Quality Data - Lake Wallenpaupack - All Stations  
 Prepared by Aqua Link, Inc.

Database Last Modified: 02/11/11  
 Staff Initials: arl

Insitu Water Quality Data - Station No. 4

Date M/D/Y	Time hh:mm:ss	Site	Depth m	Temp C	DO% %	DO Conc mg/L	Cond uS/cm	SpCond uS/cm	pH s.u.	TDS g/L	Salinity ppt	ORP mV	Conversions	
													Depth (feet)	Temp (Degrees F)
8/20/2009	13:25:00	4	0.00	26.8		7.98			8.8				0.00	80.2
8/20/2009	13:25:00	4	1.00	26.4		8.28							3.28	79.5
8/20/2009	13:25:00	4	2.00	26.3		8.43							6.56	79.3
8/20/2009	13:25:00	4	3.00	25.5		7.87							9.84	77.9
8/20/2009	13:25:00	4	4.00	25.2		7.3							13.12	77.4
8/20/2009	13:25:00	4	5.00	24.2		5.05							16.40	75.6
8/20/2009	13:25:00	4	6.00	23		3.2							19.68	73.4
8/20/2009	13:25:00	4	7.00	22.2		1.24							22.97	72.0
8/20/2009	13:25:00	4	8.00	19.8		0.01							26.25	67.6
<<insert>>														
<b>Min</b>		4.0	0.0	19.80	0.0	0.01	0	0	8.80	0.00	0.00	0	0.00	67.6
<b>Max</b>		4.0	8.0	26.80	0.0	8.43	0	0	8.80	0.00	0.00	0	26.25	80.2
<b>Max - Min</b>		0.0	8.0	7.00	0.0	8.42	0	0	0.00	0.00	0.00	0	26.25	12.6
<b>Count</b>		9	9	9	0	9	0	0	1	0	0	0	9	9

LWWMD Water Quality Data - 2009  
 ALI Customer No. 1157-03

Insitu Water Quality Data - Lake Wallenpaupack - All Stations  
 Prepared by Aqua Link, Inc.

Database Last Modified: 02/11/11  
 Staff Initials: arl

Insitu Water Quality Data - Station No. 4

Date M/D/Y	Time hh:mm:ss	Site	Depth m	Temp C	DO% %	DO Conc mg/L	Cond uS/cm	SpCond uS/cm	pH s.u.	TDS g/L	Salinity ppt	ORP mV	Conversions	
													Depth (feet)	Temp (Degrees F)
8/31/2009	11:25:00	4	0.00	22.9		7.25			7.31				0.00	73.2
8/31/2009	11:25:00	4	1.00	23		7.42							3.28	73.4
8/31/2009	11:25:00	4	2.00	23.1		7.03							6.56	73.6
8/31/2009	11:25:00	4	3.00	23.2		7.07							9.84	73.8
8/31/2009	11:25:00	4	4.00	23.2		6.97							13.12	73.8
8/31/2009	11:25:00	4	5.00	23.2		6.93							16.40	73.8
8/31/2009	11:25:00	4	6.00	23.1		6.9							19.68	73.6
8/31/2009	11:25:00	4	7.00	21.5		1.32							22.97	70.7
8/31/2009	11:25:00	4	8.00	19.4		0.04							26.25	66.9
8/31/2009	11:25:00	4	9.00	17		0							29.53	62.6
<<insert>>														
<b>Min</b>		4.0	0.0	17.00	0.0	0.00	0	0	7.31	0.00	0.00	0	0.00	62.6
<b>Max</b>		4.0	9.0	23.20	0.0	7.42	0	0	7.31	0.00	0.00	0	29.53	73.8
<b>Max - Min</b>		0.0	9.0	6.20	0.0	7.42	0	0	0.00	0.00	0.00	0	29.53	11.2
<b>Count</b>		10	10	10	0	10	0	0	1	0	0	0	10	10

LWWMD Water Quality Data - 2009  
 ALI Customer No. 1157-03

Insitu Water Quality Data - Lake Wallenpaupack - All Stations  
 Prepared by Aqua Link, Inc.

Database Last Modified: 02/11/11  
 Staff Initials: arl

Insitu Water Quality Data - Station No. 4

Date M/D/Y	Time hh:mm:ss	Site	Depth m	Temp C	DO% %	DO Conc mg/L	Cond uS/cm	SpCond uS/cm	pH s.u.	TDS g/L	Salinity ppt	ORP mV	Conversions	
													Depth (feet)	Temp (Degrees F)
9/22/2009	13:51:00	4	0.00	19.37		8.91			7.42				0.00	66.9
9/22/2009	13:51:00	4	1.00	19.45		8.76							3.28	67.0
9/22/2009	13:51:00	4	2.00	19.45		8.67							6.56	67.0
9/22/2009	13:51:00	4	3.00	19.44		8.58							9.84	67.0
9/22/2009	13:51:00	4	4.00	19.34		8.39							13.12	66.8
9/22/2009	13:51:00	4	5.00	19.15		7.91							16.40	66.5
9/22/2009	13:51:00	4	6.00	19.08		7.53							19.68	66.3
9/22/2009	13:51:00	4	7.00	18.92		6.61							22.97	66.1
9/22/2009	13:51:00	4	8.00	18.73		6.2							26.25	65.7
<<insert>>														
<b>Min</b>		4.0	0.0	18.73	0.0	6.20	0	0	7.42	0.00	0.00	0	0.00	65.7
<b>Max</b>		4.0	8.0	19.45	0.0	8.91	0	0	7.42	0.00	0.00	0	26.25	67.0
<b>Max - Min</b>		0.0	8.0	0.72	0.0	2.71	0	0	0.00	0.00	0.00	0	26.25	1.3
<b>Count</b>		9	9	9	0	9	0	0	1	0	0	0	9	9

LWWMD Water Quality Data - 2009  
 ALI Customer No. 1157-03

Insitu Water Quality Data - Lake Wallenpaupack - All Stations  
 Prepared by Aqua Link, Inc.

Database Last Modified: 02/11/11  
 Staff Initials: arl

Insitu Water Quality Data - Station No. 4

Date M/D/Y	Time hh:mm:ss	Site	Depth m	Temp C	DO% %	DO Conc mg/L	Cond uS/cm	SpCond uS/cm	pH s.u.	TDS g/L	Salinity ppt	ORP mV	Conversions	
													Depth (feet)	Temp (Degrees F)
10/13/2009	13:25:00	4	0.00	14.54		10.35			7.51				0.00	58.2
10/13/2009	13:25:00	4	1.00	14.57		9.57							3.28	58.2
10/13/2009	13:25:00	4	2.00	14.56		9.13							6.56	58.2
10/13/2009	13:25:00	4	3.00	14.59		8.84							9.84	58.3
10/13/2009	13:25:00	4	4.00	14.6		8.75							13.12	58.3
10/13/2009	13:25:00	4	5.00	14.6		8.66							16.40	58.3
10/13/2009	13:25:00	4	6.00	14.59		8.6							19.68	58.3
10/13/2009	13:25:00	4	7.00	14.59		8.54							22.97	58.3
10/13/2009	13:25:00	4	8.00	14.59		8.49							26.25	58.3
<<insert>>														
<b>Min</b>		4.0	0.0	14.54	0.0	8.49	0	0	7.51	0.00	0.00	0	0.00	58.2
<b>Max</b>		4.0	8.0	14.60	0.0	10.35	0	0	7.51	0.00	0.00	0	26.25	58.3
<b>Max - Min</b>		0.0	8.0	0.06	0.0	1.86	0	0	0.00	0.00	0.00	0	26.25	0.1
<b>Count</b>		9	9	9	0	9	0	0	1	0	0	0	9	9



LWWMD Water Quality Data - 2009  
 ALI Customer No. 1157-03

Insitu Water Quality Data - Lake Wallenpaupack - All Stations  
 Prepared by Aqua Link, Inc.

Database Last Modified: 02/11/11  
 Staff Initials: arl

Insitu Water Quality Data - Station No. 4

Date M/D/Y	Time hh:mm:ss	Site	Depth m	Temp C	DO% %	DO Conc mg/L	Cond uS/cm	SpCond uS/cm	pH s.u.	TDS g/L	Salinity ppt	ORP mV	Conversions	
													Depth (feet)	Temp (Degrees F)
10/27/2009	13:40:00	4	0.00	11.6		8.25			7.45				0.00	52.9
10/27/2009	13:40:00	4	1.00	11.7		7.97							3.28	53.1
10/27/2009	13:40:00	4	2.00	11.7		7.74							6.56	53.1
10/27/2009	13:40:00	4	3.00	11.8		7.78							9.84	53.2
10/27/2009	13:40:00	4	4.00	11.8		7.52							13.12	53.2
10/27/2009	13:40:00	4	5.00	11.8		7.55							16.40	53.2
10/27/2009	13:40:00	4	6.00	11.8		7.79							19.68	53.2
10/27/2009	13:40:00	4	7.00	11.8		7.73							22.97	53.2
10/27/2009	13:40:00	4	8.00	11.8		7.73							26.25	53.2
10/27/2009	13:40:00	4	9.00	11.8		7.67							29.53	53.2
<<insert>>														
<b>Min</b>		4.0	0.0	11.60	0.0	7.52	0	0	7.45	0.00	0.00	0	0.00	52.9
<b>Max</b>		4.0	9.0	11.80	0.0	8.25	0	0	7.45	0.00	0.00	0	29.53	53.2
<b>Max - Min</b>		0.0	9.0	0.20	0.0	0.73	0	0	0.00	0.00	0.00	0	29.53	0.4
<b>Count</b>		10	10	10	0	10	0	0	1	0	0	0	10	10

LWWMD Water Quality Data - 2009  
 ALI Customer No. 1157-03

Insitu Water Quality Data - Lake Wallenpaupack - All Stations  
 Prepared by Aqua Link, Inc.

