



## NEW YORK CITY 2003 DRINKING WATER SUPPLY AND QUALITY REPORT

*The New York City Department of Environmental Protection (DEP) is pleased to present its 2003 Annual Water Quality Report. This presentation is in accordance with Part 5-1.72 of the New York State Sanitary Code (10NYCRR), and the National Primary Drinking Water Regulations, 40 CFR Part 141 Subpart O, of the United States Environmental Protection Agency (EPA), which require all drinking water suppliers to provide the public with an annual statement describing the water supply and the quality of its water.*

### **New York City's Water System**

The New York City surface (reservoir) water supply system provides approximately 1.2 billion gallons of safe drinking water daily to over 8 million residents of New York City, approximately one million people living in Westchester, Putnam, Ulster, and Orange counties, as well as millions of tourists and commuters who visit the City throughout the year. In addition to our surface water supplies, approximately 350,000 people in southeastern Queens receive groundwater or a blend of groundwater and surface water. In all, the City system supplies high quality water to nearly half the population of New York State.

New York City's surface water is supplied from a network of 19 reservoirs and three controlled lakes in a 1,972 square-mile watershed that extends 125 miles north and west of New York City. Approximately 90% of our water comes from the Catskill/Delaware System (Public Water System Identification Number [PWSID] NY7003493), located in Delaware, Greene, Schoharie, Sullivan, and Ulster counties. The Croton System (PWSID NY7003666), the City's original upstate supply, normally provides about 10% of our daily water from 12 reservoir basins in Putnam, Westchester, and Dutchess counties. In 2003, the Groundwater System (PWSID NY7011735) in southeastern Queens supplied a daily average of 9 million gallons of drinking water from 13 wells, less than 1% of the City's total usage.

DEP's Bureau of Water Supply is responsible for the collection, conveyance and treatment of water from the upstate reservoirs into the City, as well as monitoring drinking water quality in the distribution system. The Department's Bureau of Water and Sewer Operations is responsible for the operation and maintenance of the

water distribution system, which delivers water to City residents and provides fire protection, as well as the sewer system, which collects "used" water, sanitary sewage, and storm water and transports this flow to the City's wastewater treatment plants. DEP's Bureau of Wastewater Treatment is responsible for the operation of the City's wastewater treatment plants and related infrastructure to ensure that treated water released back into the environment is safe and meets high water quality standards.

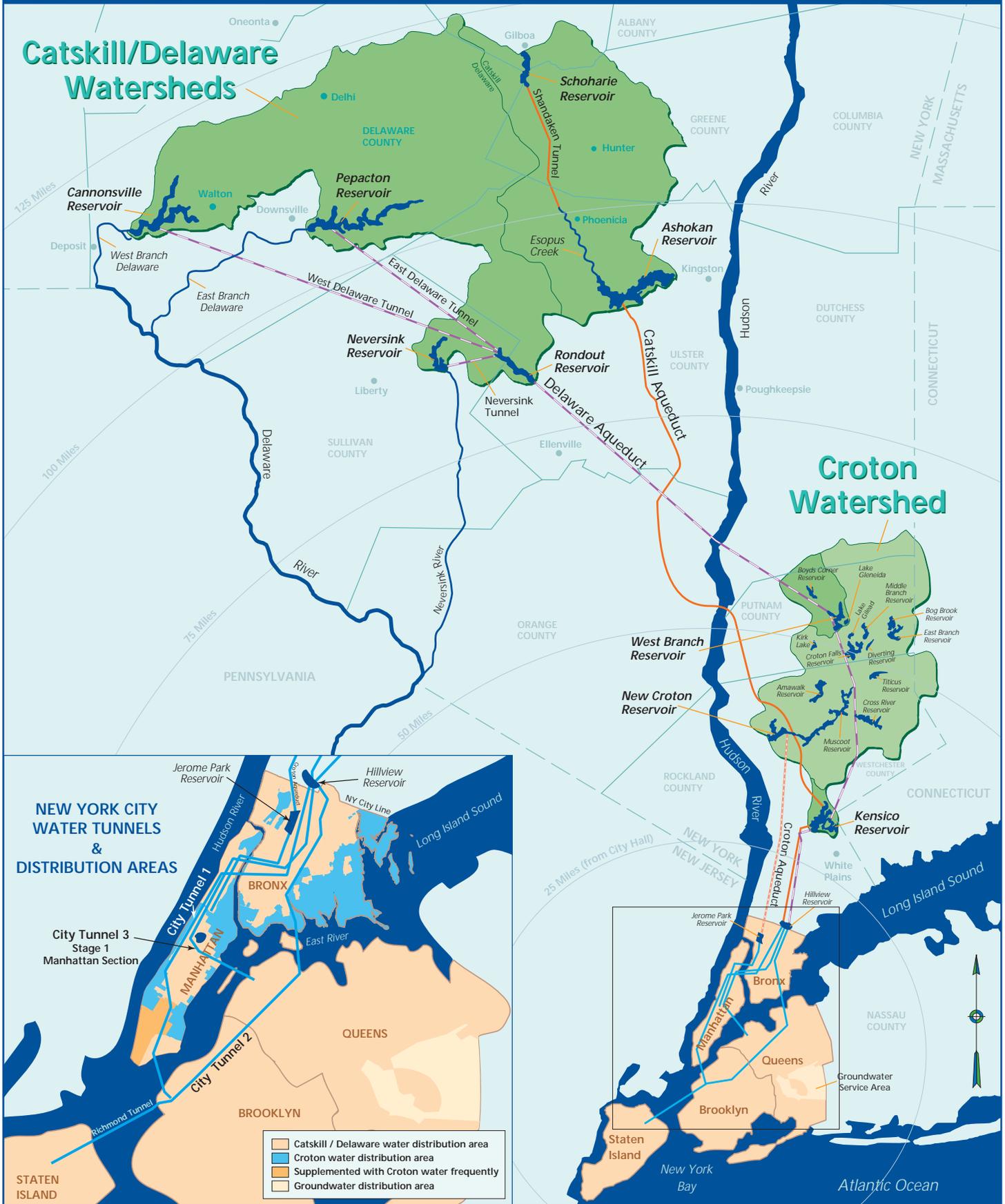
### **New York City's Water Distribution and Sewer Systems**

