

NEW YORK CITY 1999 DRINKING WATER SUPPLY AND QUALITY REPORT



www.ci.nyc.ny.us/dep

Rudolph W. Giuliani, Mayor

Joel A. Miele Sr., P.E., Commissioner



New Croton Reservoir

NEW YORK CITY 1999 DRINKING WATER SUPPLY AND QUALITY REPORT

The New York City Department of Environmental Protection is pleased to present its 1999 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 Environmental Protection Agency, 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 Supply

The New York City surface (reservoir) water supply system (PWSID NY0003493) provides approximately 1.3 billion gallons of safe drinking water daily to nearly 8 million residents of New York City, as well as visitors, commuters and approximately one million people living in Westchester, Putnam, Ulster, and Orange counties. 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.

Where Does New York City's Water Come From?

New York City's surface water is supplied from a network of 19 reservoirs and three controlled lakes in a 1,969 square-mile watershed that extends 125 miles north of New York City. Approximately 90% of our water comes from the Catskill/Delaware System, located in Delaware, Greene, Schoharie, Sullivan, and Ulster counties, west of the Hudson River. The Croton System, the City's original upstate supply, provides about 10% of our daily water from 12 reservoir basins in Putnam, Westchester, and Dutchess counties. In 1999, New York City's Groundwater System in southeastern Queens operated 20 wells and supplied an average of 20 million gallons of drinking water per day, or less than 2% of the City's total use.

What's in Source Water?

Sources of drinking water worldwide (both tap water and bottled water) include rivers, lakes, streams, ponds, reservoirs, springs, and wells. As water travels over the surface of the land or through the ground, it dissolves naturally-occurring minerals and, in some cases, radioactive material, and can pick up substances resulting from the presence of animals or from human activities. Contaminants that may be present in source water include: microbial contaminants; inorganic contaminants; pesticides and herbicides; organic chemical contaminants; and radioactive contaminants.

Regulation of Drinking Water

In order to ensure that tap water is safe to drink, the New York State Department of Health and the United States Environmental Protection Agency (EPA) prescribe regulations which limit the amount of certain contaminants in water provided by public water systems. The State Health Department's and the federal Food and Drug Administration's regulations establish limits for contaminants in bottled water.

Drinking water, including bottled water, may reasonably be expected to contain at least small amounts of some contaminants. The presence of contaminants does not necessarily indicate that water poses a health risk. More information about contaminants and potential health effects can be obtained by calling the EPA's Safe Drinking Water Hotline (800) 426-4791.

New York City's Water Supply System

Catskill/Delaware Watersheds

Croton Watershed



- Catskill / Delaware Watershed Area
- Croton Watershed Area
- Rivers and Reservoirs
- Catskill Aqueduct and Tunnels
- Croton Aqueduct
- Delaware Aqueduct and Tunnels
- County Borders
- State Borders

www.ci.nyc.ny.us/dep

NYCDEP/BW&SO/AJ 3/00

Water Quality

The New York City Department of Environmental Protection (DEP) operates the water supply system that delivers water to City residents. DEP's monitoring program — far more extensive than required by law — demonstrates that the quality of New York City's drinking water remains high and meets all health-related State and federal drinking water standards. Color, an aesthetic condition in the Croton and Groundwater Systems, may exceed the standard on a seasonal basis.



DEP monitors the water in the distribution system, the upstate reservoirs and feeder streams, and the wells that are the sources for our supply. Water quality is monitored continuously as the water enters the distribution system, and is regularly tested at sampling points throughout the entire City. DEP conducts analyses for a broad spectrum of microbiological, chemical, and physical measures of quality. In 1999, DEP collected more than 41,500 in-City samples and performed approximately 594,300 analyses.

Test Results

The results of the tests conducted in 1999 on distribution water samples under DEP's Distribution System Monitoring Program are summarized in the tables in this Statement. Data is presented separately for the Croton, Catskill/Delaware, and Groundwater Systems. Whether a particular user receives Croton, Catskill/Delaware, groundwater, or a mixture, depends on location, system operations, and consumer demand.

The State requires monitoring for some parameters at a frequency of less than once per year because the concentrations of these parameters do not change frequently. Accordingly, some of these data, though representative, are more than one year old. Unregulated parameter monitoring is conducted to help EPA determine where certain parameters occur and whether it needs to regulate those parameters.