Database Last Modified: 02/11/11  
 Staff Initials: arl

Insitu Water Quality Data - Station No. 5

Date M/D/Y	Time hh:mm:ss	Site	Depth m	Temp C	DO% %	DO Conc mg/L	Cond uS/cm	SpCond uS/cm	pH s.u.	TDS g/L	Salinity ppt	ORP mV	Conversions	
													Depth (feet)	Temp (Degrees F)
5/13/2009	12:25:00	5	0.00	14.1		9.75							0.00	57.4
5/13/2009	12:25:00	5	1.00	13.8		9.55							3.28	56.8
5/13/2009	12:25:00	5	2.00	13.7		9.43							6.56	56.7
5/13/2009	12:25:00	5	3.00	13.6		9.73							9.84	56.5
5/13/2009	12:25:00	5	4.00	12.5		8.7							13.12	54.5
5/13/2009	12:25:00	5	5.00	12.1		8.77							16.40	53.8
5/13/2009	12:25:00	5	6.00	12		8.58							19.68	53.6
5/13/2009	12:25:00	5	7.00	11.9		8.82							22.97	53.4
<<insert>>														
<b>Min</b>		5.0	0.0	11.90	0.0	8.58	0	0	0.00	0.00	0.00	0	0.00	53.4
<b>Max</b>		5.0	7.0	14.10	0.0	9.75	0	0	0.00	0.00	0.00	0	22.97	57.4
<b>Max - Min</b>		0.0	7.0	2.20	0.0	1.17	0	0	0.00	0.00	0.00	0	22.97	4.0
<b>Count</b>		8	8	8	0	8	0	0	0	0	0	0	8	8

LWWMD Water Quality Data - 2009  
 ALI Customer No. 1157-03

Insitu Water Quality Data - Lake Wallenpaupack - All Stations  
 Prepared by Aqua Link, Inc.

Database Last Modified: 02/11/11  
 Staff Initials: arl

Insitu Water Quality Data - Station No. 5

Date M/D/Y	Time hh:mm:ss	Site	Depth m	Temp C	DO% %	DO Conc mg/L	Cond uS/cm	SpCond uS/cm	pH s.u.	TDS g/L	Salinity ppt	ORP mV	Conversions	
													Depth (feet)	Temp (Degrees F)
5/26/2009	13:15:00	5	0.00	16.7		8.72			7.35				0.00	62.1
5/26/2009	13:15:00	5	1.00	17.8		8.64							3.28	64.0
5/26/2009	13:15:00	5	2.00	17.8		8.74							6.56	64.0
5/26/2009	13:15:00	5	3.00	17.7		8.7							9.84	63.9
5/26/2009	13:15:00	5	4.00	17.6		8.68							13.12	63.7
5/26/2009	13:15:00	5	5.00	17.6		8.73							16.40	63.7
5/26/2009	13:15:00	5	6.00	17.2		8.08							19.68	63.0
5/26/2009	13:15:00	5	7.00	15.1		6.74							22.97	59.2
<<insert>>														
<b>Min</b>		5.0	0.0	15.10	0.0	6.74	0	0	7.35	0.00	0.00	0	0.00	59.2
<b>Max</b>		5.0	7.0	17.80	0.0	8.74	0	0	7.35	0.00	0.00	0	22.97	64.0
<b>Max - Min</b>		0.0	7.0	2.70	0.0	2.00	0	0	0.00	0.00	0.00	0	22.97	4.9
<b>Count</b>		8	8	8	0	8	0	0	1	0	0	0	8	8

LWWMD Water Quality Data - 2009  
 ALI Customer No. 1157-03

Insitu Water Quality Data - Lake Wallenpaupack - All Stations  
 Prepared by Aqua Link, Inc.

Database Last Modified: 02/11/11  
 Staff Initials: arl

Insitu Water Quality Data - Station No. 5

Date M/D/Y	Time hh:mm:ss	Site	Depth m	Temp C	DO% %	DO Conc mg/L	Cond uS/cm	SpCond uS/cm	pH s.u.	TDS g/L	Salinity ppt	ORP mV	Conversions	
													Depth (feet)	Temp (Degrees F)
6/9/2009	12:38:00	5	0.00	22.1		8.02			7.53				0.00	71.8
6/9/2009	12:38:00	5	1.00	21.8		7.91							3.28	71.2
6/9/2009	12:38:00	5	2.00	21.2		8.32							6.56	70.2
6/9/2009	12:38:00	5	3.00	20.5		7.95							9.84	68.9
6/9/2009	12:38:00	5	4.00	19.4		7.79							13.12	66.9
6/9/2009	12:38:00	5	5.00	17.9		7.32							16.40	64.2
6/9/2009	12:38:00	5	6.00	17.2		6.22							19.68	63.0
6/9/2009	12:38:00	5	7.00	15.8		5.33							22.97	60.4
<<insert>>														
<b>Min</b>		5.0	0.0	15.80	0.0	5.33	0	0	7.53	0.00	0.00	0	0.00	60.4
<b>Max</b>		5.0	7.0	22.10	0.0	8.32	0	0	7.53	0.00	0.00	0	22.97	71.8
<b>Max - Min</b>		0.0	7.0	6.30	0.0	2.99	0	0	0.00	0.00	0.00	0	22.97	11.3
<b>Count</b>		8	8	8	0	8	0	0	1	0	0	0	8	8

LWWMD Water Quality Data - 2009  
 ALI Customer No. 1157-03

Insitu Water Quality Data - Lake Wallenpaupack - All Stations  
 Prepared by Aqua Link, Inc.

Database Last Modified: 02/11/11  
 Staff Initials: arl

Insitu Water Quality Data - Station No. 5

Date M/D/Y	Time hh:mm:ss	Site	Depth m	Temp C	DO% %	DO Conc mg/L	Cond uS/cm	SpCond uS/cm	pH s.u.	TDS g/L	Salinity ppt	ORP mV	Conversions	
													Depth (feet)	Temp (Degrees F)
6/23/2009	13:40:00	5	0.00	21.6		8.15			8.15				0.00	70.9
6/23/2009	13:40:00	5	1.00	21.5		8.02							3.28	70.7
6/23/2009	13:40:00	5	2.00	21.3		8.07							6.56	70.3
6/23/2009	13:40:00	5	3.00	20.9		8.31							9.84	69.6
6/23/2009	13:40:00	5	4.00	20.1		7.8							13.12	68.2
6/23/2009	13:40:00	5	5.00	19		7.24							16.40	66.2
6/23/2009	13:40:00	5	6.00	18.3		7.19							19.68	64.9
6/23/2009	13:40:00	5	7.00	17.5		6.89							22.97	63.5
6/23/2009	13:40:00	5	8.00	17.3		2.01							26.25	63.1
<<insert>>														
<b>Min</b>		5.0	0.0	17.30	0.0	2.01	0	0	8.15	0.00	0.00	0	0.00	63.1
<b>Max</b>		5.0	8.0	21.60	0.0	8.31	0	0	8.15	0.00	0.00	0	26.25	70.9
<b>Max - Min</b>		0.0	8.0	4.30	0.0	6.30	0	0	0.00	0.00	0.00	0	26.25	7.7
<b>Count</b>		9	9	9	0	9	0	0	1	0	0	0	9	9

LWWMD Water Quality Data - 2009  
 ALI Customer No. 1157-03

Insitu Water Quality Data - Lake Wallenpaupack - All Stations  
 Prepared by Aqua Link, Inc.

Database Last Modified: 02/11/11  
 Staff Initials: arl

Insitu Water Quality Data - Station No. 5

Date M/D/Y	Time hh:mm:ss	Site	Depth m	Temp C	DO% %	DO Conc mg/L	Cond uS/cm	SpCond uS/cm	pH s.u.	TDS g/L	Salinity ppt	ORP mV	Conversions	
													Depth (feet)	Temp (Degrees F)
7/9/2009	12:50:00	5	0.00	22.3		8.32			7.6				0.00	72.1
7/9/2009	12:50:00	5	1.00	22		8.26							3.28	71.6
7/9/2009	12:50:00	5	2.00	21.5		8.5							6.56	70.7
7/9/2009	12:50:00	5	3.00	21.4		8.1							9.84	70.5
7/9/2009	12:50:00	5	4.00	21.2		7.47							13.12	70.2
7/9/2009	12:50:00	5	5.00	21.1		7.52							16.40	70.0
7/9/2009	12:50:00	5	6.00	20.4		6.75							19.68	68.7
<<insert>>														
<b>Min</b>		5.0	0.0	20.40	0.0	6.75	0	0	7.60	0.00	0.00	0	0.00	68.7
<b>Max</b>		5.0	6.0	22.30	0.0	8.50	0	0	7.60	0.00	0.00	0	19.68	72.1
<b>Max - Min</b>		0.0	6.0	1.90	0.0	1.75	0	0	0.00	0.00	0.00	0	19.68	3.4
<b>Count</b>		7	7	7	0	7	0	0	1	0	0	0	7	7

LWWMD Water Quality Data - 2009  
 ALI Customer No. 1157-03

Insitu Water Quality Data - Lake Wallenpaupack - All Stations  
 Prepared by Aqua Link, Inc.

Database Last Modified: 02/11/11  
 Staff Initials: arl

Insitu Water Quality Data - Station No. 5

Date M/D/Y	Time hh:mm:ss	Site	Depth m	Temp C	DO% %	DO Conc mg/L	Cond uS/cm	SpCond uS/cm	pH s.u.	TDS g/L	Salinity ppt	ORP mV	Conversions	
													Depth (feet)	Temp (Degrees F)
7/30/2009	13:30:00	5	0.00	25.7		7.96			7.96				0.00	78.3
7/30/2009	13:30:00	5	1.00	24.7		7.36							3.28	76.5
7/30/2009	13:30:00	5	2.00	23.7		7.3							6.56	74.7
7/30/2009	13:30:00	5	3.00	23		6.95							9.84	73.4
7/30/2009	13:30:00	5	4.00	22.7		6.86							13.12	72.9
7/30/2009	13:30:00	5	5.00	21.9		6.75							16.40	71.4
<<insert>>														
<b>Min</b>		5.0	0.0	21.90	0.0	6.75	0	0	7.96	0.00	0.00	0	0.00	71.4
<b>Max</b>		5.0	5.0	25.70	0.0	7.96	0	0	7.96	0.00	0.00	0	16.40	78.3
<b>Max - Min</b>		0.0	5.0	3.80	0.0	1.21	0	0	0.00	0.00	0.00	0	16.40	6.8
<b>Count</b>		6	6	6	0	6	0	0	1	0	0	0	6	6

LWWMD Water Quality Data - 2009  
 ALI Customer No. 1157-03

Insitu Water Quality Data - Lake Wallenpaupack - All Stations  
 Prepared by Aqua Link, Inc.