The City's water distribution infrastructure consists of 2 distribution reservoirs (Jerome Park Reservoir in the Bronx and Hillview Reservoir in Yonkers), 3 major in-City water tunnels, 8 drinking water pumping stations, 45 groundwater wells, the world's two largest underground storage tanks, 6,890 miles of water main, 217,477 valves, and 109,100 fire hydrants. The sewer system is comprised of 6,484 miles of sewer mains and 140,000 catch basins.

Within New York City, DEP's Bureau of Water and Sewer Operations (BWSO) is responsible for the operation, maintenance and protection of the water distribution system, the stormwater and sewer collection systems, the protection of adjacent waterways and natural drainage systems, and the planning and execution of DEP's Capital Water and Sewer Infrastructure Program. The Bureau's 1300 employees include water and sewer field workers, engineers, operators, machinists, electricians, plumbers, metallurgists, inspectors, and administrators. Their efforts include the following activities:



# New York City's Water Supply System





Water Main Break Repair

### ***Response to Water Main Breaks and Leakage***

Typically, DEP responds to approximately 600 water main breaks per year, and hundreds more reported leaks. Water main breaks may be caused by a number of factors acting either alone or in concert on a water pipe. These factors include concentrated loading from contact with other structures, non-uniform or disrupted fill around the pipe, extreme cold, vibrations, traffic loading, corrosive soils, leakage, manufacturing defects, water pressure changes, stray electrical currents and construction activity around the pipe. Over the past few decades, DEP and its construction agent, the NYC Department of Design and Construction, have improved the materials, installation practices and coordination of subsurface construction with other utilities to minimize the future occurrence of water main breaks and leaks.

Leak detection – a program using sonar equipment to identify leaks in water supply piping prior to a full break – has aided city-wide conservation efforts. In FY 2003, the Leak Detection Unit was able to locate and address leaks in the system that amounted to an estimated 60 million gallons of water per day.



Leak Detection

### ***Sewer Backups***

Sewer backups occur when sewers or sewer connections break or become clogged by tree roots, cooking grease, or large insoluble items which may be flushed down a toilet. In addition, because of the combined nature of New York's sewer system, street litter may become mixed with household sewage to block a sewer main. Because sewer back-ups may affect the health of City residents or cause property damage, DEP's rapid response to these complaints is critical; 99.7% of all sewer back-ups are resolved in less than 24 hours. Over the past twenty years, DEP's initial response time to these complaints has been reduced by more than 50%, from approximately 9 hours in 1983 to 4 hours in 2003.

