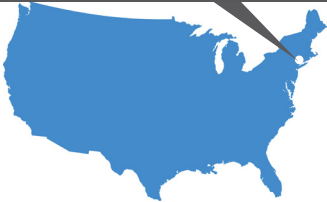




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## Removing 45% THMs in Aquarion Water Company's high service clearwell

AQUARION WATER COMPANY, CT



### Project Summary

**Customer:**

Aquarion Water Company, CT

**Type of Project:**

Trihalomethane removal system

**Results:**

The PAX TRS™ system met the performance goals, successfully removing 45% of THMs with the quick-turnaround clearwell intervention

While the addition of chlorine is one of the safest and most effective means for water disinfection, under certain circumstances, chlorine – in combination with naturally occurring organic compounds in water – can lead to the formation of undesirable disinfection byproducts (DBPs). Among the most common DBPs is a family of volatile compounds called trihalomethanes (THMs), which are regulated in the United States to a level of 80 ppb (parts per billion) by the U.S. Environmental Protection Agency.

As water age – the time from water treatment in a plant to ultimate use – increases, THM formation progresses, with water utility operators closely monitoring their system's locational running annual average (LRAA) for THMs.

### Lowering the THM Level

For several years, Bridgeport, Connecticut-based Aquarion Water Company had been monitoring its system's THM formation and attempted to lower the level through treatment and distribution system changes. THM formation typically peaks as water temperatures increase seasonally and with increasing water age. At the time, Connecticut was also experiencing severe drought, which resulted in a reduction of water use and a subsequent increase in water age in Aquarion Water Company's system. Aquarion engineers decided that reducing THM formation in the Laurel High Service Clearwell at the Stamford Water Treatment Plant would eliminate concerns of elevated THM formation in the distribution system served by the plant.

The Laurel High Service Clearwell is a below grade water tank that has a volume of 1.5 million gallons with about 50% daily turnover. PAX Water Technologies was selected for the project to strip THMs from the Laurel High Service Clearwell. With over 150 systems in operation, PAX has significant experience in utilizing

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— Yesher Larsen, Manager of Technical Services, Aquarion Water Company

water storage assets as intervention points to eliminate THMs in distribution systems.

### The PAX TRS™ system

Essentially, the PAX TRS™ system uses the water tank as a reaction vessel to enhance the volatilization of THM compounds from the liquid phase (water) into the gas phase (headspace of tank) and move them out of the tank with aggressive ventilation. The PAX TRS™ system of components that include submerged mechanical tank mixers, rooftop ventilation units and water surface aerators all play a role in moving THMs from being trapped in the tank water into the headspace and out of the tank.

Several design modifications were made to accommodate the unique features of the Laurel High Service Clearwell. Two 0.5 HP PAX Variable Angle Mixers (VAMs) were chosen to ensure a strong mixing profile throughout the tank despite the relatively low 16-foot ceiling height. The Powervent® ventilation unit was sized at 1.0 HP to effectively break the Henry’s Law gas/liquid equilibrium and evacuate the tank headspace of THMs. Additionally, the PAX Neptune™ design software added a floating surface aerator to enhance mass diffusion of the various THM species from the water phase to the gas (air) phase. Finally, due to the role of the clearwell in plant operations, the equipment was installed in a phased fashion over a couple weeks without taking the tank down.

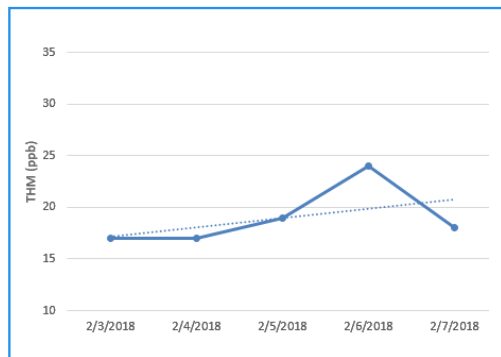
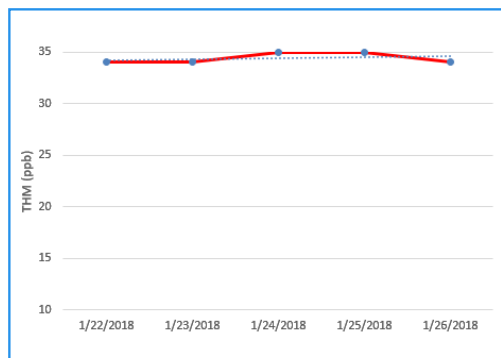
Aquarion Water Company and PAX Water Technologies agreed that, for the addition of less than 20 HP and the described equipment scope, a removal goal of 40% of the THMs was achievable.

### Attaining performance goals

The system met the performance goals, successfully removing 45% of THMs with the quick-turnaround clearwell intervention.

“The PAX TRS™ has been working well to help us achieve our company target of maintaining LRAA of less than 80% of the THM MCL. We needed help fast, and PAX helped us meet our target,” said Yesher Larsen, Manager of Technical Services for Aquarion Water Company.

A wholly-owned subsidiary of Eversource, Aquarion Water Company is the public water supply company for more than 625,000 people in 52 cities and towns throughout Connecticut, as well as serving customers in Massachusetts and New Hampshire. It is the largest investor-owned water utility in New England and among the seven largest in the U.S.



**PAX TRS™  
THM  
Removal  
System  
Achieved  
a 45%  
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Rate in the  
Laurel High  
Service  
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