

Case Study

City of Lowell, Massachusetts, Edmund F. Tarmey Water Utility



Overview

On May 11, 2022, Steve Duchesne (Superintendent of Operations) and Matt Sayer (Filter Operator) met with us for an in-depth discussion of the water treatment process for the City of Lowell, Massachusetts and a tour of the facility.

The Edmund F. Tarmey Water Utility, located on the bank of the Merrimack River, provides an average of 11 million gallons per day to approximately 135,000 residents and businesses in the city of Lowell and nearby Dracut, Tyngsboro and Chelmsford. The total capacity of the plant is 30 million gallons per day.

Source Water

The Merrimack River provides the source water and can be highly variable as far as the raw water characteristics, requiring nearly constant monitoring. Turbidity, in particular, varies with turbulence of the river flow and rainwater runoff.

In general, the raw water pH runs at 6.7 – 7 and has a fairly low alkalinity of 9 – 12 mg/l as CaCO₃. These traits mean the untreated water can be corrosive in nature, able to dissolve unwanted metals from the water delivery system in quantities exceeding the EPA requirements. Frequent jar testing is required to monitor the incoming water and to accurately dose Sodium Bicarbonate (alkalinity) and Zinc Orthophosphate (corrosion control) the critical tools to control these characteristics.



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Water Treatment Process

Four low lift pumps intake water from the Merrimack. Chlorine dioxide pre-sanitizer is dosed upon entry into the facility. pH is adjusted with 25% sodium hydroxide to optimize polyaluminum chloride (PAC) coagulant performance. The PAC dosage is determined by current turbidity level.

Following PAC addition, the water passes through a static mixer to a settling basin. The cleared water flows into a dual media filter and then through carbon filters for final organics and color removal. A post filtration adjustment with sodium hydroxide brings the pH to 7.7 – 8.0.

Sodium hypochlorite addition provides the terminal sanitation and fluoride is added.

The final additions are sodium bicarbonate, added to bring the alkalinity to 24 to 30 mg/L as CaCO₃ and Zinc Orthophosphate corrosion inhibitor.

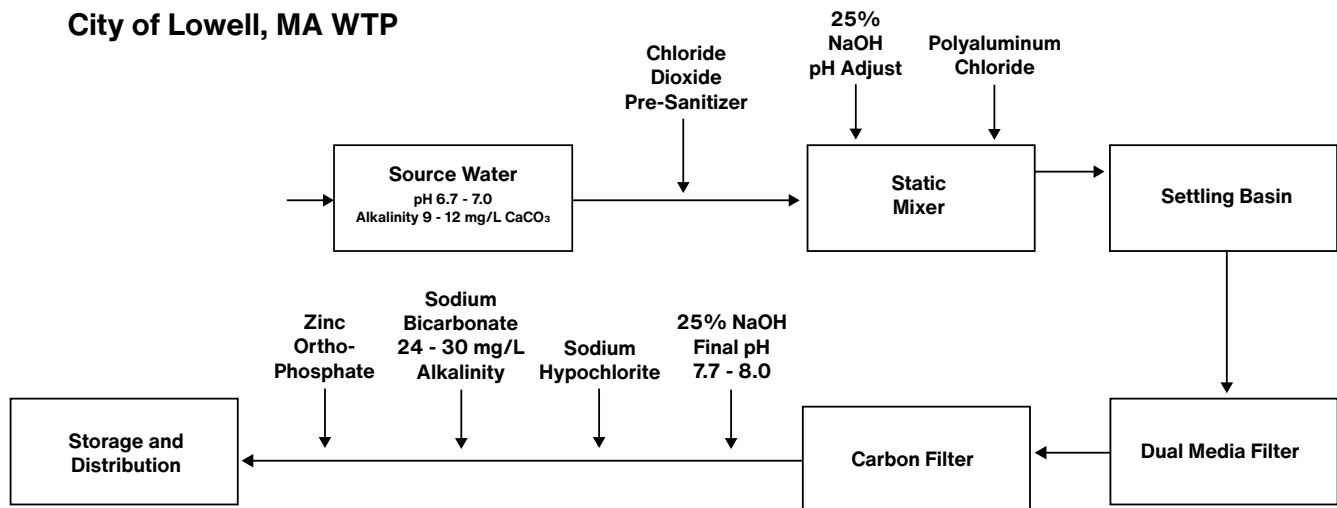
Storage in four tanks ranging in size from 0.5 million to 6 million gallons holds treated water for distribution.

