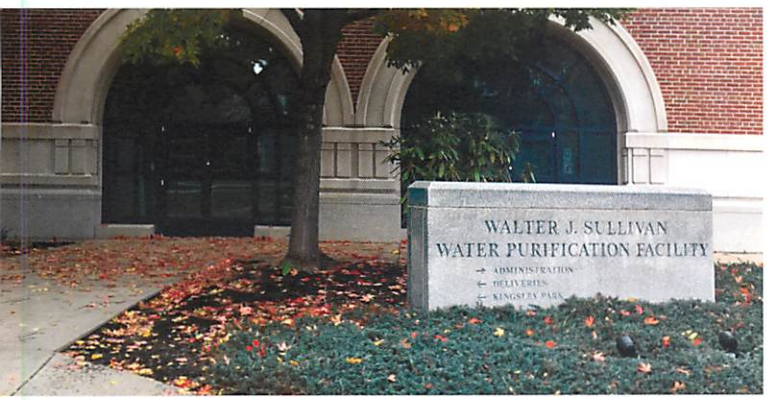
Cambridge Water Department

City of Cambridge



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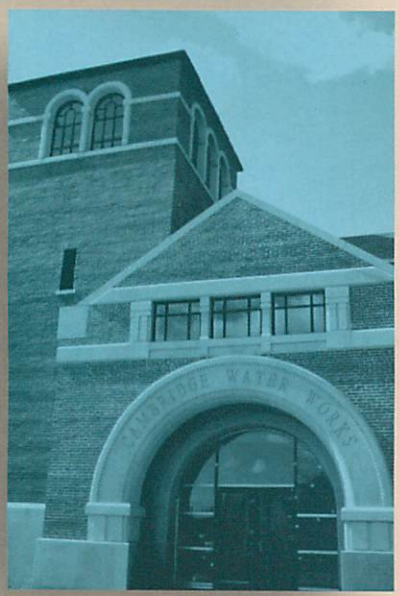
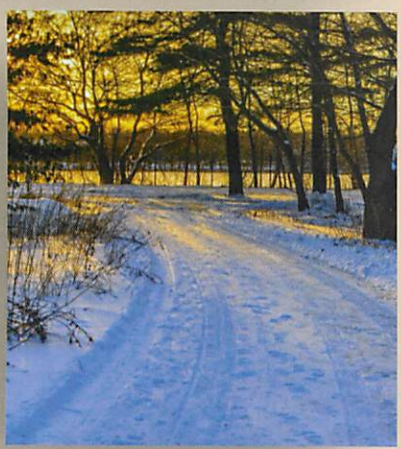




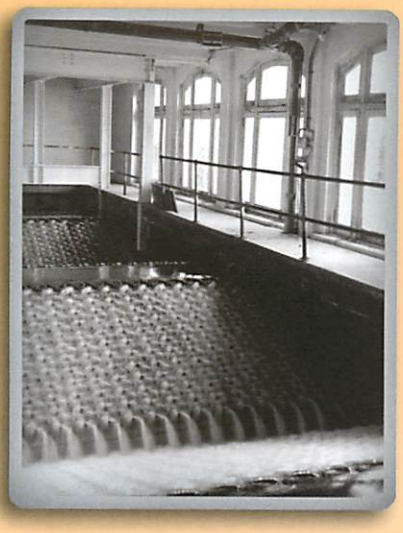
The City of Cambridge Water Department (CWD) has provided safe, reliable drinking water to residents and businesses since the mid-1800s. More than 150 years later, the Water Department delivers an average of 13 million gallons of the highest quality drinking water each day to nearly 114,000 residents and more than 5,000 businesses and schools. The Water Department is an agency of the city government under the general direction of the City Manager, who has delegated the day-to-day operation to the Managing Director. The Cambridge Water Board is comprised of five citizen members appointed by the City Manager to serve in an advisory capacity to the City Manager and the Managing Director.

The public water supply for the City of Cambridge begins in a series of protected upcountry reservoirs, flows to the Water Purification Facility at Fresh Pond for treatment, and finally throughout the distribution piping network to reach our customers.

Most of the water supply originates from two reservoirs – Hobbs Brook Reservoir (also known as Cambridge Reservoir) and Stony Brook Reservoir – located within the communities of Lexington, Lincoln, Waltham, and Weston. With a total storage capacity of 3.1 billion gallons, the two reservoirs collect water from a 24-square-mile (or 15,000 acre) watershed and store it for when it is needed. Water flows from Hobbs Brook Reservoir to Stony Brook Reservoir, and then travels 7.5 miles by gravity via the Stony Brook Conduit to Fresh Pond Reservoir in Cambridge. Water is treated at the Water Purification Facility, adjacent to Fresh Pond. After it is purified, the water is pumped to the 32-million-gallon Payson Park Reservoir in Belmont, which stores the water for daily use as well as emergencies. Because Payson Park Reservoir is located at a high elevation, water can be supplied by gravity throughout the City of Cambridge to our customers via our 190-mile piping network.