### ***Catch Basin Maintenance and Cleaning***

Catch basins are structures placed at street intersections or other low points in the street system to capture rain-water or snow melt and convey the water to either a sewage treatment plant or local waterway.

Approximately 70% of New York City's sewer system is combined, with sanitary and storm flow moving through the same mains. Usually, both sanitary sewage and storm water are carried by the sewer system to one of the City's 14 wastewater treatment plants. During periods of significant rainfall, however, the combined flow of sanitary and storm water can be greater than the capacity of the treatment plants; when this occurs, untreated wastewater may be released from the sewer system into local water bodies.



Catch Basin Cleaning

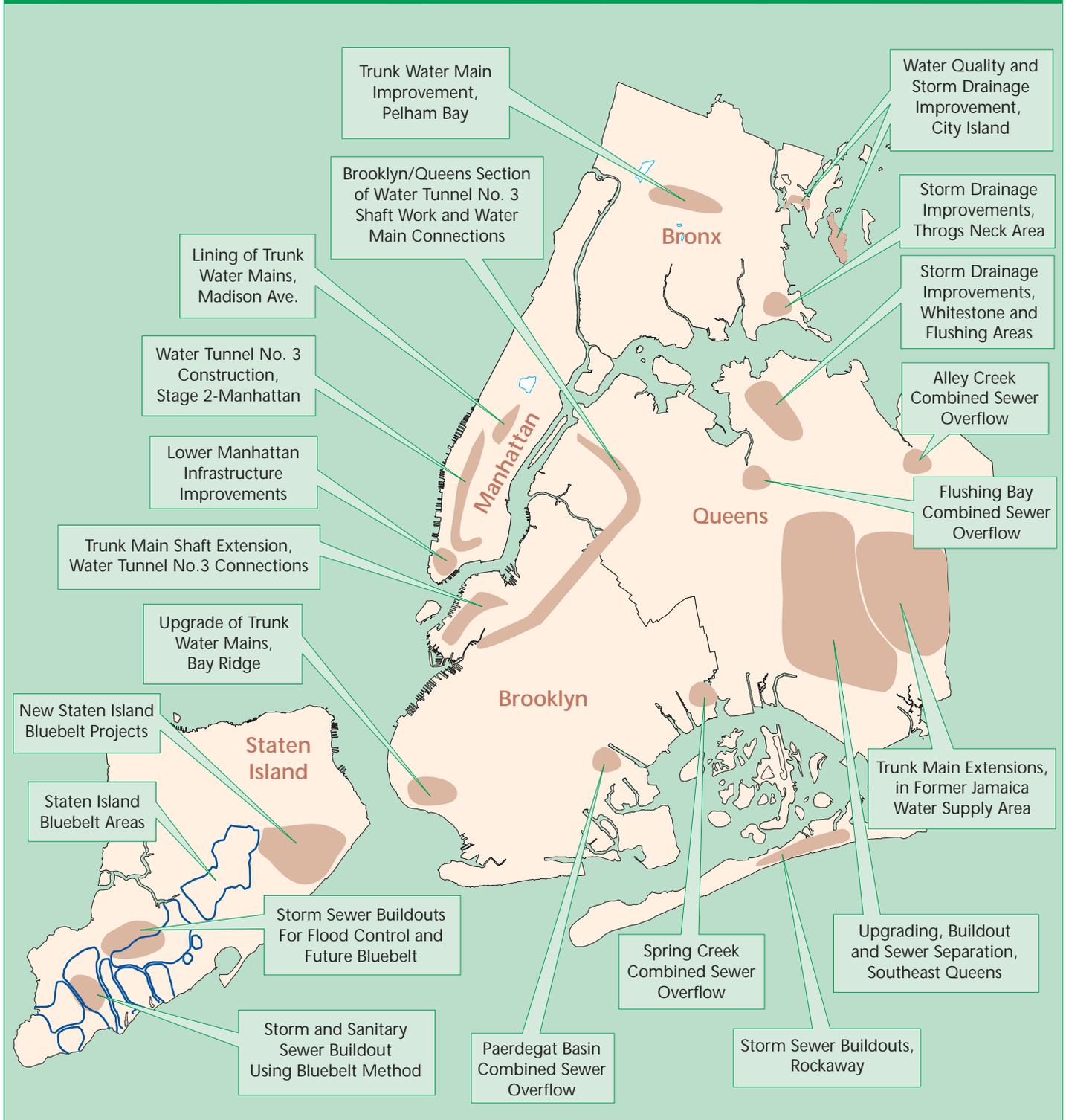
Since catch basins are so critical to prevent street flooding, it is important for the inlet gates to remain free of fallen leaves, street trash, and other floatables. In order to ensure the efficient operation of catch basins, DEP cleans the basins regularly to prevent them from becoming filled with debris. DEP's responsiveness to catch basin complaints and service requests has increased dramatically over the past two decades. For example, the backlog of catch basin complaints has been reduced by 93%, and the number of catch basins cleaned annually has increased by 67%.