Sodium Bicarbonate Storage and Handling

The City of Lowell requires 25 tons of sodium bicarbonate every 3 weeks. The bicarbonate is brought in via bulk pneumatic truck and off loaded to a silo located just outside the building. The bicarbonate is diluted in water prior to addition to the system. The water and bicarbonate additions and the mechanical mixing are controlled by a programmable logic system activated by operators on a regular schedule.

We extend our sincere thanks to the Operations team at Edmund F. Tarmey Water Utility, whose tireless efforts support the department's motto "Our Pride Flows".

City of Lowell, MA WTP



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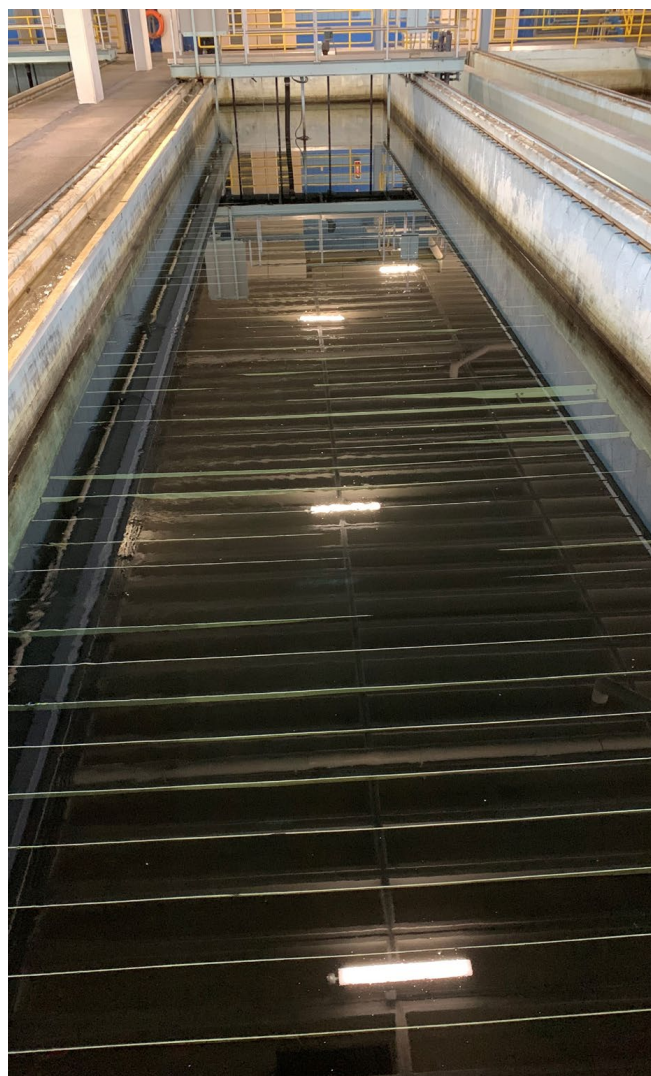
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For More Information

More information about the City of Lowell Water Treatment Facility can be found here: <https://www.lowellma.gov/645/Water-Utility>

For more information about using Arm & Hammer™ sodium bicarbonate for water treatment, click here: <https://www.ahperformance.com/markets/pools-water-treatment/potable-water/>



To contact technical support, find a distributor or request a sample visit:
www.ahperformance.com