Database Last Modified: 02/11/11  
 Staff Initials: arl

Insitu Water Quality Data - Station No. 5

Date M/D/Y	Time hh:mm:ss	Site	Depth m	Temp C	DO% %	DO Conc mg/L	Cond uS/cm	SpCond uS/cm	pH s.u.	TDS g/L	Salinity ppt	ORP mV	Conversions	
													Depth (feet)	Temp (Degrees F)
8/20/2009	12:40:00	5	0.00	26		8.66			7.81				0.00	78.8
8/20/2009	12:40:00	5	1.00	26.2		9.41							3.28	79.2
8/20/2009	12:40:00	5	2.00	25.1		8.34							6.56	77.2
8/20/2009	12:40:00	5	3.00	25.5		8.1							9.84	77.9
8/20/2009	12:40:00	5	4.00	25.4		6.3							13.12	77.7
8/20/2009	12:40:00	5	5.00	25.4		5.25							16.40	77.7
8/20/2009	12:40:00	5	6.00	25.2		4.93							19.68	77.4
<<insert>>														
<b>Min</b>		5.0	0.0	25.10	0.0	4.93	0	0	7.81	0.00	0.00	0	0.00	77.2
<b>Max</b>		5.0	6.0	26.20	0.0	9.41	0	0	7.81	0.00	0.00	0	19.68	79.2
<b>Max - Min</b>		0.0	6.0	1.10	0.0	4.48	0	0	0.00	0.00	0.00	0	19.68	2.0
<b>Count</b>		7	7	7	0	7	0	0	1	0	0	0	7	7



LWWMD Water Quality Data - 2009  
 ALI Customer No. 1157-03

Insitu Water Quality Data - Lake Wallenpaupack - All Stations  
 Prepared by Aqua Link, Inc.

Database Last Modified: 02/11/11  
 Staff Initials: arl

Insitu Water Quality Data - Station No. 5

Date M/D/Y	Time hh:mm:ss	Site	Depth m	Temp C	DO% %	DO Conc mg/L	Cond uS/cm	SpCond uS/cm	pH s.u.	TDS g/L	Salinity ppt	ORP mV	Conversions	
													Depth (feet)	Temp (Degrees F)
8/31/2009	12:05:00	5	0.00	22.9		0.1			7.63				0.00	73.2
8/31/2009	12:05:00	5	1.00	23		0.1							3.28	73.4
8/31/2009	12:05:00	5	2.00	23		0.1							6.56	73.4
8/31/2009	12:05:00	5	3.00	22.7		0.1							9.84	72.9
8/31/2009	12:05:00	5	4.00	22.5									13.12	72.5
<<insert>>														
<b>Min</b>		5.0	0.0	22.50	0.0	0.10	0	0	7.63	0.00	0.00	0	0.00	72.5
<b>Max</b>		5.0	4.0	23.00	0.0	0.10	0	0	7.63	0.00	0.00	0	13.12	73.4
<b>Max - Min</b>		0.0	4.0	0.50	0.0	0.00	0	0	0.00	0.00	0.00	0	13.12	0.9
<b>Count</b>		5	5	5	0	4	0	0	1	0	0	0	5	5

LWWMD Water Quality Data - 2009  
 ALI Customer No. 1157-03

Insitu Water Quality Data - Lake Wallenpaupack - All Stations  
 Prepared by Aqua Link, Inc.

Database Last Modified: 02/11/11  
 Staff Initials: arl

Insitu Water Quality Data - Station No. 5

Date M/D/Y	Time hh:mm:ss	Site	Depth m	Temp C	DO% %	DO Conc mg/L	Cond uS/cm	SpCond uS/cm	pH s.u.	TDS g/L	Salinity ppt	ORP mV	Conversions	
													Depth (feet)	Temp (Degrees F)
9/22/2009	13:19:00	5	0.00	19.59		10.1			8.11				0.00	67.3
9/22/2009	13:19:00	5	1.00	19.57		10.17							3.28	67.2
9/22/2009	13:19:00	5	2.00	19.53		10.14							6.56	67.2
9/22/2009	13:19:00	5	3.00	19.36		9.92							9.84	66.8
9/22/2009	13:19:00	5	4.00	18.91		9.59							13.12	66.0
9/22/2009	13:19:00	5	5.00	18.52		9.22							16.40	65.3
<<insert>>														
<b>Min</b>		5.0	0.0	18.52	0.0	9.22	0	0	8.11	0.00	0.00	0	0.00	65.3
<b>Max</b>		5.0	5.0	19.59	0.0	10.17	0	0	8.11	0.00	0.00	0	16.40	67.3
<b>Max - Min</b>		0.0	5.0	1.07	0.0	0.95	0	0	0.00	0.00	0.00	0	16.40	1.9
<b>Count</b>		6	6	6	0	6	0	0	1	0	0	0	6	6

LWWMD Water Quality Data - 2009  
 ALI Customer No. 1157-03

Insitu Water Quality Data - Lake Wallenpaupack - All Stations  
 Prepared by Aqua Link, Inc.

Database Last Modified: 02/11/11  
 Staff Initials: arl

Insitu Water Quality Data - Station No. 5

Date M/D/Y	Time hh:mm:ss	Site	Depth m	Temp C	DO% %	DO Conc mg/L	Cond uS/cm	SpCond uS/cm	pH s.u.	TDS g/L	Salinity ppt	ORP mV	Conversions	
													Depth (feet)	Temp (Degrees F)
10/13/2009	12:50:00	5	0.00	13.52		10.54			8.46				0.00	56.3
10/13/2009	12:50:00	5	1.00	13.52		10.31							3.28	56.3
10/13/2009	12:50:00	5	2.00	13.52		10.23							6.56	56.3
10/13/2009	12:50:00	5	3.00	13.5		10.13							9.84	56.3
10/13/2009	12:50:00	5	4.00	13.43		10.05							13.12	56.2
10/13/2009	12:50:00	5	5.00	13.21		10.03							16.40	55.8
10/13/2009	12:50:00	5	6.00	11.68		9.93							19.68	53.0
<<insert>>														
<b>Min</b>		5.0	0.0	11.68	0.0	9.93	0	0	8.46	0.00	0.00	0	0.00	53.0
<b>Max</b>		5.0	6.0	13.52	0.0	10.54	0	0	8.46	0.00	0.00	0	19.68	56.3
<b>Max - Min</b>		0.0	6.0	1.84	0.0	0.61	0	0	0.00	0.00	0.00	0	19.68	3.3
<b>Count</b>		7	7	7	0	7	0	0	1	0	0	0	7	7

LWWMD Water Quality Data - 2009  
 ALI Customer No. 1157-03

Insitu Water Quality Data - Lake Wallenpaupack - All Stations  
 Prepared by Aqua Link, Inc.

Database Last Modified: 02/11/11  
 Staff Initials: arl

Insitu Water Quality Data - Station No. 5

Date M/D/Y	Time hh:mm:ss	Site	Depth m	Temp C	DO% %	DO Conc mg/L	Cond uS/cm	SpCond uS/cm	pH s.u.	TDS g/L	Salinity ppt	ORP mV	Conversions	
													Depth (feet)	Temp (Degrees F)
10/27/2009	13:03:00	5	0.00	11.2		8.28			8.35				0.00	52.2
10/27/2009	13:03:00	5	1.00	11.2		8.35							3.28	52.2
10/27/2009	13:03:00	5	2.00	11		8.35							6.56	51.8
10/27/2009	13:03:00	5	3.00	10.9		8.35							9.84	51.6
10/27/2009	13:03:00	5	4.00	10.2		8.25							13.12	50.4
10/27/2009	13:03:00	5	5.00	9.9		8.18							16.40	49.8
<<insert>>														
<b>Min</b>		5.0	0.0	9.90	0.0	8.18	0	0	8.35	0.00	0.00	0	0.00	49.8
<b>Max</b>		5.0	5.0	11.20	0.0	8.35	0	0	8.35	0.00	0.00	0	16.40	52.2
<b>Max - Min</b>		0.0	5.0	1.30	0.0	0.17	0	0	0.00	0.00	0.00	0	16.40	2.3
<b>Count</b>		6	6	6	0	6	0	0	1	0	0	0	6	6

LWWMD Water Quality Data - 2008-09  
 ALI Customer No. 1157-03

Laboratory Water Quality Data - Lake Wallenpaupack - All Stations  
 Prepared by Aqua Link, Inc.

Database Last Modified: 02/11/11  
 Staff Initials: arl

Lab ID: Quan (Quantum Labs)

ECM (Environmental Compliance Monitoring Inc.)