Recently, considerable attention has been focused on the chemical MTBE (methyl tertiary butyl ether), an oxygenate widely used in the United States as a gasoline fuel additive. In the U.S., MTBE has been found mainly in ground water supplies as a result of leaking gasoline storage tanks and pipelines. The potential for MTBE groundwater contamination is exacerbated by its solubility in water, which allows it to travel through groundwater aquifers faster than the other, less soluble, components of gasoline. The chemical has also been detected at much lower levels in surface water supplies, due more to air emissions and recreational power boating, than to leaking underground storage tanks. Even though the State does not require water supplies to monitor for MTBE, DEP has made it part of its analytical protocol since 1996.

Lead in Drinking Water

New York City water is lead-free when it is delivered from the City's upstate reservoir system, but water can absorb lead from solder, fixtures, and pipes found in the plumbing of some buildings or homes. Mandated at-the-tap lead monitoring is conducted at various households around the City twice a year. Based on the results of the 1999 monitoring of 107 homes, New York City met the established standard or Lead Action Level (AL).

Infants and young children are typically more vulnerable to lead in drinking water than the general population. It is possible that lead levels at your home may be higher than at other homes in the community as a result of materials used in your home's plumbing. If you are concerned about elevated lead levels in your home's water you may flush your cold-water tap for 30 seconds to 2 minutes, until the water turns cold, before using water that has been standing in the pipes for more than six hours. Use only water from the cold water tap for cooking, drinking, and making baby formula. You also may wish to have your water tested. To request a free kit to test for lead in your drinking water, call DEP's 24-hour Help Center at (718) DEP-HELP. Additional information is available from the EPA's Safe Drinking Water Hotline (800) 426-4791.





Cryptosporidium and *Giardia*

While there is no evidence of illness related to the New York City water supply, federal and New York State law requires all water suppliers to notify their customers about the potential risks of *Cryptosporidium* and *Giardia*. Cryptosporidiosis and giardiasis are intestinal illnesses caused by microscopic pathogens which can be waterborne. Symptoms of infection include nausea, diarrhea, and abdominal cramps. Most healthy individuals can overcome both of these diseases within a few weeks.

According to the EPA and the Centers for Disease Control and Prevention (CDC), it is unclear how most cases of cryptosporidiosis in the United States are contracted. The relative importance of various risk factors are unknown. Such factors include eating contaminated food, swallowing contaminated recreational water while swimming or camping, contact with animals, contact with human waste, certain sexual practices, or drinking contaminated water. Individuals who think they may have cryptosporidiosis or giardiasis should contact their health care provider immediately.

Some people may be more vulnerable to disease-causing microorganisms or pathogens in drinking water than the general population. Immuno-compromised persons, such as persons with cancer undergoing chemotherapy, persons who have undergone organ transplants, people with Crohn's disease or HIV/AIDS or other immune system disorders, some elderly, and infants, can be particularly at risk from infections. These people should seek advice from their health care providers about their drinking water. EPA/CDC guidelines on appropriate means to lessen the risk of infection by *Cryptosporidium*, *Giardia* and other microbial contaminants are available from the EPA's Safe Drinking Water Hotline (800) 426-4791.

DEP's Monitoring for Pathogens

In 1992, the City added a pathogen monitoring component to its comprehensive watershed monitoring program. Since then, samples have been collected weekly from the effluents of Kensico and New Croton Reservoirs, before water is first chlorinated in the Catskill/Delaware and Croton Systems, respectively. In May 1999, DEP implemented a more sensitive analytical method which improved the Department's ability to detect both *Giardia* cysts and *Cryptosporidium* oocysts. Current test methods, however, are limited in that they do not allow us to determine if organisms identified are dead or if they are capable of causing disease.

In 1999, as part of the routine sampling program, 109 samples of Kensico Reservoir effluent and 37 samples of New Croton Reservoir effluent were collected and analyzed for *Giardia* cysts and *Cryptosporidium* oocysts. Of the 109 Kensico Reservoir samples, 47 samples were presumed positive for *Giardia* and 5 samples were confirmed positive. Five samples were presumed positive for *Cryptosporidium* at Kensico and two were confirmed. The New Croton Reservoir samples produced seven presumed positive *Giardia* samples, and no samples confirmed positive; and of two presumed positive *Cryptosporidium* samples no samples confirmed positive. DEP's *Giardia* and *Cryptosporidium* data from 1992 to the present can be viewed on our web site www.ci.nyc.ny.us/dep/html/pathogen.html, where updates are made weekly.




How is New York City's Water Treated?