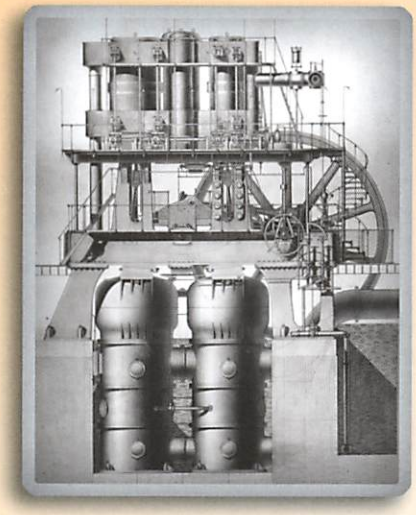
CWD is proud to provide the highest quality water to our customers

In 1923, on the shores of Fresh Pond, the largest water purification facility in New England went online.

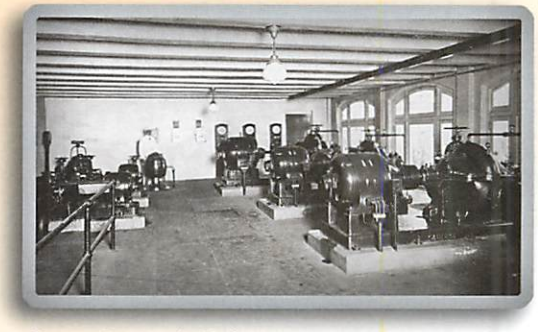


Aeration Cascade (1924)

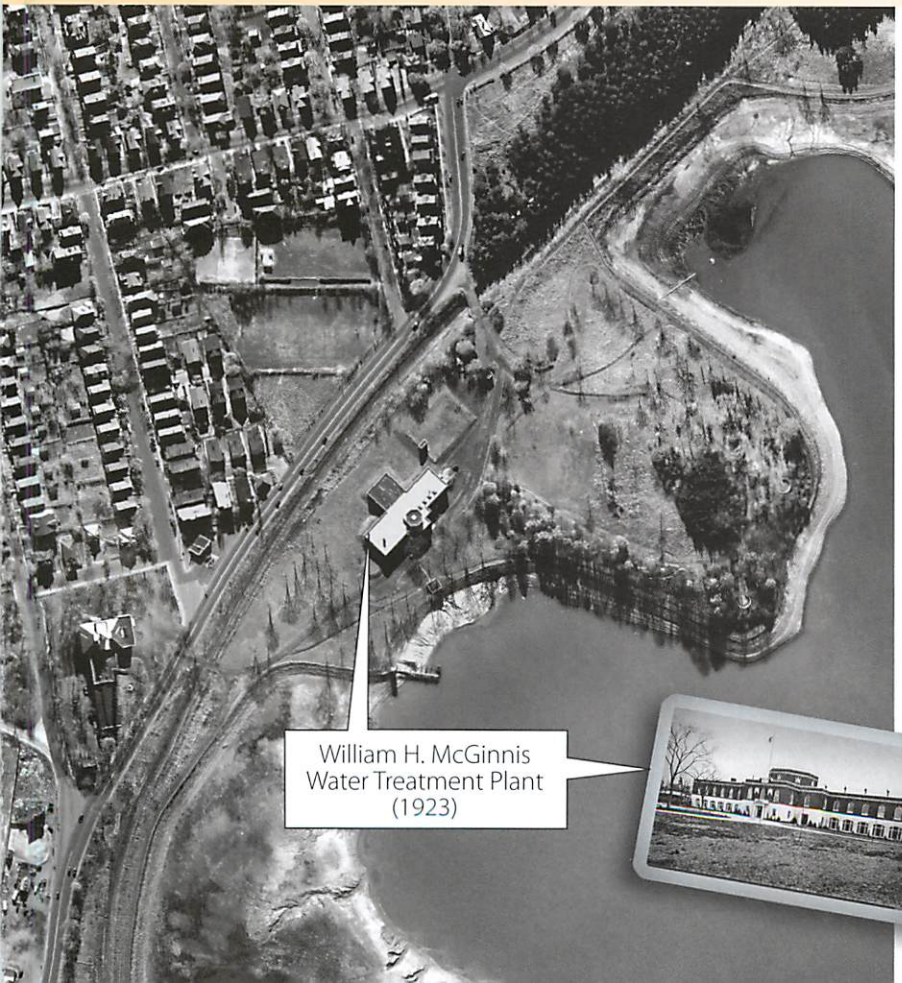
Laboratory (1924)



Original Steam Pump at Fresh Pond (c. 1800s)



Pump Room (1924)



From our past...