### ***System Improvements***

DEP plans to invest \$350 million annually for the next ten years to upgrade and maintain the City's water and sewer infrastructure. In addition to this programmatic work, DEP is working to provide several major enhancements to the City's drinking water and sewer infrastructure.



NEW YORK CITY DEPARTMENT OF ENVIRONMENTAL PROTECTION  
MAJOR CAPITAL INFRASTRUCTURE PROJECTS  
Fiscal Years 2003 - 2005





Tunnel No. 3 Construction

### ***City Water Tunnel No. 3***

Construction continues on City Tunnel No. 3, one of the largest capital construction projects in New York City's history. Tunnel No. 3 is expected to enhance and improve the City's water delivery system and, once completed, allow for inspection and repair of City Tunnels No. 1 and 2 for the first time since they were put into service in 1917 and 1937, respectively. Begun in 1970, work is currently proceeding in Brooklyn and Queens and tunneling for the Lower Manhattan leg was initiated in 2003. Additionally, conceptual planning work for a new Kensico-City Tunnel (KCT) was completed in October 2003. The KCT will originate at Kensico Reservoir and connect to the distribution system in the Bronx. Once complete, this aqueduct will supplement the capacity of the three other aqueducts carrying water into the City from the upstate reservoirs.

### ***Southeast Queens Groundwater Improvements/Aquifer Storage and Recovery***

In the early 1990s, DEP embarked upon a broad program to integrate New York City's surface water supply from the City's upstate reservoirs with the groundwater supplied by the aquifer system below southeastern Brooklyn and Queens. Historically, the Jamaica Water Supply Company (JWS), a privately operated water supply company, served the communities of southeast Queens. In 1996, New York City purchased JWS and took responsibility for the delivery of drinking water to the community.

After years of community concern over declining groundwater quality under JWS management, the City was charged with improving water quality in the region. After several years of evaluation and design, in 2003, DEP completed installation of granular activated carbon filters at nine wells that had been unused due to the presence of contaminants. After these improvements were completed, four of the wells were run into distribution for two weeks each. Additionally, to evaluate the

expanded use of the groundwater supply, DEP constructed a pilot filtration plant to demonstrate several different methods of filtration that could be used to treat water being taken from the wells; results from the pilot plant are promising and design of the full-scale plant is expected to begin in 2004.

In addition to improving the supply of groundwater from Queens' aquifers through filtration, DEP is investigating the possibility of accessing an additional groundwater supply: the Lloyd Aquifer. Working with regional agencies, DEP is developing an Aquifer Storage and Recovery (ASR) project. Currently, the Lloyd Aquifer's resources are depleting, mainly due to a rate of consumption by Long Island communities, which is greater than the aquifer's natural rate of recharge. ASR would help to replenish the Lloyd Aquifer by injecting surplus water from New York City's upstate surface water reservoirs into the aquifer. This water would be stored in the aquifer and, when necessary, the City could extract a portion of this additional potable water to supplement its drinking water supply.

This process will benefit the City, as well as communities on Long Island. New York City will benefit from a new in-City drinking water supply – one created without many of the attendant construction costs and community disturbances involved in traditional capital projects, and, most importantly, one that allows us to have a temporary alternate water supply in case of an emergency, such as a drought or the need to shut down one of the City's three aqueducts. The injection process will have an added benefit in that it will recharge the aquifer. This recharging process would help to stabilize the Aquifer's salt front, protecting Long Island beach communities' underground drinking water from salinization, which is a long-term threat to their supply.

### ***The Bluebelts of Staten Island***

The Staten Island Bluebelt system provides ecologically sound and cost-effective storm water management by



Staten Island Bluebelt Restoration And Beautification