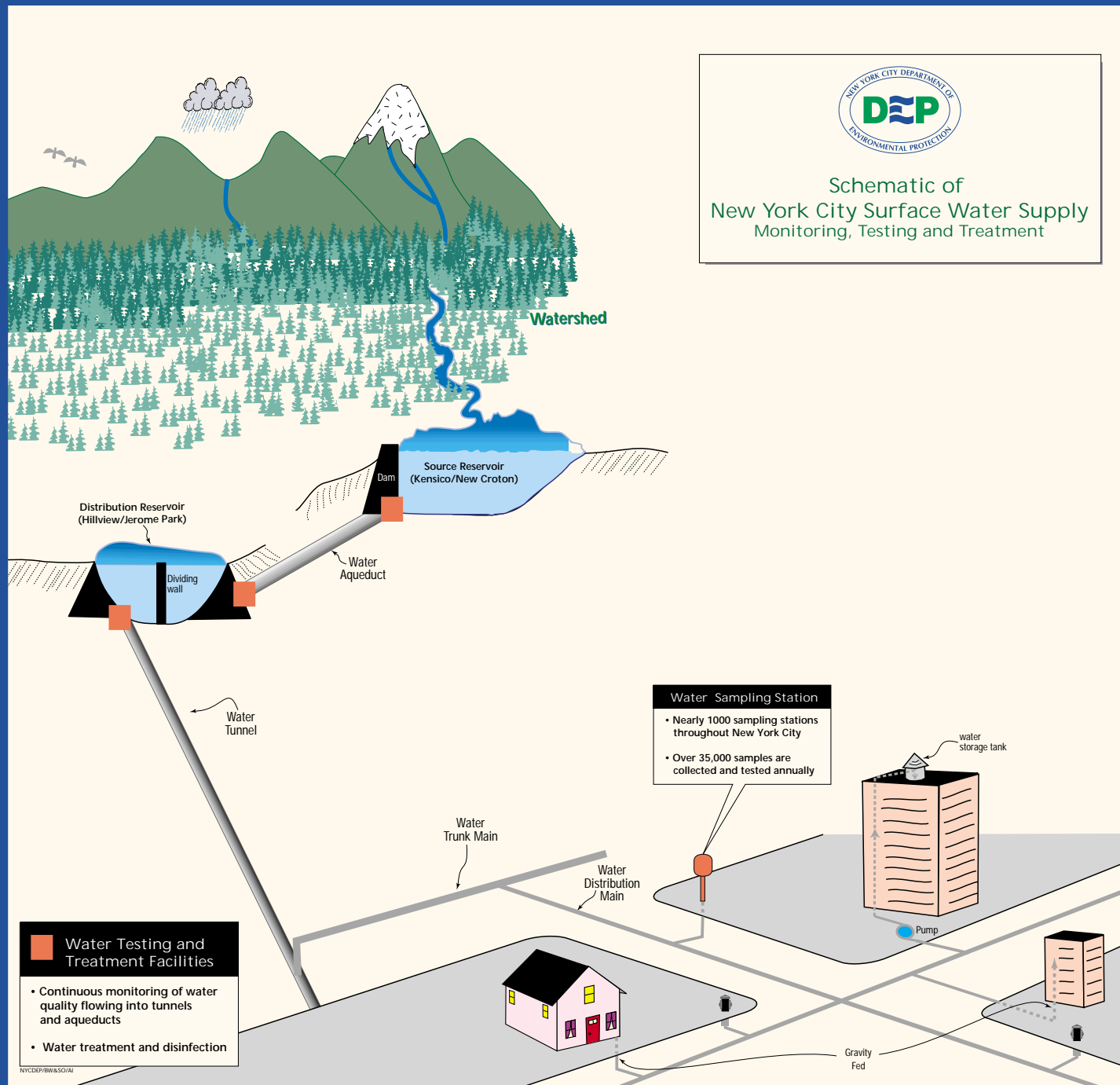
All surface water and groundwater entering New York City's distribution system is treated with chlorine, fluoride, orthophosphate, and, in some cases, sodium hydroxide. New York City uses chlorine to meet the New York State Sanitary Code and federal Safe Drinking Water Act disinfection requirements. Fluoride, at a concentration of one part per million, is added to help prevent tooth decay and has been added since the mid-1960's in accordance with the New York

City Health Code. Orthophosphate is added to create a protective film on pipes which reduces the release of metals such as lead from household plumbing. Sodium hydroxide is added to Catskill/Delaware water to raise the pH and reduce corrosivity.

A sequestering phosphate is applied at several wells to prevent the precipitation of naturally occurring minerals, mostly iron and manganese, in the distribution mains and customers' household piping. Air stripper facilities operate at several wells to remove volatile organic chemicals.