Public water supply was introduced to Cambridge in 1837 by the Cambridge Aqueduct Company, followed by the Cambridge Water Company in 1856. The City of Cambridge acquired both companies in 1865 to provide water to its 29,112 residents. By 1895, the City of Cambridge had grown to approximately 84,000 residents and had an average water consumption of about 6 million gallons per day. Until 1923, water from the Stony Brook and Hobbs Brooks reservoirs flowed by gravity to Fresh Pond, and was pumped directly into the distribution system. In 1923, on the shores of Fresh Pond, the largest water purification facility in New England went online. The William H. McGinnis Water Treatment Plant provided treatment and filtration of the raw water and through modifications and improvements, served the City over 75 years. In 2001, the Walter J. Sullivan Water Purification Facility replaced the original plant to ensure the highest quality water delivered to our customers through state-of-the-science treatment.

To the present...

Watershed

Drinking water for the City of Cambridge starts its journey in the watershed. Our reservoirs capture, store, and provide some natural treatment of the water. Because of the important role that forests and natural lands play in filtering pollutants and maintaining water quality, the Water Department utilizes land protection as part of a multiple-barrier approach to providing safe drinking water.

The Water Department has developed an award-winning program to preserve, protect, and manage the City's watershed and reservoirs from pollution and other potentially harmful contamination. Our progressive protection program includes:

- Maintaining and protecting city-owned lands;
- Developing and implementing watershed protection and emergency response plans;
- Developing partnerships with businesses and municipalities in the watershed;
- Conducting water quality monitoring and site monitoring; and
- Preserving and enhancing Fresh Pond Reservation for maintenance of water quality, natural green spaces, and wildlife habitat.

Together, these watershed protection activities provide the first barrier against contamination and are an integral part of the CWD's water quality protection strategy.

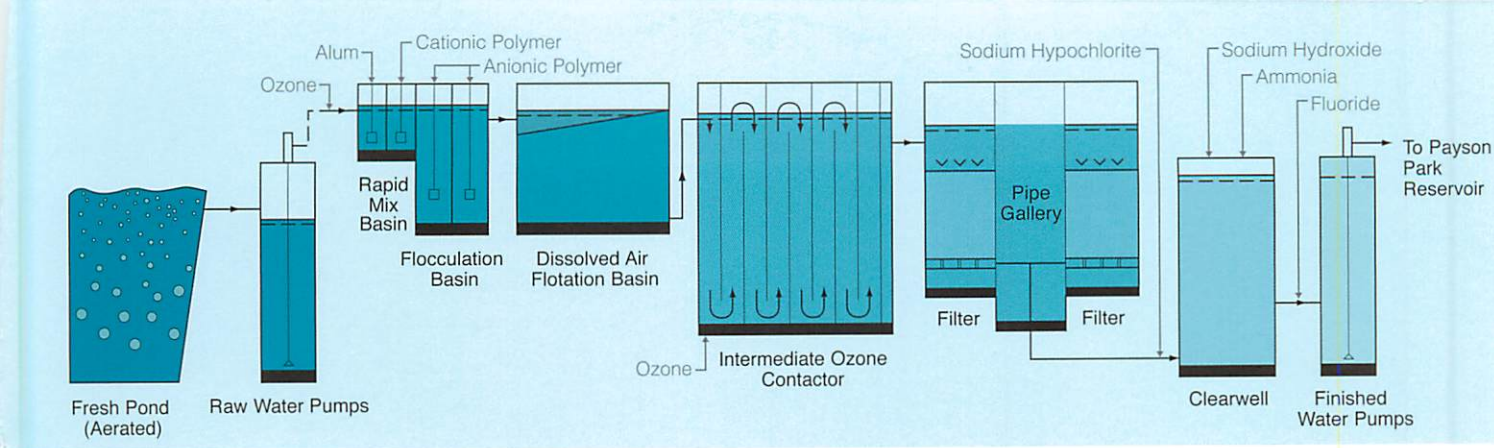
Water Purification Facility

With the Fresh Pond Reservation as a dramatic backdrop, the Walter J. Sullivan Water Purification Facility was completed in 2001 to provide the safest water to our customers. The 24-million-gallon-per-day facility replaced the 78-year old William H. McGinness Water Treatment Plant, located on the same site.

