

CASE STUDY

CITY OF OLD TOWN

Mixing Eliminates Ice and Prevents Damage in New England Standpipe



OVERVIEW

Old Town, Maine, has a historical legacy that spans several centuries. The town's origins can be traced back to the early 18th century when it was originally settled by Native American tribes. The Penobscot people established a vibrant community along the banks of the Penobscot River.

The area's strategic location, abundant natural resources, and proximity to waterways facilitated the establishment of mills and factories, which became the cornerstone of the town's economy in the 19th and early 20th centuries.

As a result, Old Town flourished as a center for timber production, paper manufacturing, and textile mills. The growth of the University of Maine in the 20th century also contributed to the town's development, bringing education and cultural opportunities to the area. Today, Old Town hosts a population of just over 7,000 residents

and remains a vibrant community that cherishes its heritage, while embracing progress, making it a unique and dynamic place to live, work, and explore.

SITUATION

Ice formation inside steel potable water storage tanks is a common occurrence in the northern United States and throughout most of Canada during the winter. Depending on the average air temperature, the inlet water temperature and the amount of turnover, ice formation can range from a thin skin on the top and northern walls of a water tank, to a massive ice cap that weighs many tons.

While most people enjoy a little ice in their glass of water, thick ice in a water tank can spell disaster. Ice formation inside tanks can lock-up millions of gallons of storage and compromise operations, leaving utilities exposed and unable to respond in emergency situations. Infrastructure is damaged when a jagged plug of ice scrapes the sides of a water tank as the water level fluctuates. If internal hardware (such as ladders and cathodic protection) inside a tank becomes locked in the ice, the rise and fall of the ice cap can literally tear this hardware apart. Each spring, even modest damage to tank coatings may require a partial or complete overhaul, costing tens of thousands of dollars. This damage is preventable.

Moving water is more difficult to freeze than still water. If the warm water (~35-42°F) which enters the bottom of a



Twin .5 MG Standpipes at Old Town

tank during a fill cycle is circulated to the top layers in a consistent flow pattern, then freezing should be reduced or prevented.

APPROACH

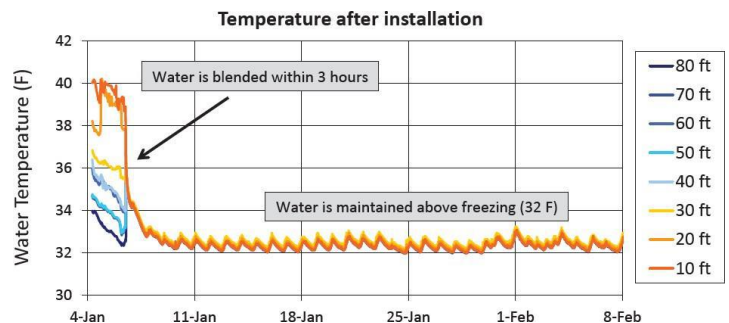
The operators at Old Town Water District in Maine provided an ideal opportunity to test the capabilities of the PAX submersible mixer to prevent ice formation. Old Town had recently installed side-by-side 0.5-MG standpipes and, during a previous winter, one of the standpipes was damaged by ice formation. The following December, the operators at Old Town installed a PAX Water Mixer in one of the tanks along with temperature probes in both the mixed and the unmixed tanks.

RESULTS

- After several weeks of operation, the mixed tank contained only liquid water, while the unmixed tank had a persistent, frozen, ice cap.
- Within hours after the mixer was first turned on, the temperatures had completely blended. Temperatures were even throughout the tank.
- Despite the arctic temperatures outside, the water temperature in the mixed tank stayed just above the freezing point of 32°F.
- Because PAX Mixers can operate 24/7 with little maintenance, Old Town could run the PAX Mixers constantly and in harsh temperatures to keep the water in the tank from freezing.



The top picture shows the ice formation inside the standpipe without the mixer, extending into March. The bottom picture shows the ice-free surface of the tank inside the standpipe with a PAX Mixer installed.



CONCLUSION

Old Town was able to avoid ice formation active mixing as a result of PAX Mixers. PAX Mixers are ideal for operators who want to prevent freezing in their tanks in the winter and thermal stratification in the warmer months. Seasonal inversions, stagnant water and ice damage can be managed and prevented with PAX Mixers. Learn more about our family of mixers at cleanwater1.com.

"This is a device that works, plain and simple. Easy to install, economical to operate. I'm never going to worry about ice in my tanks again."

Frank Kearney Sr., Old Town Water District

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