Schematic of
New York City Surface Water Supply
Monitoring, Testing and Treatment



Ensuring a Safe and Sufficient Supply of Water

Watershed Programs

During 1999, New York City continued implementation of the watershed protection and partnership programs set forth in the January 1997 Watershed Memorandum of Agreement (MOA). These efforts focused on three key programs: the acquisition of watershed lands; the enforcement of strengthened Watershed Regulations; and the expansion of partnership programs that target specific sources of pollution in the watershed. In addition, DEP continued work on a number of water quality studies, and continued implementing the upgrades of City-owned and non-City-owned wastewater treatment plants (WWTPs).



Watershed Agricultural Program

Land Acquisition

In 1999, DEP met the goals for procuring watershed lands set forth in the 1997 Filtration Avoidance Determination (FAD) and the MOA. Specifically, DEP solicited 42,733 acres of watershed lands in designated priority areas. As of December 1999, DEP had 18,669 acres in 287 parcels either acquired or under purchase contract for a cost of \$55.8 million. DEP also began an initiative to purchase conservation easements from willing sellers and a Whole Farm Easement Program in partnership with the Watershed Agricultural Council.

Watershed Regulations

On May 1, 1997, enhanced Watershed Regulations became effective, replacing regulations that had been in place since 1953. The Regulations are vital to water supply protection and provide a higher level of defense against modern-day threats to water quality. By vigorously enforcing the new Regulations, DEP is ensuring that the City's source waters are protected. The steps taken to ensure a high quality water supply include: aggressive policing and inspection of the watersheds, greatly increased water quality monitoring,

systematic inspections of wastewater treatment plants, investigations of other potentially-polluting activities, and legal actions against polluters. Furthermore, in 1999, DEP staff reviewed more than 1,330 applications for new or remediated septic systems, 50 stormwater pollution prevention plans, and more than 90 proposals for projects that included one or more regulated activities.

Partnership Programs

In 1999, New York City made nearly \$30 million in payments to support a variety of partnership programs in accordance with the terms of the MOA. West of the Hudson River, many of the partnership programs are being administered by the Catskill Watershed Corporation (CWC), a non-profit corporation formed solely for that purpose. Together, CWC and DEP continued to implement programs that remediated 374 failing septic systems, completed construction of 17 winter road de-icing materials storage facilities, processed funding applications for new stormwater control facilities for 11 projects, and solicited proposals for construction of best management practices to address existing stormwater runoff. In addition, CWC completed a study for the use of the City-funded \$60 million Catskill Fund for the Future, which seeks to assist economic development opportunities in the watershed consistent with the City's water quality objectives.



Watershed Agricultural Program

Wastewater Treatment Plant Upgrades

The City continues to advance the program to upgrade all of the 102 non-City-owned wastewater treatment plants (WWTP) in the watershed. All facilities have signed agreements to participate in the upgrade program and have begun the process of hiring engineers to complete upgrade designs. In addition, the City completed the multi-million dollar upgrade of the Margaretville WWTP in Delaware County, the seventh of the City's eight watershed wastewater treatment facilities to be completely redesigned and upgraded.

Upstate Capital Improvements

The City continued to implement a multi-year program to upgrade and improve its upstate water supply facilities, including gatehouses, aqueducts, water testing laboratories, and other facilities which are important to ensuring a safe and reliable supply of drinking water. An ongoing dam reconstruction program has also been in effect for rehabilitation of dams. In 1999, work was done on facilities at the Amawalk, Titicus, Cross River, and West Branch Reservoirs, and at Kirk Lake, Lake Gilead, and Lake Gleneida.

The Distribution System



Sampling Stations

Since May 1, 1999, 28 fixed sampling sites (26 compliance and 2 surveillance) have been in use in the Groundwater System. The new stations replace internal compliance sampling sites, marking the completion of a project to install nearly 1000 fixed sampling stations throughout the entire City. These stations, which you may have seen in your neighborhood, allow DEP to collect water samples throughout the distribution system in an efficient and sanitary manner.

Water Quality Tracking System

DEP has put in place a new state of the art computer program and water quality tracking system. This system, called the Distribution Water Quality Module (DWQM), allows Drinking Water Quality Control staff to quickly access a large number of water quality parameters, including, chlorine residual, orthophosphate concentration, color, turbidity, bacteria, Heterotrophic Plate Count, and disinfection by-products, throughout the City as a whole or any section of the City. The system's ability to almost instantaneously identify problem locations or areas with low chlorine or high color, and track water quality trends, makes it an effective water quality management tool and helps to provide the best possible water quality throughout the City.

