

Memorandum

To: Colleen Lyons, Lake Hopatcong Commission
Kyle Richter, Lake Hopatcong Foundation
Caitlin Doran, Lake Hopatcong Foundation
Marty Kane, Lake Hopatcong Foundation
From: Patrick Rose, Princeton Hydro
cc: Lake Hopatcong Commission
F.S. Lubnow, Ph.D., Princeton Hydro
Date: 13 October 2025
Re: Brief update on project activities

This memo provides a summary of the Lake Hopatcong Commission (LHC) project activities for Lake Hopatcong and its watershed.

1. The last standard water quality monitoring event of the season was conducted on 24 September 2025:
 - The mean Secchi depth at ST-2 (mid-lake) in 2025 was 1.5 meters (5.0 ft). The seasonal mean in 2024 was 1.3 meters (4.3 ft).
 - The mean Secchi depth at ST-3 (Crescent Cove) in 2025 was 1.2 meters (4.0 ft). The seasonal mean in 2024 was 0.9 meters (3.0 ft).
 - Cyanobacteria densities were below the Advisory threshold of 80,000 cells/mL at all stations with the exception being ST-10 (Woodport Bay); ST-10 had a cyanobacteria density of 83,000 cells/mL. ST-10 was the only station that exceeded 80,000 cells/mL in August as well.
 - The mid-lake (ST-2) surface cell count was 38,392 cells/mL.
 - The September 2025 cyanobacteria cell count at ST-3 was below the Watch threshold (17,969 cells/mL) and was 87% lower than the **September** 2024 cyanobacteria cell count of 141,818 cells/mL. The seasonal mean cyanobacteria cell count at ST-3 in 2025 was 48,379 cells/mL, which is 64% lower than the 2024 mean of 134,629 cells/mL.



The mean surface total phosphorus concentration in September was 0.035 mg/L.

- The deep soluble reactive phosphorus (SRP) concentration in September 2025 (0.021 mg/L) was substantially lower than its respective value in 2024 (0.085 mg/L). The seasonal mean deep SRP concentration in 2025 was 82% lower than 2024, with respective values of 0.008 mg/L and 0.044 mg/L. This is an indication that the alum treatment substantially reduced dissolved phosphorus concentrations in the hypolimnion.

2. All post-treatment data for the alum treatment conducted during the fall of 2024 under the Lake Restoration grant has been collected. Overall, the data has been very positive. One more Biochar sock will be removed from a Filterra stormwater unit in Jefferson Township and sent to the lab for analysis. The final report for this grant will be submitted in early 2026.

3. Princeton Hydro conducted the submerged aquatic vegetation survey in early September. The data from the survey is currently being compiled and the report will be submitted before the end of the year.

4. Princeton Hydro and the LHC continue to coordinate with the National Fish and Wildlife Foundation regarding the use of remaining funds for other planting projects throughout the watershed.

5. Princeton Hydro continues to work on the New Jersey Department of Environmental Protection Stormwater Management Grant awarded to the Lake Hopatcong Foundation for the Design and Installation of a bioretention system in Jefferson Township. The plan was recently revised to include a larger bioretention system, increasing the capacity to filter pollutants.

6. Princeton Hydro continues to work on the Highlands Council funded project for the surveying, design, and engineering for the two basins along Mt. Arlington Blvd in Roxbury Township. The surveyor is heading back to the site this week to obtain measurements on a few remaining items.

7. Princeton Hydro initiated the four remaining treatments for the US Army Corps of Engineers, Engineer Research and Development Center project on 15 September. The Northern Cove application was conducted first, followed by Landing Channel and Van Every Cove. The final application in Great Cove began last week and is expected to be done at the end of this week. Results from the early season applications in Crescent Cove and Ashley Cove have been positive, and we will continue to collect data at all sites through next year.

Dr. Fred Lubnow, Princeton Hydro - Update on Army Corps Grant Activities.