Ref ID	Lab ID	Year	Date	Station	Layer Code	Layer Depth (m)	pH (s.u.)	ALK (mg/L)	SRP (mg/L)	TP (mg/L)	NO3 (mg/L)	NO2 (mg/L)	NO2/NO3 (mg/L)	NH3 (mg/L)	TKN (mg/L)	TN* (mg/L)	TSS (mg/L)	Ref ID
1	Quan	2008	03/31/08	3	1	s	6.90	9.5	b 0.010	b 0.010	b 1.000	b 0.010		b	1.000	2.010	b 2.0	1
2	Quan	2008	04/21/08	3	1	s	7.02	10.0	0.007	0.060	b 0.010	0.011			0.820	0.841	b 2.0	2
3	Quan	2008	04/21/08	3	3	b	6.91		0.006	0.070	b 0.010	0.039			0.630	0.679	b 2.0	3
4	Quan	2008	05/20/08	5	1	s	7.47	25.0	b 0.010	b 0.050	0.045	0.010		b	1.000	1.055	5.0	4
5	Quan	2008	05/20/08	3	1	s	7.48	10.0	0.010	b 0.050	0.016	b 0.010		b	1.000	1.026	b 2.0	5
6	Quan	2008	05/20/08	5	3	b	7.70		b 0.010	b 0.050	0.166	b 0.010		b	1.000	1.176	3.3	6
7	Quan	2008	05/20/08	3	3	b	7.42		b 0.010	b 0.050	0.137	b 0.010		b	1.000	1.147	6.0	7
8	Quan	2008	05/28/08	3	3	b	8.07		b 0.010	b 0.050	0.065	0.011		b	1.000	1.076	b 2.0	8
9	Quan	2008	05/28/08	3	1	s	7.51	15.0	b 0.010	b 0.050	b 0.010	b 0.010		b	1.000	1.020	b 2.0	9
10	Quan	2008	05/28/08	5	3	b	8.02		b 0.010	b 0.050	0.071	0.010		b	1.000	1.081	b 2.0	10
11	Quan	2008	05/28/08	5	1	s	7.58	20.0	b 0.010	b 0.050	0.053	b 0.010		b	1.000	1.063	b 2.0	11
12	Quan	2008	06/16/08	5	1	s	7.27	17.5	0.030	0.070	b 0.010	b 0.010		b	1.000	1.020	b 2.0	12
13	Quan	2008	06/16/08	3	1	s	7.13	15.0	b 0.010	0.030	b 0.010	b 0.010		b	1.000	1.020	b 2.0	13
14	Quan	2008	06/16/08	5	3	b	6.90		0.020	0.040	0.100	0.012		b	1.000	1.112	b 2.0	14
15	Quan	2008	06/16/08	3	3	b	7.04		0.010	0.050	0.056	0.023		b	1.000	1.079	b 2.0	15
16	Quan	2008	06/24/08	3	3	b	6.26		0.020	0.030	b 0.010	0.034		b	1.000	1.044	b 2.0	16
17	Quan	2008	06/24/08	5	3	b	6.62		0.030	0.010	0.020	0.017		b	1.000	1.037	b 2.0	17
18	Quan	2008	06/24/08	5	1	s	7.15	12.5	b 0.010	0.030	b 0.010	b 0.010		b	1.000	1.020	b 2.0	18
19	Quan	2008	07/08/08	3	3	b	6.49		0.010	0.010	0.037	b 0.010			1.150	1.197	2.0	19
20	Quan	2008	07/08/08	5	3	b	7.10		0.010	0.010	0.030	b 0.010		b	1.000	1.040	3.0	20
21	Quan	2008	07/08/08	3	1	s	7.43	15.0	0.010	0.020	b 0.010	b 0.010		b	1.000	1.020	b 2.0	21
22	Quan	2008	07/08/08	5	1	s	7.26	20.0	0.020	0.020	0.129	0.053		b	1.000	1.182	b 2.0	22
23	Quan	2008	07/22/08	3	3	b	7.22		0.030	0.040	b 0.010	b 0.010		b	1.000	1.020	b 2.0	23
24	Quan	2008	07/22/08	3	1	s	7.87	20.0	b 0.010	b 0.010	b 0.010	b 0.010		b	1.000	1.020	b 2.0	24
25	Quan	2008	07/22/08	5	3	b	7.63		b 0.010	b 0.010	b 0.010	0.012		b	1.000	1.022	b 2.0	25
26	Quan	2008	07/22/08	5	1	s	7.76	20.0	0.020	0.020	0.173	0.046		b	1.000	1.219	b 2.0	26
27	Quan	2008	08/08/08	3	1	s	7.12	20.0	b 0.010	0.010	b 0.010	0.027		b	1.000	1.037	b 2.0	27
28	Quan	2008	08/08/08	3	3	b	6.51		0.070	0.110	0.061	b 0.010		b	1.000	1.071	b 2.0	28
29	Quan	2008	08/08/08	5	1	s	7.13	20.0	0.010	0.020	0.266	b 0.010		b	1.000	1.276	4.5	29
30	Quan	2008	08/08/08	5	3	b	6.90		0.090	0.090	0.229	b 0.010		b	1.000	1.239	14.0	30
31	Quan	2008	08/25/08	3	1	s	7.20	20.0	b 0.010	0.010	b 0.010	b 0.010		b	1.000	1.020	2.0	31

LWWMD Water Quality Data - 2008-09  
 ALI Customer No. 1157-03

Laboratory Water Quality Data - Lake Wallenpaupack - All Stations  
 Prepared by Aqua Link, Inc.

Database Last Modified: 02/11/11  
 Staff Initials: arl

Lab ID: Quan (Quantum Labs)

ECM (Environmental Compliance Monitoring Inc.)

Ref ID	Lab ID	Year	Date	Station	Layer Code	Layer Depth (m)	pH (s.u.)	ALK (mg/L)	SRP (mg/L)	TP (mg/L)	NO3 (mg/L)	NO2 (mg/L)	NO2/NO3 (mg/L)	NH3 (mg/L)	TKN (mg/L)	TN* (mg/L)	TSS (mg/L)	Ref ID
1	Quan	2008	03/31/08	3	1	s	6.90	9.5	b 0.010	b 0.010	b 1.000	b 0.010		b	1.000	2.010	b 2.0	1
2	Quan	2008	04/21/08	3	1	s	7.02	10.0	0.007	0.060	b 0.010	0.011			0.820	0.841	b 2.0	2
3	Quan	2008	04/21/08	3	3	b	6.91		0.006	0.070	b 0.010	0.039			0.630	0.679	b 2.0	3
4	Quan	2008	05/20/08	5	1	s	7.47	25.0	b 0.010	b 0.050	0.045	0.010		b	1.000	1.055	5.0	4
32	Quan	2008	08/25/08	3	3	b	7.12		0.010	0.050	b 0.010	b 0.010		b	1.000	1.020	3.6	32
33	Quan	2008	08/25/08	5	1	s	7.12	20.0	b 0.010	0.010	0.409	0.335		b	1.000	1.744	b 2.0	33
34	Quan	2008	08/25/08	5	3	b	6.91		b 0.010	0.010	0.102	b 0.010		b	1.000	1.112	b 2.0	34
35	Quan	2008	09/16/08	5	3	b	7.02		b 0.010	0.060	0.043	b 0.010		b	1.000	1.053	28.0	35
36	Quan	2008	09/16/08	5	1	s	7.16	14.0	b 0.010	0.030	0.543	0.234		b	1.000	1.777	b 2.0	36
37	Quan	2008	09/16/08	3	1	s	7.08	14.0	b 0.010	b 0.010	b 0.010	b 0.010		b	1.000	1.020	b 2.0	37
38	Quan	2008	09/16/08	3	3	b	7.11		0.070	0.130	b 0.010	b 0.010		b	1.000	1.020	b 2.0	38
39	Quan	2008	09/29/08	3	3	b	7.09		0.090	0.170	b 0.010	b 0.010		b	1.000	1.020	b 2.0	39
40	Quan	2008	09/29/08	3	1	s	7.00	14.0	b 0.010	b 0.010	b 0.010	b 0.010		b	1.000	1.020	b 2.0	40
41	Quan	2008	09/29/08	5	3	b	7.10		b 0.010	0.070	0.044	b 0.010		b	1.000	1.054	b 2.0	41
42	Quan	2008	09/29/08	5	1	s	7.00	17.0	b 0.010	0.050	0.611	0.145		b	1.000	1.756	b 2.0	42
43	Quan	2008	10/14/08	3	1	s	6.84	15.0	b 0.010	0.050	0.146	0.076		b	1.000	1.222	b 2.0	43
44	Quan	2008	10/14/08	3	3	b	6.11		0.040	0.080	0.451	b 0.010		b	1.000	1.461	2.0	44
45	Quan	2008	10/14/08	5	1	s	6.99	20.0	b 0.010	0.060	b 0.010	b 0.010		b	1.000	1.020	b 2.0	45
46	Quan	2008	10/14/08	5	3	b	5.98		0.040	0.130	0.087	b 0.010		b	1.000	1.097	24.8	46
47	Quan	2008	10/30/08	3	1	s	7.22	15.0	b 0.010	b 0.010	0.019	b 0.010		b	1.000	1.029	b 2.0	47
48	Quan	2008	10/30/08	3	3	b	6.17		b 0.010	b 0.010	0.021	b 0.010		b	1.000	1.031	b 2.0	48
49	Quan	2008	10/30/08	5	1	s	6.81	13.0	b 0.010	b 0.010	0.085	b 0.010		b	1.000	1.095	b 2.0	49
50	Quan	2008	10/30/08	5	3	b	6.02		b 0.010	b 0.010	0.087	b 0.010		b	1.000	1.097	b 2.0	50
51	Quan	2008	11/21/08	3	1	s	7.05	15.0	b 0.010	b 0.010	0.160	b 0.010		b	1.000	1.170	b 2.0	51
52	Quan	2008	11/21/08	3	3	b	7.18		b 0.010	b 0.010	0.216	b 0.010		b	1.000	1.226	b 2.0	52
53	Quan	2009	03/27/09	3	1	s			b 0.020	b 0.020	0.020	0.012		b	1.000	1.032	b 2.0	53
54	Quan	2009	03/27/09	3	3	b			b 0.020	b 0.020	0.220	0.011		b 0.500	b 1.000	1.231	b 2.0	54
55	Quan	2009	04/21/09	3	1	s			b 0.020	b 0.020							6.0	55
56	Quan	2009	04/21/09	3	3	b			b 0.020	b 0.020				b 0.500			4.0	56
57	Quan	2009	05/13/09	5	1	s			b 0.020	b 0.020							b 2.0	57
58	Quan	2009	05/13/09	4	1	s			b 0.020	b 0.020							b 2.0	58

LWWMD Water Quality Data - 2008-09  
 ALI Customer No. 1157-03

Laboratory Water Quality Data - Lake Wallenpaupack - All Stations  
 Prepared by Aqua Link, Inc.

Database Last Modified: 02/11/11  
 Staff Initials: arl

Lab ID: Quan (Quantum Labs) ECM (Environmental Compliance Monitoring Inc.)

Ref ID	Lab ID	Year	Date	Station	Layer Code	Layer	Depth (m)	pH (s.u.)	ALK (mg/L)	SRP (mg/L)	TP (mg/L)	NO3 (mg/L)	NO2 (mg/L)	NO2/NO3 (mg/L)	NH3 (mg/L)	TKN (mg/L)	TN* (mg/L)	TSS (mg/L)	Ref ID
1	Quan	2008	03/31/08	3	1	s		6.90	9.5	b 0.010	b 0.010	b 1.000	b 0.010		b	1.000	2.010	b 2.0	1
2	Quan	2008	04/21/08	3	1	s		7.02	10.0	0.007	0.060	b 0.010	0.011			0.820	0.841	b 2.0	2
3	Quan	2008	04/21/08	3	3	b		6.91		0.006	0.070	b 0.010	0.039			0.630	0.679	b 2.0	3
4	Quan	2008	05/20/08	5	1	s		7.47	25.0	b 0.010	b 0.050	0.045	0.010		b	1.000	1.055	5.0	4
59	Quan	2009	05/13/09	5	3	b				b 0.020	b 0.020			b 0.500				b 2.0	59
60	Quan	2009	05/13/09	3	1	s				b 0.020	b 0.020							2.5	60
61	Quan	2009	05/13/09	4	3	b				b 0.020	b 0.020			b 0.500				b 2.0	61
62	Quan	2009	05/26/09	5	3	b				b 0.020	b 0.020			b 0.500				b 2.0	62
63	Quan	2009	05/26/09	5	1	s				b 0.020	b 0.020							b 2.0	63
64	Quan	2009	05/26/09	3	1	s				b 0.020	b 0.020							2.0	64
65	Quan	2009	05/26/09	4	3	b				b 0.020	b 0.020			b 0.500				b 2.0	65
66	Quan	2009	05/26/09	4	1	s				b 0.020	b 0.020							b 2.0	66
67	Quan	2009	05/26/09	3	3	b				b 0.020	b 0.020			b 0.500				2.0	67
68	Quan	2009	06/09/09	3	1	s				b 0.010	b 0.010							b 2.0	68
69	Quan	2009	06/09/09	3	3	b				b 0.010	b 0.010			b 0.500				b 2.0	69
70	Quan	2009	06/09/09	4	1	s				b 0.010	0.010							b 2.0	70
71	Quan	2009	06/09/09	4	3	b				b 0.010	b 0.010			b 0.500				b 2.0	71
72	Quan	2009	06/09/09	5	1	s				b 0.010	b 0.010							b 2.0	72
73	Quan	2009	06/09/09	5	3	b				b 0.010	0.020			b 0.500				b 2.0	73
74	Quan	2009	06/23/09	3	1	s				b 0.010	b 0.010							b 2.0	74
75	Quan	2009	06/23/09	3	3	b				b 0.010	b 0.010			b 0.500				b 2.0	75
76	Quan	2009	06/23/09	4	1	s				b 0.010	b 0.010							b 2.0	76
77	Quan	2009	06/23/09	4	3	b				b 0.010	b 0.010			b 0.500				6.0	77
78	Quan	2009	06/23/09	5	1	s				b 0.010	b 0.010							b 2.0	78
79	Quan	2009	06/23/09	5	3	b				b 0.010	b 0.010			b 0.500				b 2.0	79
80	Quan	2009	07/09/09	3	1	s				0.010	0.010							b 2.0	80
81	Quan	2009	07/09/09	3	3	b				0.030	0.040			b 0.500				6.0	81
82	Quan	2009	07/09/09	4	1	s				0.010	0.010							b 2.0	82
83	Quan	2009	07/09/09	4	3	b				b 0.010	0.010			b 0.500				3.2	83
84	Quan	2009	07/09/09	5	1	s				0.020	0.030							2.8	84
85	Quan	2009	07/09/09	5	3	b				0.010	0.030			b 0.500				4.0	85

