

Repairing the Delaware Aqueduct

Facts on the Delaware System, the repair, and plans for the aqueduct shutdown



Above: Engineers walk through the new Delaware Aqueduct Bypass Tunnel for an inspection in 2020.

For more than a decade, the New York City Department of Environmental Protection (NYCDEP) has been working on a large capital project to repair two leaks in the Delaware Aqueduct. It is the largest repair project in the 180-year history of New York City's water supply system. NYCDEP will be taking the Delaware Aqueduct out of service for 5-8 months, starting in the autumn of 2022, to complete the repair.

The following is a brief summary of the project, and a description of how NYCDEP will operate its Delaware River Basin reservoirs during the aqueduct shutdown.

About New York City's water supply system

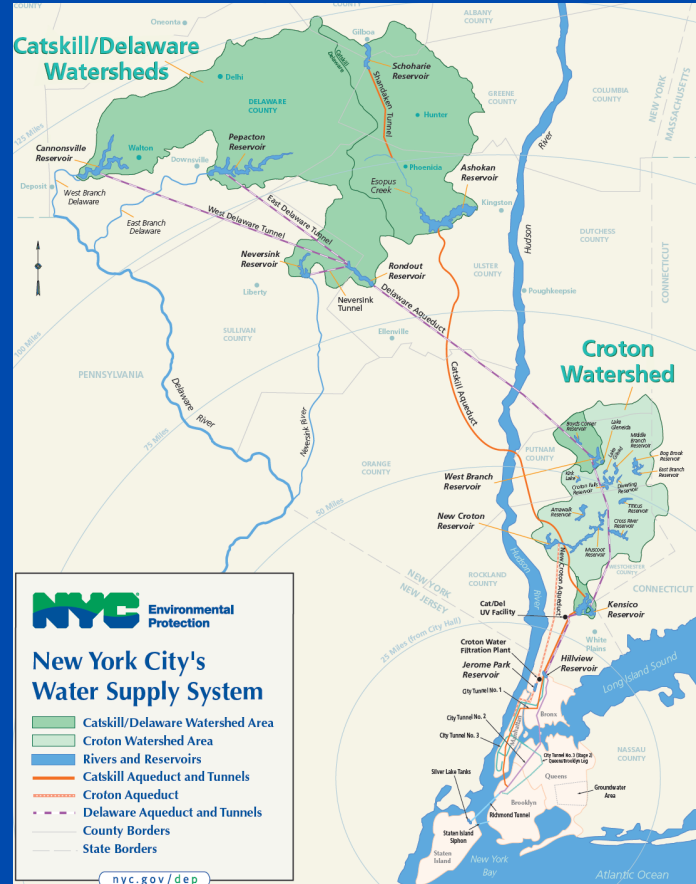
- New York City's water supply comprises three separate reservoirs systems – Croton, Catskill and Delaware.
- The system provides 1.1 billion gallons of drinking water each day to nearly 10 million people, including those in New York City and more than 70 communities north of the city.
- It is the largest municipal water supply system in the United States.
- The reservoir system includes three reservoirs on the headwaters of the Delaware River, which supply most of the water in the city's Delaware System.

About the Delaware System

- The Delaware System includes three reservoirs on the headwaters of the Delaware River – Neversink, Pepacton and Cannonsville.
- Those reservoirs send water through dedicated tunnels to Rondout Reservoir, from which the water is delivered to New York City through the 85-mile-long Delaware Aqueduct.
- The Delaware Aqueduct is the longest continuous tunnel in the world.
- The aqueduct was put into service in 1944.
- The Delaware Aqueduct delivers about 500-600 million gallons of water to communities each day.
- NYCDEP is required to release water downstream from its Delaware River Basin reservoirs on a continuous basis. The amount of water released is determined by a number of court decrees, interstate agreements and other regulations.

About the Delaware Aqueduct repair project

- The Delaware Aqueduct leaks in two locations – near the Hudson River in Newburgh, and in the Ulster County hamlet of Wawarsing.
- NYCDEP has been working for nearly two decades on the design and implementation of a repair project to fix both leaks. Construction work on the projects began about 10 years ago.
- The largest leak, in Newburgh, is being repaired through the construction of bypass tunnel that will connect to structurally sound portions of the existing Delaware Aqueduct and convey water around its leaking section.
- The Delaware Aqueduct Bypass Tunnel is 2.5 miles long and roughly 600 feet below the Hudson River.
- NYCDEP has finished the excavation of the bypass tunnel, and lined it with steel and concrete.
- NYCDEP must shut down the Delaware Aqueduct for 5-8 months to connect the new bypass tunnel to the existing aqueduct on both sides of the Hudson River.
- The shutdown and connection is scheduled to begin in October 2022 and continue through the spring of 2023.
- NYCDEP has performed capital projects on other parts of its water supply system, complex modeling, and dozens of other tasks to ensure the system and the city are prepared for the Delaware Aqueduct shutdown.



The map above shows New York City's reservoir system. The three westernmost reservoirs were built on the headwaters of the Delaware River.

Delaware System operations during the aqueduct shutdown

- NYCDEP will change the operation of its Delaware System reservoirs before and during the aqueduct shutdown.
- Its three Delaware Basin reservoirs – Neversink, Pepacton and Cannonsville – will not convey water to Rondout Reservoir during the Delaware Aqueduct shutdown.
- NYCDEP expects to substantially draw down those reservoirs ahead of the shutdown by relying on more Delaware System water before the aqueduct is taken out of service.
 - Depending on rainfall, NYCDEP expects to draw down those three reservoirs by 30 percent or more ahead of the shutdown.
 - Using more water from our Delaware System will also allow the city's other reservoir systems, Croton and Catskill, to remain full and support our customers while the Delaware Aqueduct is out of service.
- Storage in our Delaware Basin reservoirs will be regulated through the use of their release valves during the aqueduct shutdown.
 - This will likely result in larger cold-water releases before and during the Delaware Aqueduct shutdown.
- NYCDEP will continue to meet all its release requirements, including those outlined in the 1954 U.S. Supreme Court Decree and the 2017 Flexible Flow Management Program, while the aqueduct is out of service.
- NYCDEP will use the release works to meet the Conditional Seasonal Storage Objective (CSSO) at its three Delaware Basin reservoirs. The CSSO sets storage targets throughout the year, creating space in the reservoirs to catch melting snow and spring rain.
- Although NYCDEP will operate the reservoirs to minimize their likelihood of filling and passing water through their spillways, there is always a chance that large runoff events could happen during the Delaware Aqueduct shutdown.
- Independent studies and decades of gage data show that the reservoirs do not cause flooding when they spill. Their dams always provide significant attenuation of peak flows from large storms and runoff events.
 - This fact has been proven and reiterated in a number of independent studies by the U.S. Army Corps of Engineers, U.S. Geological Survey, National Weather Service and others.

**Pepacton Reservoir**