



Membrane Deaeration Removes Entrained Air

United Water New York



Membrana Liqui-Cel deaerators remove entrained air at the UWN treatment facility.

Many public water supplies have entrained air that causes the water to appear “milky” or “cloudy”. Conventional methods to remove entrained air can result in headloss reduced capacity, and – in the case of stilling basins - add significantly to a plant’s footprint and require additional construction. However, left untreated, entrained air can adversely affect flow capacity, and result in lower water pressures and reduced fireflow capacity.

United Water New York (UWN) owns and operates the water supply, treatment, and distribution system that serves most of Rockland County, New York, including 45 wells. Some of these wells contain high levels of entrained / dissolved air and must be operated below capacity.

Hydrophobic membranes have been used successfully in the beverage and semi-conductor industries for the removal of entrained gases. To determine whether this technology was suitable for use in municipal drinking water, UWN pilot tested a Membrana Liqui-Cel to remove dissolved air from several wells.

Following the successful pilot test, UWN contracted with Layne for design and construction of deaeration systems for two wells. The challenge was to optimize the use of these wells while minimizing capital and operating expenditures. One well designed to operate at a flow of 1700 gpm, the other at 1000 gpm. The treatment trains installed by Layne were designed for peak capacities of 2400 and 1200 GPM, respectively. Results of the test included:

- Two full-scale facilities were constructed, providing reduced CapEx and OpEx compared to typical technologies for dissolved air removal.
- Significant construction savings were realized versus the \$3.3M cost of a basin/booster pumping facility.
- The membranes required half the footprint and were installed on a concrete slab, eliminating the need for a larger underground structure.
- Reduced footprint & above-ground construction shortened the project.
- Wells now operate at their full design and permit capacity.
- Well water is pumped without breaking head.
- Headloss through the membranes is less than 5 psi, so existing pumps experience minimal reduction in pumping rate.

Owner:

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*Glass on left: raw water from well.
Glass on right: after de-gasification.*

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