LWWMD Water Quality Data - 2008-09  
 ALI Customer No. 1157-03

Laboratory Water Quality Data - Lake Wallenpaupack - All Stations  
 Prepared by Aqua Link, Inc.

Database Last Modified: 02/11/11  
 Staff Initials: arl

Lab ID: Quan (Quantum Labs) ECM (Environmental Compliance Monitoring Inc.)

Ref ID	Lab ID	Year	Date	Station	Layer Code	Layer Depth (m)	pH (s.u.)	ALK (mg/L)	SRP (mg/L)	TP (mg/L)	NO3 (mg/L)	NO2 (mg/L)	NO2/NO3 (mg/L)	NH3 (mg/L)	TKN (mg/L)	TN* (mg/L)	TSS (mg/L)	Ref ID
1	Quan	2008	03/31/08	3	1	s	6.90	9.5	b 0.010	b 0.010	b 1.000	b 0.010		b	1.000	2.010	b 2.0	1
2	Quan	2008	04/21/08	3	1	s	7.02	10.0	0.007	0.060	b 0.010	0.011			0.820	0.841	b 2.0	2
3	Quan	2008	04/21/08	3	3	b	6.91		0.006	0.070	b 0.010	0.039			0.630	0.679	b 2.0	3
4	Quan	2008	05/20/08	5	1	s	7.47	25.0	b 0.010	b 0.050	0.045	0.010		b	1.000	1.055	5.0	4
86	Quan	2009	07/30/09	3	1	s			b 0.010	0.060							2.0	86
87	Quan	2009	07/30/09	3	3	b			0.070	0.070			b 0.500				2.8	87
88	Quan	2009	07/30/09	4	1	s			b 0.010	0.010							2.4	88
89	Quan	2009	07/30/09	4	3	b			0.020	0.030			b 0.500				2.6	89
90	Quan	2009	07/30/09	5	1	s			b 0.010	0.010							2.0	90
91	Quan	2009	07/30/09	5	3	b			b 0.010	0.030			b 0.500				4.6	91
92	Quan	2009	08/20/09	3	1	s			0.019	0.040							2.4	92
93	Quan	2009	08/20/09	3	3	b			0.017	0.033			b 0.050			b	2.0	93
94	Quan	2009	08/20/09	4	1	s			b 0.010	0.022							3.3	94
95	Quan	2009	08/20/09	4	3	b			b 0.010	0.030			b 0.500				3.4	95
96	Quan	2009	08/20/09	5	1	s			b 0.010	b 0.010							2.0	96
97	Quan	2009	08/20/09	5	3	b			b 0.010	0.041			b 0.500				3.2	97
98	Quan	2009	08/31/09	3	1	s			b 0.010	b 0.010						b	2.0	98
99	Quan	2009	08/31/09	3	3	b			0.054	0.287			b 0.500				7.3	99
100	Quan	2009	08/31/09	4	1	s			b 0.010	0.023							3.2	100
101	Quan	2009	08/31/09	4	3	b			0.014	0.023			b 0.500				3.2	101
102	Quan	2009	08/31/09	5	1	s			0.012	0.044							3.6	102
103	Quan	2009	08/31/09	5	3	b			0.033	0.036			b 0.500				3.6	103
104	Quan	2009	09/22/09	3	1	s			0.030	0.070							3.2	104
105	Quan	2009	09/22/09	3	3	b			0.050	0.120			1.110				8.0	105
106	Quan	2009	09/22/09	4	1	s			0.050	0.100							4.0	106
107	Quan	2009	09/22/09	4	3	b			0.020	0.070			b 0.500				3.6	107
108	Quan	2009	09/22/09	5	1	s			0.050	0.060							6.4	108
109	Quan	2009	09/22/09	5	3	b			0.050	0.050			b 0.500				4.4	109
110	Quan	2009	10/13/09	3	1	s			b 0.010	0.058							2.0	110
111	Quan	2009	10/13/09	3	3	b			b 0.010	0.015			b 0.500				3.0	111



LWWMD Water Quality Data - 2008-09  
ALI Customer No. 1157-03

Laboratory Water Quality Data - Lake Wallenpaupack - All Stations  
Prepared by Aqua Link, Inc.

Database Last Modified: 02/11/11  
Staff Initials: arl

Lab ID: Quan (Quantum Labs) ECM (Environmental Compliance Monitoring Inc.)

Ref ID	Lab ID	Year	Date	Station	Layer Code	Layer Depth (m)	pH (s.u.)	ALK (mg/L)	SRP (mg/L)	TP (mg/L)	NO3 (mg/L)	NO2 (mg/L)	NO2/NO3 (mg/L)	NH3 (mg/L)	TKN (mg/L)	TN* (mg/L)	TSS (mg/L)	Ref ID	
1	Quan	2008	03/31/08	3	1	s	6.90	9.5	b 0.010	b 0.010	b 1.000	b 0.010		b	1.000	2.010	b 2.0	1	
2	Quan	2008	04/21/08	3	1	s	7.02	10.0	0.007	0.060	b 0.010	0.011			0.820	0.841	b 2.0	2	
3	Quan	2008	04/21/08	3	3	b	6.91		0.006	0.070	b 0.010	0.039			0.630	0.679	b 2.0	3	
4	Quan	2008	05/20/08	5	1	s	7.47	25.0	b 0.010	b 0.050	0.045	0.010		b	1.000	1.055	5.0	4	
112	Quan	2009	10/13/09	4	1	s			0.011	0.085								2.6	112
113	Quan	2009	10/13/09	4	3	b			b 0.010	0.045			b	0.500				3.0	113
114	Quan	2009	10/13/09	5	1	s			b 0.010	0.018								2.8	114
115	Quan	2009	10/13/09	5	3	b			b 0.010	0.075			b	0.500				4.0	115
116	Quan	2009	10/27/09	3	1	s			b 0.010	0.052								2.6	116
117	Quan	2009	10/27/09	3	3	b			b 0.010	0.062				b	0.500			2.3	117
118	Quan	2009	10/27/09	4	1	s			b 0.010	0.018								3.0	118
119	Quan	2009	10/27/09	4	3	b			b 0.010	b 0.010				b	0.500			2.6	119
120	Quan	2009	10/27/09	5	1	s			b 0.010	0.038								5.3	120
121	Quan	2009	10/27/09	5	3	b			b 0.010	b 0.010				b	0.500			2.6	121
122	Quan	2009	11/12/09	3	1	s			0.010	0.010								2.0	122
123	Quan	2009	11/12/09	3	3	b			0.010	0.010				0.620			b	2.0	123

<insert>

**Notes:**  
TUP (total unfiltered phosphorus) same as total phosphorus  
DOP (dissolved orthophosphorus) same as FOP (filtered orthophosphorus)  
NO2/NO3 (nitrate + nitrite nitrogen) can be determined directly by laboratory or by summing nitrate & nitrite concentrations

LWWMD Water Quality Data - 2008-09  
 ALI Customer No. 1157-03

Secchi Depth & Lab Chla Data - Lake Wallenpaupack - All Stations  
 Prepared by Aqua Link, Inc.

Database Last Modified: 02/11/11  
 Staff Initials: arl

Lab ID: Quant (Quantum Labs)  
 ECM (Environmental Compliance Monitoring Inc.)

Ref	Lab	Year	Date	Station	Secchi Depth (m)	Sampling Depth (m)	Chlorophyll a (ug/L)	Pheophytin (ug/L)	Ref
1	Quant	2008	3/31/08	3	2.15		4.60	2.60	1
2	Quant	2008	4/21/08	3	2.50		12.40	25.80	2
3	Quant	2008	5/20/08	3	2.30		20.20	17.30	3
4	Quant	2008	5/20/08	5	1.73		9.37	9.04	4
5	Quant	2008	5/28/08	3	2.45		23.90	11.50	5
6	Quant	2008	5/28/08	5	1.80		13.00	2.67	6
7	Quant	2008	6/8/08	3	3.00				7
8	Quant	2008	6/16/08	3	2.75		2.40	18.47	8
9	Quant	2008	6/16/08	5	1.60		5.40	27.86	9
10	Quant	2008	6/24/08	3	3.00				10
11	Quant	2008	6/24/08	5	2.00		10.47	35.26	11
12	Quant	2008	7/8/08	3	3.00		2.00	15.90	12
13	Quant	2008	7/8/08	5	2.60		1.10	30.80	13
14	Quant	2008	7/22/08	3	2.10		5.60	6.20	14
15	Quant	2008	7/22/08	5	1.35		16.40	11.80	15
16	Quant	2008	8/8/08	3	1.30		11.30	52.90	16
17	Quant	2008	8/8/08	5	1.00		24.00	12.10	17
18	Quant	2008	8/25/08	3	1.40		13.70	10.40	18
19	Quant	2008	8/25/08	5	1.00		5.61	47.70	19
20	Quant	2008	9/16/08	3	1.55		13.50	7.76	20
21	Quant	2008	9/16/08	5	1.30		16.88	10.60	21
22	Quant	2008	9/29/08	3	2.00		10.08	8.61	22
23	Quant	2008	9/29/08	5	1.70		14.76	5.34	23
24	Quant	2008	10/14/08	3	1.60		21.31	3.61	24
25	Quant	2008	10/14/08	5	1.60		25.63	2.80	25
26	Quant	2008	10/30/08	3	1.80		7.16	8.26	26
27	Quant	2008	10/30/08	5	1.60		2.68	0.81	27
28	Quant	2008	11/21/08	3	1.85		12.11	3.88	28

LWWMD Water Quality Data - 2008-09  
 ALI Customer No. 1157-03

Secchi Depth & Lab Chla Data - Lake Wallenpaupack - All Stations  
 Prepared by Aqua Link, Inc.