City Water Tunnel No. 3

The Third Water Tunnel, begun in 1970, is being built in three stages. The first stage of Tunnel No. 3, which became operational in July 1998, has already helped to improve the reliability of the City's drinking water distribution system. Stage II of Tunnel No. 3 includes two segments, and is scheduled to be finished in 2008.

The first segment of Stage II which is in Brooklyn and Queens, is currently under construction and upon completion will improve service to Staten Island, Brooklyn and Queens. This phase will be followed by the construction of the Manhattan segment of Stage II.

Eventually, Stage III will extend from the Kensico Reservoir in Westchester County to the Van Cortlandt Park Valve Chamber in the Bronx, and Stage IV will deliver water to the eastern parts of the Bronx and Queens. When finished in 2020, Tunnel No. 3 will create a more flexible means of supplying drinking water to the entire City and will provide delivery alternatives in the event of disruption in any of the older tunnels. It will also permit New York City to drain, examine and rehabilitate City Tunnels No. 1 and 2.





www.ci.nyc.ny.us/dep

NEW YORK CITY WATER TUNNELS & WATER DISTRIBUTION AREAS



This map of the City indicates the general areas where water can be supplied by the Croton and Groundwater Systems when they are on line. It is possible to supply the entire City from the Catskill/Delaware System.

Operations

In our ongoing efforts to maintain the appropriate volume and high quality of water in the distribution system, there is some rotation in the water sources used by DEP. In the Groundwater System, wells are routinely removed and returned to service for maintenance or due to changes in demand. The entire Croton System was shut down from September 17, 1999, through the end of the year due to elevated levels of color, (which is an aesthetic problem, not a public health concern), and to permit contract work in the Croton Aqueduct. The Groundwater wells were then shut down in succession, in November and December of 1999, during an exercise in Y2K preparedness. Subsequently, for a few days, on December 29 & 30, 1999, the entire City was supplied by the Catskill/Delaware system.

Croton Filtration Plant

The City is planning to build a treatment facility to filter water from the Croton system. A preferred location for the filtration plant, the Mosholu Driving Range of Van Cortlandt Park in the Bronx, was announced in December 1998 and a design for the proposed facility is being prepared. The Croton filtration plant is slated to be operational by 2007.

The federal Surface Water Treatment Rule (SWTR) requires that all water supplies be filtered by June 29, 1993, unless the system meets special criteria to receive a waiver. Even though Croton water quality is high, it experiences seasonal color problems and will be subjected to stricter standards for disinfection by-products in the near future. In 1992, the City entered into a Stipulation with the New York State Department of Health calling for the construction of a Croton filtration facility.

In May 1998, the City entered into a Consent Decree with the United States and the State of New York, thereby settling an enforcement action brought against the City because it is not filtering Croton water at this time. In November 1998, the U.S. District Court for the Eastern District of New York approved the Consent Decree. The Consent Decree supercedes the 1992 Stipulation and sets out a revised timetable for the design and construction of the Croton filtration facility.

Until DEP begins to filter Croton water we are required to make the following statement: *Inadequately treated water may contain disease-causing organisms. These organisms include bacteria, viruses, and parasites, which can cause symptoms such as nausea, cramps, diarrhea, and associated headaches.*

DEFINITION OF TERMS

Action Level (AL):

The concentration of a contaminant, which if exceeded, triggers treatment or other requirements which a water system must follow. An exceedence occurs if more than 10% of the samples exceed the Action Level.

Maximum Contaminant Level (MCL):

The highest level of a contaminant that is allowed in drinking water. MCLs are set as close to the MCLGs as feasible using the best available treatment technology.

Maximum Contaminant Level Goal (MCLG):

The level of a contaminant in drinking water below which there is not known or expected risk to health. MCLGs allow for a margin of safety.

Treatment Technique (TT):

A required process intended to reduce the level of a contaminant in drinking water

90th Percentile Value:

The values reported for lead and copper represent the 90th percentile. A percentile is a value on a scale of 100 that indicates the percent of a distribution that is equal to or below the value. The 90th percentile is equal to or greater than 90% of the lead and copper values detected at your water system.

ABBREVIATIONS

NA = Not Applicable

ND = Non Detect

NDL = No Designated Limit

CFU/ml = colony forming units per milliliter

mg/L = milligrams per liter (10⁻³ grams per liter)

µg/L = micrograms per liter (10⁻⁶ grams per liter)

pCi/L = picocurie per liter (a measure of radioactivity)

NTU = Nephelometric Turbidity Units

µmho/cm = micromhos per centimeter