



NYSP21 Performs Environmental Field Test for Sunny Clean Water's Solar Water Purification System

Sunny Clean Water, LLC (SCW) is developing a low cost, high yield solar still system for personal drinking water purification. Based on research at the University of Buffalo, SCW's system utilizes a specially designed dark nanofiber material to accelerate evaporation of water using the sun's energy, producing filtered water.

CHALLENGE

SCW utilizes solar distillation, a concept for water purification understood since the fourth century B.C. In the SCW design, water evaporates and rises through a nanofiber material and then condenses back into a reservoir. The process of evaporation and condensation within the solar still system removes contaminants from various water sources, producing filtered water. According to SCW, the nanofiber material is claimed to be 88% efficient in converting solar energy into heat and three times faster than current solar stills on the market.

To support these claims, SCW requested assistance from the New York State Pollution Prevention Institute (NYSP21) to conduct a comparative field test of their solar water purification system with another solar distillation system currently available on the market. NYSP21 evaluated the quantity of water distilled, speed of distillation, and resulting water quality for both systems.

SOLUTION

NYSP21 supported SCW with conducting a comparative field test of their solar water purification system. NYSP21 identified and quantified contaminants to be tested in a selected body of water. Additionally, testing was conducted on SCW's system and a baseline system over a 30 day period. During this timeframe, NYSP21 collected information on water quality, quantity and speed of distillation of the SCW and the baseline system. Once this data was collected, the filter's reduction of contaminants was compared to the New York State Department of Health Water Quality Standards.

RESULTS

The work performed by NYSP21 led to key findings that will assist Sunny Clean Water with further developing, optimizing and commercializing their system.

- When normalizing the results per unit area of filtration, the SCW system produced 4½ times more water (liters per area of nanofiber material) over the testing period as compared to the baseline system.

CHALLENGE

- Sunny Clean Water wanted to conduct a comparative field test of their solar water purification system with another solar distillation system currently available on the market

SOLUTION

- A comparative field test of Sunny Clean Water's purification system was conducted
- NYSP21 identified and quantified contaminants to be tested in a selected body of water

RESULTS

- NYSP21 identified key findings that will assist Sunny Clean Water to further develop, optimize and commercialize their system
- Sunny Clean Water plans to manufacture their product in New York State and projects the creation of ten additional jobs



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- The SCW and baseline system met all NYS Water Quality requirements for element levels of phosphorus, chloride, sulfate, aluminum, calcium, magnesium, potassium, silicon, and sodium
 - > The SCW system filtered calcium, chloride, and sodium more effectively than the baseline system.
- New York State water quality standards for E.coli were met with the SCW system for half of the test period.
- The SCW system performed similarly on sunny/ partly sunny (7 days) vs. cloudy/rainy (23 days) days, producing over 50% of the total water collected on cloudy/rainy days.

The SCW system filtered out each of the tested elements throughout the 30-day period. Towards the conclusion of the testing, the SCW system did not perform as well with the microbiology (total coliforms and plate count) tests, indicating a possible buildup of microbiology over time. SCW will be working to implement potential improvements in order to mitigate microbial buildups.

SCW plans to manufacture their product in New York State and projects the creation of ten additional jobs over the next three years to support the projected business growth.

“We had a very smooth and pleasant experience working with the NYSP2I to conduct this comparative field test for our solar still product. The staff were professional, experienced, and easy to collaborate with. The entire project was managed in a very organized manner. The final report delivered from this project well meets our expectation and provides many useful assets assisting us to further improve our product design. We highly recommend working with NYSP2I.”

– Zongmin Bei,
Sr. Research Support Specialist
Sunny Clean Water, LLC

NYSP2I PARTNERS



New York Manufacturing Extension Partnership

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