

## Overview

City Name	Project Name	Tech Area	Budget for Solution	City Point of Contact
Southampton	Environment Monitoring of Nitrogen Pollution	Water Purification & Contaminant Removal	\$200,000	Gary Goleski <a href="mailto:ggoleski@southamptonvillage.org">ggoleski@southamptonvillage.org</a>

## Project Briefs

### Project 1: Environment Monitoring of Nitrogen Pollution

- **Project Scope. Please provide project narrative. Outline the problem that needs a solution and include high level timeline and end product. Be clear and succinct.**

Since the earliest colonial settlement, Lake Agawam has been a central, uniting feature of the Village of Southampton. As the quality of its waters has deteriorated over time, recreational enjoyment and interaction within Lake Agawam has diminished as it has become one of the most polluted lakes in the state of New York. The Village of Southampton has worked to collaborate with the NYSDEC, Town Trustees, the Lake Agawam Conservancy and others to draft the Harmful Algal Bloom (HAB) Action Plan which is a roadmap toward remediation of the Lake. All projects within this application are synergistic and are priorities within the HAB plan. The first project centers on finding new and creative solutions for remediating contaminated groundwater. Groundwater contaminated with nitrogen from onsite wastewater fuels toxic algal blooms in Lake Agawam, creating a serious public health threat in Village of Southampton. As such, the NYSDEC HAB Action Plan for Lake Agawam has identified addressing this pollution as a top priority. Large scale technological advances for managing sanitary waste throughout the watershed has been deemed imperative. Because groundwater contaminated with wastewater nitrogen can take decades to reach Lake Agawam, there are two distinct approaches needed to address this issue which are described below.

We aim to launch the project in January 2021 and will seek to be complete by December 2021.

- **Ideal Technology Solution**

The first technological solution involves dozens of homes surrounding the Lake that have been identified as a high priority for upgrading the septic systems to innovative and alternative onsite wastewater treatment systems (I/A OWTS) that reduce nitrogen effluent by more than 80%. The New York State Center for Clean Water Technology (CCWT) has developed novel I/A OWTS called Nitrogen Removing Biofilters (NRBs) that reduce nitrogen levels by more than 90% to less than 10 milligrams of N per liter, lower than any commercially available I/A OWTS. Furthermore, CCWT has developed wastewater polishing units capable of being used in conjunction with commercially available I/A OWTS and can reduce effluent to less than 5 milligrams of N per liter, again, better than any system on the market today. To address the wastewater emanating from lakefront homes and seeping into Lake Agawam, CCWT will work with region engineers to consider optimal I/A OWTS for each home. There is no 'one size fits all' when it comes to onsite wastewater solutions, as each home and property is unique. The

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specific conditions of each home will be considered, and optimal solutions will be designed. CCWT will work collaboratively with engineering firms to consider the ideal solution for each property given the existing conditions (grade, soil type, existing septic system, existing utilities, depth to groundwater, size of home, number of occupants, etc). In cases where a commercial I/A system is the best solution, CCWT's polishing units (i.e. woodchip boxes and denitrifying drainfields) can be employed to reduce nitrogen effluent below 3 mg/L. Engineering plans for each home will be submitted to Suffolk County Department of Health Services and financial assistance programs will be evaluated. It is anticipated that this program could design I/A OWTS for nearly every lake-front home on Lake Agawam as well as those in the surrounding region. To evaluate the performance of I/A OWTS installed along Lake Agawam, CCWT will install telemetered, real-time nitrogen sensors on these systems. CCWT recently won a national competition for the development of these low-cost nitrogen sensors sponsored by USEPA, beating out companies from across the globe.

While addressing the discharge emanating from homes along the lake will address wastewater that seeps into groundwater and enters the Lake in a matter of days to weeks, the watershed of Lake Agawam is large and it can take decades for some groundwater entering the lake to discharge. To protect the lake against this 'legacy groundwater' contamination, CCWT is already working collaboratively with regional engineering firm, CDM Smith, to study groundwater entering Lake Agawam. This Smart Cities award will be used to design a permeable reactive barrier (PRB) on the northern end of the lake. The award-winning nitrogen sensors designed by CCWT will play a key role in evaluating the performance of the PRB. Because the PRB is a high priority mitigation approach for the HAB Action Plan, the Village of Southampton and the Lake Agawam Conservancy are working collaboratively to fund the first two stage of a groundwater study that will facilitate the design and installation of the PRB. These activities are considered matching funds for this project. The Ideal vendor should be a company or firm that has the engineering and technical expertise to help with the design and implementation of the permeable reactive barrier on the northern end of the lake.

- **Required Cybersecurity and Privacy Standards**

All technology solutions must align with the Village of Southampton's cybersecurity and privacy policies.

- **Project Funding: \$200,000**

We are expecting the project to cost roughly \$596,025 to execute over a 1-year timeframe. We are able to commit \$134,250 to the project and expect an in-kind or monetary contribution from the NYS Center for Clean Water Technology of \$214,375. The Village of Southampton is looking for approximately \$50,000 contribution from the relevant technology company either through in-kind services or cash match to pilot its solution in the City of ESD. The contribution from NYS via the Smart Cities program is \$200,000.

- **Other Considerations & Helpful Info**

This project supports the recently complete Lake Agawam Harmful Algal Bloom Action Plan which can be found here:

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[https://www.dec.ny.gov/docs/water\\_pdf/habapagawam.pdf](https://www.dec.ny.gov/docs/water_pdf/habapagawam.pdf)