Database Last Modified: 02/11/11  
 Staff Initials: arl

Lab ID: Quant (Quantum Labs)  
 ECM (Environmental Compliance Monitoring Inc.)

Ref	Lab	Year	Date	Station	Secchi Depth (m)	Sampling Depth (m)	Chlorophyll a (ug/L)	Pheophytin (ug/L)	Ref
29	Quant	2009	3/26/09	3	2.50		4.31	1.54	29
30	Quant	2009	4/21/09	3	2.50		5.61	3.18	30
31	Quant	2009	5/13/09	3	2.00		11.06	6.12	31
32	Quant	2009	5/13/09	4	2.00		14.02	2.40	32
33	Quant	2009	5/13/09	5	2.10		8.01	11.80	33
34	Quant	2009	5/26/09	3	2.30		4.54	9.67	34
35	Quant	2009	5/26/09	4	2.30		5.87	6.28	35
36	Quant	2009	5/26/09	5	1.70		5.10	4.29	36
37	Quant	2009	6/9/09	3	2.90		7.28	4.83	37
38	Quant	2009	6/9/09	4	3.00		3.74	0.19	38
39	Quant	2009	6/9/09	5	2.20		3.20	3.71	39
40	Quant	2009	6/23/09	3	2.30		5.87	6.27	40
41	Quant	2009	6/23/09	4	2.20		5.07	4.65	41
42	Quant	2009	6/23/09	5	2.00		5.90	6.12	42
43	Quant	2009	7/9/09	3	2.90		6.44	25.04	43
44	Quant	2009	7/9/09	4	2.40		6.17	6.04	44
45	Quant	2009	7/9/09	5	1.70		7.74	13.56	45
46	Quant	2009	7/30/09	3	2.30		6.47	11.08	46
47	Quant	2009	7/30/09	4	2.30		3.51	28.05	47
48	Quant	2009	7/30/09	5	1.50		4.54	30.14	48
49	Quant	2009	8/20/09	3	2.10		8.86	37.41	49
50	Quant	2009	8/20/09	4	1.90		11.87	46.79	50
51	Quant	2009	8/20/09	5	1.60		16.64	7.41	51
52	Quant	2009	8/31/09	3	1.80		5.87	23.28	52
53	Quant	2009	8/31/09	4	1.70		10.79	22.82	53
54	Quant	2009	8/31/09	5	1.40		18.33	24.44	54
55	Quant	2009	9/22/09	3	1.70		21.60	6.41	55
56	Quant	2009	9/22/09	4	1.50		16.30	3.52	56
57	Quant	2009	9/22/09	5	1.10		46.10	2.78	57
58	Quant	2009	10/13/09	3	1.70		13.88	2.56	58
59	Quant	2009	10/13/09	4	1.40		21.31	2.48	59
60	Quant	2009	10/13/09	5	1.20		28.04	4.11	60
61	Quant	2009	10/27/09	3	2.00		13.48	4.07	61
62	Quant	2009	10/27/09	4	2.00		10.15	4.43	62
63	Quant	2009	10/27/09	5	1.00		6.68	3.04	63
64	Quant	2009	11/12/09	3	2.90		10.52	1.19	64

Carlson's Trophic State Index

Station	Date	Secchi (meters)	Chl-a* (ug/l)	TP* (mg/l as P)	TSI Values			Mean TSI Values		
					Secchi	Chl-a	TP	Secchi	Chl-a	TP
3	5/20/08	2.30	20.20	0.050	48.0	60.1	60.6	48.8	54.9	49.8
3	5/28/08	2.45	23.90	0.050	47.1	61.7	60.6			
3	6/8/08	3.00			44.2					
3	6/16/08	2.75	2.40	0.030	45.4	39.2	53.2			
3	6/24/08	3.00			44.2					
3	7/8/08	3.00	2.00	0.020	44.2	37.4	47.4			
3	7/22/08	2.10	5.60	0.010	49.3	47.5	37.4			
3	8/8/08	1.30	11.30	0.010	56.2	54.4	37.4			
3	8/25/08	1.40	13.70	0.010	55.1	56.2	37.4			
3	9/16/08	1.55	13.50	0.010	53.7	56.1	37.4			
3	9/29/08	2.00	10.08	0.010	50.0	53.2	37.4			
3	10/14/08	1.60	21.31	0.050	53.2	60.6	60.6			
3	10/30/08	1.80	7.16	0.010	51.5	49.9	37.4			
<<insert>>										
	<b>Min</b>	1.30	2.00	0.010	44.2	37.4	37.4			
	<b>Max</b>	3.00	23.90	0.050	56.2	61.7	60.6			
	<b>Mean</b>	2.17	11.92	0.024	-----	-----	-----			
	<b>Median</b>	2.10	11.30	0.010	-----	-----	-----			
	<b>Stds</b>	0.63	7.49	0.018	-----	-----	-----			
	<b>Std</b>	0.60	7.14	0.017	-----	-----	-----			
	<b>Count</b>	13	11	11	13	11	11			

**Note(s):** (\*) indicates data reported for surface (1.0 m)

Carlson's Trophic State Index

Station	Date	Secchi (meters)	Chl-a* (ug/l)	TP* (mg/l as P)	TSI Values			Mean TSI Values		
					Secchi	Chl-a	TP	Secchi	Chl-a	TP
3	5/13/09	2.00	11.06	0.020	50.0	54.1	47.4	48.7	52.7	54.5
3	5/26/09	2.30	4.54	0.020	48.0	45.4	47.4			
3	6/9/09	2.90	7.28	0.010	44.6	50.0	37.4			
3	6/23/09	2.30	5.87	0.010	48.0	47.9	37.4			
3	7/9/09	2.90	6.44	0.010	44.6	48.8	37.4			
3	7/30/09	2.30	6.47	0.060	48.0	48.9	63.2			
3	8/20/09	2.10	8.86	0.040	49.3	52.0	57.4			
3	8/31/09	1.80	5.87	0.010	51.5	47.9	37.4			
3	9/22/09	1.70	21.60	0.070	52.3	60.7	65.4			
3	10/13/09	1.70	13.88	0.058	52.3	56.4	62.7			
3	10/27/09	2.00	13.48	0.052	50.0	56.1	61.2			
<<insert>>										
	<b>Min</b>	1.70	4.54	0.010	44.6	45.4	37.4			
	<b>Max</b>	2.90	21.60	0.070	52.3	60.7	65.4			
	<b>Mean</b>	2.18	9.58	0.033	-----	-----	-----			
	<b>Median</b>	2.10	7.28	0.020	-----	-----	-----			
	<b>Stds</b>	0.42	5.09	0.024	-----	-----	-----			
	<b>Std</b>	0.40	4.85	0.023	-----	-----	-----			
	<b>Count</b>	11	11	11	11	11	11			

**Note(s):** (\*) indicates data reported for surface (1.0 m)

Database Last Modified: 02/14/11  
 Staff Initials: arl

Date	Station	Total Density (cells/mL)	Bacillariophyta	Chlorophyta	Chrysophyta	Cryptophyta	Cyanophyta	Euglenophyta	Pyrrhophyta	Rhodophyta
03/31/08	3	3,832.0	2174.0	145.0	129.0	370.0	998.0	16.0	0.0	0.0
05/20/08	3	7,392.7	3255.0	2427.5	993.0	441.4	0.0	0.0	275.8	0.0
05/28/08	3	4,637.6	3176.4	540.0	476.5	63.5	0.0	0.0	381.2	0.0
06/16/08	3	6,853.7	4864.8	215.0	0.0	188.1	1558.9	26.9	0.0	0.0
06/24/08	3	1,845.8	922.9	666.5	0.0	51.3	0.0	0.0	205.1	0.0
07/09/08	3	3,506.0	0.0	1979.2	0.0	113.1	1413.7	0.0	0.0	0.0
07/22/08	3	11,515.6	0.0	1712.6	0.0	0.0	9684.9	0.0	118.1	0.0
08/08/08	3	25,672.2	735.6	1471.2	0.0	73.6	23391.8	0.0	0.0	0.0
08/25/08	3	15,074.5	199.7	3194.6	0.0	199.7	11380.7	0.0	99.8	0.0
09/16/08	3	4,936.5	874.8	2062.1	0.0	0.0	1874.6	62.5	62.5	0.0
09/29/08	3	3,389.0	1729.1	1106.6	0.0	345.8	0.0	138.3	69.2	0.0
10/14/08	3	5,395.2	2081.0	2774.7	0.0	539.5	0.0	0.0	0.0	0.0
10/30/08	3	1,269.8	517.3	752.5	0.0	0.0	0.0	0.0	0.0	0.0
11/21/08	3	1,694.1	529.4	1005.9	0.0	105.9	0.0	0.0	52.9	0.0
05/20/08	5	2,846.4	1138.6	759.1	759.1	189.8	0.0	0.0	0.0	0.0
05/28/08	5	8,184.2	7176.3	282.2	80.6	443.5	0.0	0.0	201.6	0.0
06/16/08	5	7,428.6	4182.5	437.0	0.0	0.0	2497.0	62.4	249.7	0.0
06/24/08	5	3,619.7	2205.8	1187.7	113.1	0.0	0.0	0.0	113.1	0.0
07/09/08	5	4,908.1	0.0	1689.7	0.0	0.0	2977.0	160.9	80.5	0.0
07/22/08	5	35,473.0	0.0	13626.8	1297.8	108.1	20440.3	0.0	0.0	0.0
08/08/08	5	49,747.4	670.2	3814.8	0.0	154.7	45004.6	0.0	103.1	0.0
08/25/08	5	18,954.4	0.0	806.6	0.0	403.3	17744.5	0.0	0.0	0.0
09/16/08	5	4,996.6	192.2	2498.3	0.0	768.7	1441.3	0.0	96.1	0.0
09/29/08	5	1,721.4	0.0	1398.6	0.0	161.4	0.0	161.4	0.0	0.0
10/14/08	5	9,190.4	1052.3	3858.6	841.9	912.0	2525.6	0.0	0.0	0.0
10/30/08	5	630.6	63.1	504.4	0.0	63.1	0.0	0.0	0.0	0.0