Our state-of-the-science purification facility reflects the community's desire to balance function and form. Aesthetically, the 154,000-square-foot facility (larger than the size of 2½ football fields) consolidates the treatment, maintenance, and administrative functions of the Water Department under one roof. The building's distinct architecture and landscaping is compatible with the Fresh Pond Master Plan and complements the historical, cultural, and recreational features of the Fresh Pond Reservation and surrounding area.

Technologically, the water from Fresh Pond Reservoir undergoes extensive treatment at the Cambridge Water Purification Facility using a combination of processes, shown at the top of the facing page.

The scientists at the Water Department's state-certified laboratory continuously monitor the effectiveness of the treatment process and make adjustments to the treatment as required.



Distribution System

From the purification facility, the treated drinking water is pumped to Payson Park Reservoir, located in the Town of Belmont. Payson Park Reservoir stores 32-million-gallons of water for both daily use and in case of an emergency. From Payson Park Reservoir, water flows by gravity

through nearly 190 miles of pipe that carries drinking water to every home, business, school, park, community garden, and fire hydrant in the city.

Gravity flow is highly reliable and energy efficient. The distribution piping network ranges in size from 4- to 30-inches in diameter.

The water used by our customers is measured by an Automated Meter Reading (AMR) system. Four times each day, the AMR system takes a real time reading from each water meter. This results in more accurate billing as well as early notification of potential leaks. If a high usage condition is detected, the Water Department contacts the property owner shortly thereafter. This early notification allows the owner to quickly make the necessary repairs, which lessens the impact on their Water and Sewer Bill and minimizes the amount of water that is leaking and wasted.

Safeguarding the Water

The Cambridge Water Department is committed to providing a safe and abundant supply of water to all of our customers. We utilize a multi-barrier approach to safeguard the quality of your water – from the source to your tap. Our watershed protection program is the first line of defense in protecting our source water from pollution and other potentially harmful contamination. We also conduct extensive water quality monitoring and routinely test samples throughout the entire the water system. The final line of defense is our cross-connection control program, which protects public health and the distribution piping network by addressing connections between drinking water and polluted sources. The synergistic effect of each of these barriers protects the integrity of the high quality water that we deliver to our customers.

and looking towards our future...

For the Earth

The Cambridge Water Department strives to be a good steward to our community and the Earth, and understands our role in the larger picture. To this end, the Water Department has investigated the sustainability of our operations as well as the impact of climate change on our water supply.

Sustainability

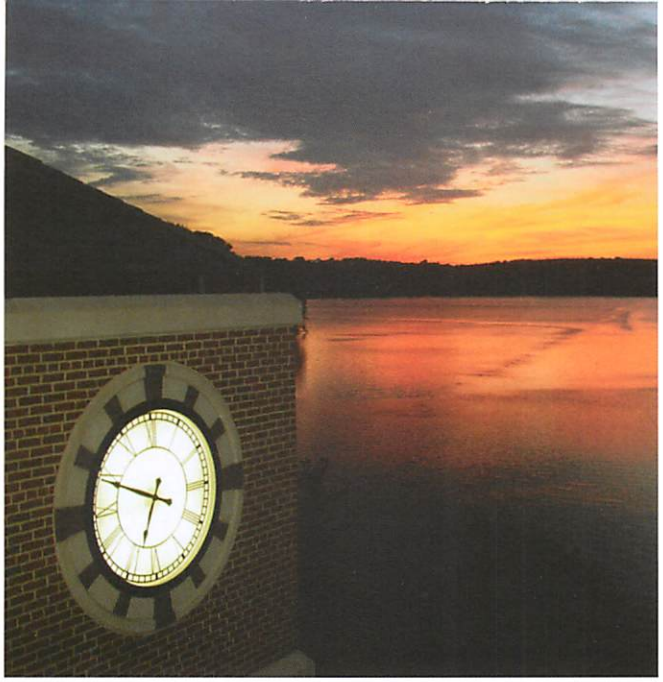
The Cambridge Water Department is routinely implementing new ways to minimize our footprint and increase energy efficiency while providing the highest quality drinking water. Acting as a good environmental steward, we are constantly optimizing the sustainability of our operations to save customers money.

