



STATEWIDE WATER REFERENDUM A FAILS

On November 4, 2003, voters across the state rejected Referendum A, a ballot question authorizing issuance of \$2 billion of principal revenue debt for purposes of financing water projects. The final vote was 67% against the measure and 33% in favor of the measure. The measure would have authorized revenue bonds, the proceeds of which could have been used for public and private projects costing \$5 million or more. It would have also set aside \$100 million for projects that augment or improve existing facilities or conserve existing water supplies without creating new storage facilities. The legislature is expected to address alternative means of addressing water supply and storage needs at its next session, which convened in January 2004.

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Solar Solution for Algae and Milfoil

When lake managers and residents discuss their biggest water-quality issues, algae blooms and nuisance plants often top the list. There's no question that these are two of the major causes of declining recreational and aesthetic value in many lakes around the country. Efforts to control these problems often require significant ongoing costs, are labor intensive, and may even harm the environment if not applied properly.

However, a recently completed case study showing the positive impact of solar-powered circulation in a reservoir in New York State is catching the attention of professionals and homeowners around the country.

The raw water reservoir, one of five supplying the Highland Water District in the Town of Lloyd, had long-standing problems that made it virtually useless to the town. Summer algae blooms and a dense crop of Eurasian Watermilfoil were an annual occurrence, and falling leaves from shoreline trees added to the organic buildup on the reservoir's bottom. A long hydraulic residence time and the thick layer of decaying humic substances kept the reservoir anoxic.

According to John Jankiewicz, Water and Sewer Administrator for the district, the water quality was so poor that taste and odor in the treated supply was unacceptable even when diluted at a 1:20 ratio with water from other sources. Faced with increasing

demands and unable to utilize the 1.4 million gallons in the 7.5-acre reservoir, the district was forced to draw from the Hudson River at an additional expense to meet their needs.

Unwilling to enter into a never-ending cycle of chemical treatments, and hoping to avoid the on-going energy costs of typical mechanical aeration devices, Jankiewicz began searching for a more environment-friendly solution. What he found was a floating, solar-powered reservoir circulator called the SolarBee, manufactured in North Dakota by Pump Systems, Inc. (PSI).

Jankiewicz and his engineers were intrigued by the SolarBee's method of operation: gently drawing water near the bottom of the reservoir and spreading it across the surface via laminar flow. In their mind, it had the potential for supplying the circulation and oxygen that weren't occurring naturally. They studied other applications of the unit, in both fresh water and wastewater ponds, and discussed their particular problems with company representatives.

According to Joel Bleth, president of PSI, the solar-powered circulators increase dissolved oxygen (DO) levels in the water column, first through surface renewal, then by enhancing the distribution of beneficial algae and the pure photosynthetic DO it produces. "The SolarBee circulates up to 10,000 gallons per minute over the

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**American Water Resources Association
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surface of a reservoir, and then brings it gently across the silt layer, enhancing the biochemical reactions to increase organic digestion,” states Bleth. “The higher pH water increases the formation of *hydroxyapatite*, the rocklike substance created by the bonding of soluble phosphorous with calcium. Locking up phosphorous prevents its availability as a nutrient for blue-green algae and nuisance macrophytes.”

The Highland Water District decided to try the circulators. When the factory installation team arrived in July, the milfoil had already overtaken the entire reservoir. The machines were placed in the center of each of two open areas in the reservoir and anchored with concrete mooring blocks. Although the district’s employees had to initially keep the machines free of loose milfoil, within two months they were working as expected.

In January of 2003, Jankiewicz declared the test a success. He reported the ability to use water from the reservoir for the first time in his 20 years with the district. “Water clarity had already begun to improve,” he recounts, and the taste and odor problems were diminishing.

By mid-summer, when the reservoir was typically covered with blue-green algae and milfoil, Jankiewicz found only excellent clarity throughout. In fact, he was now able to draw the maximum amount of water from the reservoir without negative impact on the treated water quality, eliminating the district’s dependence on the Hudson River.

Jankiewicz praised the SolarBee’s performance for “not only eliminating our algae bloom...but also the milfoil that has plagued us.” Bleth explains that tying up phosphorous, both through formation of apatite and by helping the “good” green algae to compete with blue-green algae and macrophytes for phosphorus is the key to reversing eutrophication in lakes and reservoirs. “Using power from the sun to create beneficial mixing in a lake is much more in tune with nature than simply adding yet more chemicals to the water,” he stated.

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*Solar Bee model SB10000
with draft tube*