Database Last Modified: 02/14/11  
 Staff Initials: arl

Date	Station	Total Density (cells/mL)	Bacillariophyta	Chlorophyta	Chrysophyta	Cryptophyta	Cyanophyta	Euglenophyta	Pyrrhophyta	Rhodophyta
03/27/09	3	6,534.0	5724.0	432.0	54.0	216.0	0.0	108.0	0.0	0.0
04/21/09	3	36,828.0	4224.0	198.0	660.0	0.0	31680.0	0.0	66.0	0.0
05/13/09	3	144,900.0	7320.0	120.0	3060.0	420.0	133800.0	0.0	180.0	0.0
05/26/09	3	321,540.0	3960.0	660.0	540.0	180.0	316200.0	0.0	0.0	0.0
06/09/09	3	4,422.0	3366.0	594.0	198.0	198.0	0.0	0.0	66.0	0.0
06/23/09	3	4,815.0	2745.0	180.0	315.0	630.0	900.0	0.0	45.0	0.0
07/09/09	3	18,000.0	3360.0	660.0	0.0	180.0	13800.0	0.0	0.0	0.0
07/31/09	3	25,398.0	2601.0	816.0	765.0	153.0	20910.0	102.0	51.0	0.0
08/20/09	3	2,220.0	1380.0	420.0	60.0	180.0	0.0	120.0	60.0	0.0
08/31/09	3	55,104.0	1472.0	832.0	0.0	192.0	52480.0	128.0	0.0	0.0
09/22/09	3	25,296.0	3216.0	720.0	144.0	0.0	21120.0	96.0	0.0	0.0
10/18/09	3	49,114.0	1066.0	442.0	130.0	52.0	47320.0	104.0	0.0	0.0
10/27/09	3	11,178.0	1296.0	27.0	0.0	54.0	9720.0	81.0	0.0	0.0
11/12/09	3	5,980.0	1222.0	338.0	0.0	442.0	3900.0	78.0	0.0	0.0
05/13/09	4	61,452.0	6696.0	432.0	1566.0	324.0	52380.0	0.0	54.0	0.0
05/26/09	4	78,840.0	4980.0	1200.0	420.0	240.0	72000.0	0.0	0.0	0.0
06/09/09	4	6,300.0	3240.0	480.0	480.0	300.0	1800.0	0.0	0.0	0.0
06/23/09	4	6,300.0	3450.0	300.0	150.0	450.0	1875.0	75.0	0.0	0.0
07/09/09	4	4,260.0	3180.0	600.0	0.0	300.0	0.0	60.0	120.0	0.0
07/31/09	4	30,942.0	2106.0	1350.0	162.0	162.0	27000.0	108.0	54.0	0.0
08/20/09	4	3,300.0	1920.0	1020.0	60.0	120.0	0.0	120.0	60.0	0.0
08/31/09	4	41,460.0	1860.0	1500.0	120.0	120.0	37800.0	60.0	0.0	0.0
09/22/09	4	82,800.0	3780.0	360.0	300.0	180.0	78000.0	120.0	60.0	0.0
10/13/09	4	17,204.0	1258.0	340.0	34.0	34.0	15470.0	68.0	0.0	0.0
10/27/09	4	6,264.0	756.0	486.0	0.0	81.0	4860.0	81.0	0.0	0.0

Database Last Modified: 02/14/11  
 Staff Initials: arl

Date	Station	Total Density (cells/mL)	Bacillariophyta	Chlorophyta	Chrysophyta	Cryptophyta	Cyanophyta	Euglenophyta	Pyrrhophyta	Rhodophyta
05/13/09	5	78,126.0	5742.0	232.0	870.0	464.0	70760.0	0.0	58.0	0.0
05/26/09	5	4,200.0	3225.0	375.0	450.0	150.0	0.0	0.0	0.0	0.0
06/09/09	5	4,620.0	3600.0	240.0	300.0	480.0	0.0	0.0	0.0	0.0
06/23/09	5	3,540.0	1980.0	120.0	540.0	240.0	600.0	0.0	60.0	0.0
07/09/09	5	13,860.0	6600.0	960.0	60.0	180.0	6000.0	60.0	0.0	0.0
07/31/09	5	4,104.0	1944.0	1080.0	288.0	216.0	0.0	432.0	144.0	0.0
08/20/09	5	2,232.0	1800.0	144.0	0.0	144.0	0.0	144.0	0.0	0.0
08/31/09	5	4,500.0	1320.0	600.0	60.0	0.0	2400.0	120.0	0.0	0.0
09/22/09	5	102,284.0	2964.0	728.0	208.0	208.0	97968.0	208.0	0.0	0.0
10/13/09	5	13,900.0	940.0	240.0	0.0	80.0	12600.0	40.0	0.0	0.0
10/27/09	5	15,000.0	450.0	270.0	60.0	90.0	14100.0	30.0	0.0	0.0



LWWMD Water Quality  
 ALI Customer No. 115

Database Last Modified:

Staff Initials:

Date	Station	Total Biomass								
		(ug/L)	Bacillariophyta	Chlorophyta	Chrysophyta	Cryptophyta	Cyanophyta	Euglenophyta	Pyrrhophyta	Rhodophyta
03/31/08	3	5,401.7	4952.3	13.8	109.5	171.9	58.5	95.8	0.0	0.0
05/20/08	3	11,074.4	8280.7	390.9	334.5	427.2	0.0	0.0	1641.1	0.0
05/28/08	3	10,019.6	7201.3	257.2	231.9	61.5	0.0	0.0	2267.7	0.0
06/16/08	3	14,343.4	10027.6	337.7	0.0	182.1	3715.9	80.1	0.0	0.0
06/24/08	3	3,119.5	1761.0	87.1	0.0	51.3	0.0	0.0	1220.1	0.0
07/09/08	3	3,835.4	0.0	356.2	0.0	109.4	3369.8	0.0	0.0	0.0
07/22/08	3	24,495.3	0.0	526.5	0.0	0.0	23086.0	0.0	882.8	0.0
08/08/08	3	53,085.8	2024.0	899.0	0.0	71.2	50091.6	0.0	0.0	0.0
08/25/08	3	30,440.9	600.2	1621.0	0.0	193.2	27128.0	0.0	898.5	0.0
09/16/08	3	7,987.0	2629.6	330.9	0.0	0.0	4468.5	186.2	371.8	0.0
09/29/08	3	6,295.1	5021.3	115.4	0.0	334.7	0.0	412.2	411.5	0.0
10/14/08	3	14,974.8	6255.4	8197.3	0.0	522.1	0.0	0.0	0.0	0.0
10/30/08	3	1,899.7	1555.0	344.7	0.0	0.0	0.0	0.0	0.0	0.0
11/21/08	3	848.2	242.5	188.2	0.0	102.5	0.0	0.0	315.0	0.0
05/20/08	5	4,530.5	3737.6	431.2	178.0	183.6	0.0	0.0	0.0	0.0
05/28/08	5	18,778.5	17102.5	28.7	18.9	429.2	0.0	0.0	1199.3	0.0
06/16/08	5	21,866.8	13714.2	652.6	0.0	0.0	5952.1	62.4	1485.5	0.0
06/24/08	5	5,561.0	4237.1	583.0	67.9	0.0	0.0	0.0	673.0	0.0
07/09/08	5	6,406.5	0.0	924.3	0.0	0.0	4278.6	479.5	724.1	0.0
07/22/08	5	48,130.3	0.0	3522.8	281.8	104.7	44221.0	0.0	0.0	0.0
08/08/08	5	98,725.3	1883.1	763.7	0.0	149.7	95000.9	0.0	927.9	0.0
08/25/08	5	37,878.8	0.0	369.5	0.0	390.3	37119.0	0.0	0.0	0.0
09/16/08	5	2,446.7	577.7	482.8	0.0	743.9	70.6	0.0	571.7	0.0
09/29/08	5	892.0	0.0	254.9	0.0	156.2	0.0	480.9	0.0	0.0
10/14/08	5	10,781.4	2984.5	532.0	362.0	882.6	6020.3	0.0	0.0	0.0
10/30/08	5	256.4	28.9	166.5	0.0	61.0	0.0	0.0	0.0	0.0

LWWMD Water Quality  
ALI Customer No. 115

Database Last Modified

Staff Initials:

Date	Station	Total Biomass								
		(ug/L)	Bacillariophyta	Chlorophyta	Chrysophyta	Cryptophyta	Cyanophyta	Euglenophyta	Pyrrhophyta	Rhodophyta
03/27/09	3	5,389.2	4881.6	43.2	162.0	194.4	0.0	108.0	0.0	0.0
04/21/09	3	6,784.8	3814.8	26.4	1485.0	0.0	1320.0	0.0	138.6	0.0
05/13/09	3	20,268.0	6024.0	12.0	9180.0	420.0	1680.0	0.0	2952.0	0.0
05/26/09	3	10,758.0	4254.0	234.0	1620.0	120.0	4530.0	0.0	0.0	0.0
06/09/09	3	3,636.6	2712.6	59.4	594.0	132.0	0.0	0.0	138.6	0.0
06/23/09	3	4,248.0	2502.0	22.5	945.0	504.0	180.0	0.0	94.5	0.0
07/09/09	3	2,394.0	1248.0	426.0	0.0	36.0	684.0	0.0	0.0	0.0
07/31/09	3	4,125.9	1769.7	402.9	821.1	30.6	673.2	321.3	107.1	0.0
08/20/09	3	2,592.0	1812.0	234.0	180.0	120.0	0.0	120.0	126.0	0.0
08/31/09	3	11,545.6	966.4	1433.6	0.0	128.0	8889.6	128.0	0.0	0.0
09/22/09	3	6,307.2	2740.8	532.8	432.0	0.0	2505.6	96.0	0.0	0.0
10/18/09	3	8,629.4	852.8	114.4	325.0	10.4	7222.8	104.0	0.0	0.0
10/27/09	3	4,754.7	785.7	2.7	0.0	48.6	3836.7	81.0	0.0	0.0
11/12/09	3	1,521.0	538.2	127.4	0.0	270.4	507.0	78.0	0.0	0.0
05/13/09	4	13,078.8	7128.0	43.2	4698.0	367.2	729.0	0.0	113.4	0.0
05/26/09	4	6,330.0	4014.0	120.0	1260.0	216.0	720.0	0.0	0.0	0.0
06/09/09	4	4,992.0	2952.0	54.0	1440.0	312.0	234.0	0.0	0.0	0.0
06/23/09	4	3,963.8	2332.5	30.0	450.0	510.0	243.8	397.5	0.0	0.0
07/09/09	4	3,012.0	2160.0	312.0	0.0	228.0	0.0	60.0	252.0	0.0
07/31/09	4	3,056.4	810.0	1009.8	351.0	32.4	631.8	108.0	113.4	0.0
08/20/09	4	2,310.0	1272.0	330.0	180.0	24.0	0.0	378.0	126.0	0.0
08/31/09	4	9,144.0	1812.0	1302.0	360.0	24.0	5586.0	60.0	0.0	0.0
09/22/09	4	11,814.0	2982.0	36.0	900.0	120.0	7530.0	120.0	126.0	0.0
10/13/09	4	6,325.7	935.0	47.6	102.0	30.6	5142.5	68.0	0.0	0.0
10/27/09	4	1,528.2	510.3	194.4	0.0	54.0	688.5	81.0	0.0	0.0