In 2011, the Water Department undertook a comprehensive audit of the water purification facility, looking at hundreds of possible areas to save energy. Our efforts to date include:

- Our "Go Green" program, which decreased electricity demand charges by 20 percent and saved more than 5.4 percent in energy costs by modifying how we pump the water as well as light fixture relamping and replacement. The "Go Green" program earned the Cambridge Water Department the Public Water System Award for Energy Conservation from the Massachusetts Department of Environmental Protection!
- Installation of a rooftop solar photovoltaic system with a total of 561 high efficiency photovoltaic panels. Each panel has 72 cells and a maximum output of 305 Watts. There are 506 panels installed on the roof of the main building and 55 panels installed on the roof of the vehicle storage building. The total output of the system is 171.1 Kilowatts, and can even be tracked in real time online by our customers!
- Construction of valves and pumping system improvements. The raw water pumping system accounts for nearly 20 percent of the total energy used at the plant. The improvements are estimated to achieve $115,000 per year in energy savings. By looking at the raw water pumping system as a whole, an additional 46 percent in energy savings can be achieved by replacing selected valves in addition to just replacing the raw water pumps.

Climate Change

To further the City's preparations relative to climate change, the CWD has undertaken preparation of a Risk-Based Drought Management Plan (DMP). The DMP presents a drought risk analysis of the City's water supply to help improve understanding of reservoir system reliability. This provides the City an opportunity to plan in advance regarding the need for supplemental purchases from MWRA, based on storage volumes in the reservoirs at any given time.



Beyond Supplying Water

Public Outreach

The Cambridge Water Department works around the clock to make sure that safe, high-quality drinking water is always on tap. We are proud of the work we do and we like to share it with our community through plant tours, outreach, and volunteering. A few examples of our many programs:

- **Fresh Pond Day:** Every year, this event celebrates the land, water, wildlife, and people that make the Fresh Pond Reservation a unique and vital place through activities for all ages.
- **Water Purification Facility Tour:** Find out how water that falls as rain in the suburbs 10 miles west of Cambridge is transported to Fresh Pond and then tested, treated, and delivered to the City. The Director of Water Operations leads monthly tours of the City's beautiful purification facility. Visit our website for an event schedule.
- **Fresh Pond Stewards:** Learn to identify and effectively remove invasive plant species that degrade local ecosystems. Join Cambridge Water Department staff on a weekly basis during the growing season.

Fresh Pond Reservation

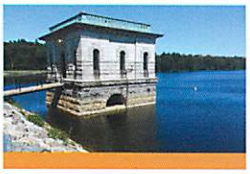
Fresh Pond Reservation is managed by the Water Department and consists of 162 acres of open space surrounding and protecting the 155-acre Fresh Pond Reservoir. A vital part of the drinking water supply system for the City of Cambridge, the Reservation is also an important open space for Cambridge residents and visitors. The Reservation also provides recreational opportunities of all kinds, including the chance for people to walk, cycle, run, birdwatching, picnic, walk dogs off leash, and be in a natural setting in the midst of the City. In addition, volunteer groups work to improve the health of the reservation. Nature programs are provided by the Water Department and the Friends of Fresh Pond.

To learn more about the water department and current initiatives, visit cambridgema.gov/water or the Friends of Fresh Pond website at friendsoffreshpond.org/index.htm

Cambridge Water Department Divisions

Administration

The Administration Division is responsible for administrative, financial, personnel, metering, cross connection, social media, and customer relations functions. The Division assists in the quarterly processing of water bills for approximately 15,000 metered accounts. The Division is also responsible for the Automated Meter Reading (AMR) System.



Watershed

The Watershed Division manages and maintains the drinking water supply reservoirs. Their work includes watershed protection, environmental monitoring, and managing Fresh Pond Reservation, Cambridge's largest open space.

Distribution

The Distribution Division installs, repairs, and continually improves the vast network of water pipes to reliably deliver water to our customers. The City's 190 miles of transmission and distribution mains range in size from 4- to 63-inches, with more than 1,700 fire hydrants, 4,450 valves, 18,300 valve boxes, and 14,060 water services.

Water Operations

The Water Purification Facility and laboratory are operated by the Water Operations Division. This division oversees the day-to-day water treatment processes, conducts hundreds of tests to monitor the quality of the water, and ensures compliance with all drinking water regulations.

Engineering

The Engineering Division assists other Division Managers with the Water Department capital improvement program. This division also keeps maps and records up-to-date, including the Geographic Information System (GIS), uses complex models to analyze the transmission and distribution system piping network, as well as coordinates construction work with other city departments.

Contact Us

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Director of Engineering and Distribution Operations:
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Director of Water Operations:
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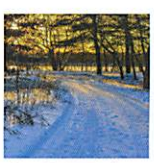

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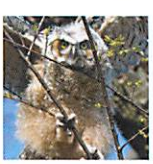

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