Dr. Lubnow discusses the Aquatic Plant Survey and states that as part of the study Princeton Hydro analyzed aquatic plant materials to quantify the amount of phosphorus and nitrogen that is being removed through the Commission's weed harvesting program. This year, 1,682 cubic yards of aquatic plants were removed from the lake, and their testing shows that this equates to 760 pounds of phosphorus and 16,000 pounds of nitrogen. So, the weed harvesting program not only opens waterways for recreation and ecological reasons, but it also takes nutrients out that would otherwise fuel harmful algal blooms. Dr. Lubnow outlines which nutrients are of concern for Lake Hopatcong and states that projects on the lake do focus on both phosphorus and nitrogen, but nitrogen concentrations on the lake are low from a management perspective. Preventative management projects keep nitrogen down, these include green infrastructure, goose management programs, stormwater management projects, the mandatory pump out of septic systems, eventual sewerage of the watershed, and floating wetland islands. He states that Lake Hopatcong does have a surplus of phosphorus and that is why the primary focus of many projects is on phosphorus. Dr. Lubnow states that he attended the Army Corps HAB Workshop conference where NJDEP gave a presentation on Harmful Algal Bloom (HAB management), and they described Lake Hopatcong as having a surplus of phosphorus and being nitrogen limited.

Dr. Lubnow provides information on funding for HAB prevention. He states that on September 10th a program passed the Senate for HAB management and is still in the federal budget. If the budget is passed the program will provide funding for HAB management projects between 2026 – 2030. They are interested in selective dredging to remove the overwintering habitat of HABs. He believes dredging could be an eligible project for Lake Hopatcong. Even though the dredging would focus on HAB management it would have additional benefits. They are also interested in beneficial reuse (for a project like the Floating Island Restoration in Landing Channel).

Dr. Lubnow provides information on the projects completed under the Army Corps Engineer Research and Development Center (ERDC) Grants awarded to Princeton Hydro. He states that two of the demonstration projects were completed in April and used conventional algaecide, so the permits were standard pesticide applications. They treated in Ashley cove with a chelated copper product and in Crescent Cove with an oxidizer. Although they used standard products, the treatments were considered innovative because treated directly over the sediments where the overwintering algae are. The post-treatment data has shown clearer water with more plants and less algae. He states these conditions are more favorable to an algae dominant lake because plants do not shut down beaches and there are ways to deal with the plants such as mechanical weed harvesting. Volunteers from the Musconetcong Watershed

Association who monitor for HABs around the lake have been asking why conditions have improved in Crescent Cove, and this treatment is why.

Dr. Lubnow continues and describes the treatments completed later in the season. He states that the late summer and fall treatments were in Landing Channel using a chitinase product (ground up exoskeleton of invertebrates) it is a very green and ecofriendly way of dragging algae cells to the bottom. He states that the reason they focus on dragging algae cells to the bottom is that there are known genera of heterotrophic bacteria in sediments that will breakdown cyanobacteria and cyanotoxins. Princeton Hydro is sampling to find out if these bacteria are in Lake Hopatcong's sediments and would break down the cyanobacteria. This is why there is a focus of dragging cells to the bottom of the lake. The other products that were used in Northern Cove (Woodport Area) are Alum and Eutrosorb. These techniques have been evaluated in mesocosms and now Army Corps wants to test them in the field. He states that there were some surface scums that were noticed in Northern Cove post-treatment. Princeton Hydro attributes this to low water levels and that helped to stir the sediments up during the boat races. Princeton Hydro will be monitoring to see if the cells will breakdown and decompose after the sediments settle again. They are also monitoring to see if there will be a reduction in cells post-treatment as they saw in Crescent Cove.

Dr. Lubnow states that the other treatments that were completed were reactive treatments, or treatments that occur after a bloom is reported. Reactive Treatments were done in Van Evry and Great Cove. Princeton Hydro used an oxidizer to kill algae cells and then dragged them to the bottom. They are looking at products that are existing (non-copper) algaecides or flocking agents like chitinase or Eutrosorb G. He states that Army Corps has been impressed by the relationship between Lake Hopatcong and NJDEP to get the permits. They have also asked for data, but Princeton Hydro is still collecting data. Army Corps also needs to review the data before it can be released publicly.

Dr. Lubnow states that NJDEP visited Princeton Hydro's main office to review their records, and everything is in compliance. They inspected their field office as well. Dr. Lubnow then addresses questions that were posted online about the treatments and employees or contractors who were dressed in respirators and suits. He states that once the oxidizers hit the water/diluted, they are non-hazardous, but you do not want to get it on your skin. So, the people completing the projects are following the product guidelines, the permits, and the rules and regulations of the DEP and the EPA.