LWWMD Water Quality  
 ALI Customer No. 115

Database Last Modified  
 Staff Initials:

Date	Station	Total Biomass								
		(ug/L)	Bacillariophyta	Chlorophyta	Chrysophyta	Cryptophyta	Cyanophyta	Euglenophyta	Pyrrhophyta	Rhodophyta
05/13/09	5	8,247.6	4210.8	23.2	2465.0	498.8	928.0	0.0	121.8	0.0
05/26/09	5	4,215.0	2692.5	37.5	1350.0	135.0	0.0	0.0	0.0	0.0
06/09/09	5	4,608.0	3246.0	30.0	900.0	432.0	0.0	0.0	0.0	0.0
06/23/09	5	4,272.0	2220.0	12.0	1620.0	216.0	78.0	0.0	126.0	0.0
07/09/09	5	7,998.0	7068.0	744.0	30.0	36.0	60.0	60.0	0.0	0.0
07/31/09	5	4,327.2	1173.6	525.6	684.0	144.0	0.0	396.0	1404.0	0.0
08/20/09	5	1,742.4	1375.2	93.6	0.0	129.6	0.0	144.0	0.0	0.0
08/31/09	5	1,338.0	870.0	144.0	180.0	0.0	24.0	120.0	0.0	0.0
09/22/09	5	20,228.0	3062.8	275.6	364.0	114.4	16203.2	208.0	0.0	0.0
10/13/09	5	5,534.0	682.0	52.0	0.0	44.0	4716.0	40.0	0.0	0.0
10/27/09	5	2,241.0	267.0	51.0	180.0	60.0	1653.0	30.0	0.0	0.0

LWWMD Water Quality Monitoring Data - 2008-09  
 ALI Customer No. 1157-03

Zooplankton Data - All Stations - Lake Wallenpaupack  
 Prepared by Aqua Link, Inc.

Database Last Modified: 02/14/11  
 Staff Initials: arl

Composite Sample denoted by "C"

Date	Station	Total Density (cells/L)	Protozoa	Rotifera	Copepoda	Cladoceran	Other
03/31/08	3	4.8	0.0	0.0	3.1	1.7	0.0
04/21/08	3	19.9	0.0	6.0	13.9	0.0	0.0
05/20/08	3	49.8	0.0	37.7	7.1	5.0	0.0
05/28/08	3	110.5	0.0	79.4	15.7	15.4	0.0
06/16/08	3	300.4	0.0	158.7	64.1	77.6	0.0
06/24/08	3	260.2	0.0	140.6	29.0	90.6	0.0
07/08/08	3	130.2	0.0	62.9	26.5	40.8	0.0
07/22/08	3	266.7	0.0	205.7	32.4	28.6	0.0
08/08/08	3	430.4	0.0	339.7	57.0	33.7	0.0
08/25/08	3	56.0	0.0	39.0	8.5	8.5	0.0
09/16/08	3	427.3	0.0	351.9	34.3	41.1	0.0
09/25/08	3	372.0	0.0	232.0	63.8	76.2	0.0
10/14/08	3	778.3	0.0	708.6	27.0	42.7	0.0
10/30/08	3	350.4	0.0	253.9	63.0	33.5	0.0
11/21/08	3	267.2	0.0	187.8	63.9	15.5	0.0
05/20/08	5	146.3	0.0	135.4	9.1	1.8	0.0
05/28/08	5	160.2	0.0	132.5	16.9	10.8	0.0
06/16/08	5	328.4	0.0	160.9	15.0	152.5	0.0
06/24/08	5	457.4	0.0	268.6	21.8	167.0	0.0
07/08/08	5	262.7	0.0	163.7	19.8	79.2	0.0
07/22/08	5	397.1	0.0	175.2	151.8	70.1	0.0
08/08/08	5	478.8	0.0	273.6	140.6	64.6	0.0
08/25/08	5	307.5	0.0	236.5	34.2	36.8	0.0
09/16/08	5	1038.3	0.0	668.0	86.5	283.8	0.0
09/25/08	5	677.1	0.0	487.1	67.7	122.3	0.0
10/14/08	5	1.9	0.0	1.6	0.2	0.1	0.0

LWWMD Water Quality Monitoring Data - 2008-09  
 ALI Customer No. 1157-03

Zooplankton Data - All Stations - Lake Wallenpaupack  
 Prepared by Aqua Link, Inc.

Database Last Modified: 02/14/11  
 Staff Initials: arl

Composite Sample denoted by "C"

Date	Station	Total Density (cells/L)	Protozoa	Rotifera	Copepoda	Cladoceran	Other
03/27/09	3	9.5	0.0	5.3	3.4	0.8	0.0
04/21/09	3	54.4	0.0	51.2	2.9	0.3	0.0
05/13/09	3	86.4	0.0	80.4	0.4	5.6	0.0
05/26/09	3	39.8	0.0	31.6	0.3	7.8	0.0
06/09/09	3	75.3	2.7	62.4	0.0	10.3	0.0
06/23/09	3	65.3	15.3	40.5	0.0	9.5	0.0
07/09/09	3	38.9	2.2	19.8	0.0	16.9	0.0
07/31/09	3	37.7	2.3	15.4	0.0	20.0	0.0
08/20/09	3	158.1	5.1	113.9	13.4	25.6	0.0
08/31/09	3	83.4	8.7	54.6	0.6	19.5	0.0
09/22/09	3	56.4	3.1	28.2	2.5	22.6	0.0
10/13/09	3	163.8	73.1	57.0	0.0	33.6	0.0
10/27/09	3	143.8	23.7	58.5	42.7	19.0	0.0
11/12/09	3	46.5	0.0	16.6	12.9	17.0	0.0

LWWMD Water Quality Monitori  
 ALI Customer No. 1157-03

Database Last Modified:

Staff Initials:

Date	Station	Total Biomass (ug/L)	Protozoa	Rotifera	Copepoda	Cladoceran	Other
03/31/08	3	4.4	0.0	0.0	2.7	1.7	0.0
04/21/08	3	11.0	0.0	3.0	8.0	0.0	0.0
05/20/08	3	21.5	0.0	12.3	4.2	5.0	0.0
05/28/08	3	49.0	0.0	22.0	11.6	15.3	0.0
06/16/08	3	191.1	0.0	77.7	35.5	77.9	0.0
06/24/08	3	193.0	0.0	69.6	22.2	101.2	0.0
07/08/08	3	87.6	0.0	19.6	13.0	55.0	0.0
07/22/08	3	102.9	0.0	57.0	14.3	31.6	0.0
08/08/08	3	138.8	0.0	78.4	29.6	30.8	0.0
08/25/08	3	27.8	0.0	13.6	5.8	8.4	0.0
09/16/08	3	290.7	0.0	227.5	23.6	39.6	0.0
09/25/08	3	255.5	0.0	143.9	34.5	77.1	0.0
10/14/08	3	748.1	0.0	687.6	15.9	44.6	0.0
10/30/08	3	238.6	0.0	172.1	33.3	33.2	0.0
11/21/08	3	186.0	0.0	128.3	43.2	14.5	0.0
05/20/08	5	53.9	0.0	45.2	6.9	1.8	0.0
05/28/08	5	47.2	0.0	30.3	5.9	10.9	0.0
06/16/08	5	250.7	0.0	87.6	6.9	156.2	0.0
06/24/08	5	349.3	0.0	162.2	14.5	172.6	0.0
07/08/08	5	94.4	0.0	9.9	9.2	75.3	0.0
07/22/08	5	196.7	0.0	54.7	73.0	69.0	0.0
08/08/08	5	224.4	0.0	94.9	61.5	68.0	0.0
08/25/08	5	115.8	0.0	65.2	14.5	36.1	0.0
09/16/08	5	812.2	0.0	471.0	55.6	285.6	0.0
09/25/08	5	468.1	0.0	308.7	36.5	122.9	0.0
10/14/08	5	992.2	0.0	804.9	108.1	79.2	0.0

LWWMD Water Quality Monitori  
 ALI Customer No. 1157-03

Database Last Modified:

Staff Initials:

Date	Station	Total Biomass (ug/L)	Protozoa	Rotifera	Copepoda	Cladoceran	Other
03/27/09	3	5.5	0.0	0.5	4.3	0.7	0.0
04/21/09	3	8.5	0.0	4.6	3.6	0.3	0.0
05/13/09	3	13.2	0.0	7.2	0.5	5.5	0.0
05/26/09	3	10.9	0.0	2.8	0.4	7.7	0.0
06/09/09	3	15.2	0.1	5.1	0.0	10.1	0.0
06/23/09	3	13.2	0.3	3.5	0.0	9.3	0.0
07/09/09	3	18.3	0.0	1.6	0.0	16.6	0.0
07/31/09	3	21.4	0.0	1.7	0.0	19.6	0.0
08/20/09	3	61.0	0.1	9.9	24.9	26.1	0.0
08/31/09	3	24.9	0.2	4.8	0.8	19.1	0.0
09/22/09	3	27.6	0.1	2.3	3.1	22.2	0.0
10/13/09	3	39.0	1.5	4.7	0.0	32.9	0.0
10/27/09	3	132.8	0.5	7.0	104.2	21.1	0.0
11/12/09	3	42.6	0.0	2.3	21.8	18.5	0.0