

## **Summary of Six Ponds Water Quality Results (8/27/11)**

In November of 2010 and again in June of 2011, we collected water samples from each of our six ponds. The samples were analyzed at Envirotech Laboratories in Sandwich.

In November, top and bottom samples were drawn from each of our six ponds (from two locations in Little Long Pond and from one location in each of the other ponds). In addition, one duplicate sample was drawn as a check on the reliability of the analyses, and the results of these two samples were very close to one another.

In June, top and bottom samples were drawn from each of our ponds (from two locations in Little Long Pond, from two locations in Halfway Pond, and from one location in each of the other ponds). In addition, two duplicate samples were drawn to check on the reliability of the results. Some of the duplicate results were very similar, but two parameters varied more than we have seen in the past.

All locations were ones which have been sampled at other times over the past eight years.

The Town of Plymouth paid for the analysis of all samples collected in November of 2010 and in June of 2011. We anticipate that the Town will be paying for the analysis of samples collected this coming fall and next spring. However, the Town is no longer analyzing for some of the parameters we have used over the past 10 years, and this has made it impossible to make some of the comparisons we have been able to make in the past.

### **Phosphorus**

Last fall, eutrophic levels of Phosphorus were found in all of the top and bottom samples from Little Long (a typical finding). Both samples from Round had eutrophic levels of phosphorus (much less common). Half the samples from Halfway and Long had eutrophic levels, but none of the samples from Bloody or Gallows had eutrophic levels.

In June of 2011, eutrophic levels of Phosphorus were found in all of the top and bottom samples from our ponds, and nearly than two-thirds of these had levels which were at least twice the eutrophic level. Note that in June of 2010 only about one-third of the samples had levels that were nearly twice the eutrophic level.

Samples drawn from six specific locations (either top or bottom) since 2002 reveal the following pattern:

Little Long – 20 of 22 samples taken from this pond since 2002 were high  
Halfway – 19 of 22 samples ..... were high  
Long – 11 of 20 samples ..... were high  
Round – 8 of 15 samples ..... were high  
Bloody – 8 of 16 samples ..... were high  
Gallows – 6 of 15 samples ..... were high

The recent November and June results pushed the proportion of high readings for each pond up a little from what had been tallied each year since 2002.

### **Nitrate**

Over the past ten to fifteen years, samples from Little Long have contained more Nitrate than samples from any of our other ponds.

This past fall, the Nitrate levels in all four Little Long samples were again much higher than those found in any of the samples taken in past years. At times the Nitrate levels in Bloody approach those typically found in Little Long, and they did again this fall.

This June, the Nitrate levels in all Little Long samples were entirely consistent with what has been found in the past.

Given this trend for Little Long, the Nitrate results should be a cause for considerable concern. Note that studies done by the Town in 1980 stated that observed numbers considerably lower than these were bordering on critical levels for the environment.

### **Salt Components** (e.g., chloride, sodium, potassium)

The November samples again confirmed results from several prior years that salt components such as Chloride, Sodium, and Potassium were highest in Bloody, next highest in Little Long, third highest in Long, and much lower in the rest of our ponds. Specific conductance results also indicate the presence of salt components, and these results were entirely consistent with the other salt results.

In June, the Town deleted the salt components from its analyses and analyzed only for specific conductance, and these results again confirmed the pattern of results just described.

In any case, the years of similar numbers consistently suggest that salt and salt components in road runoff from Route 3, Long Pond Road, Clark Road and Oar and Line Road are negatively affecting the water quality of our ponds.

## **E-coli**

Tests for e-coli consistently yield numbers which are far below what constitute a cause for concern.

The suite of parameters which have been routinely analyzed by Envirotech in the past is as follows:

<i>E-coli Mtec</i>
<i>pH</i>
<i>Spec. Conductance</i>
<i>Nitrate-N</i>
<i>Nitrite-N</i>
<i>Sodium</i>
<i>Iron</i>
<i>Manganese</i>
<i>Potassium</i>
<i>Calcium</i>
<i>Magnesium</i>
<i>Hardness</i>
<i>Alkalinity</i>
<i>Sulfate</i>
<i>Chloride</i>
<i>Color</i>
<i>Turbidity</i>
<i>Total Phosphate (P)</i>
<i>Free CO2</i>

The suite of parameters which the Town had Envirotech analyze in June was as follows:

<i>E-coli Mtec</i>
<i>pH</i>
<i>Spec. Conductance</i>
<i>Nitrate-N</i>
<i>Nitrite-N</i>
<i>Turbidity</i>
<i>Total Phosphorus (P)</i>
<i>Total Nitrogen</i>
<i>Total Kjeldhal Nitrogen</i>

At this time, we have no comparative data on the last two parameters, but it should be noted that the Total Nitrogen and Total Kjeldhal Nitrogen levels were elevated in some of the samples from Little Long pond and Long pond.