New York City's Battles for Imported Water

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I. DESCRIPTION OF NEW YORK CITY'S WATER SUPPLY SYSTEM.

New York City uses more than 1.2 billion gallons of water per day, which is supplied by a series of reservoirs located north and west of the City in the Catskill Mountains. There are three separate watershed areas in the water supply system:

1. The Croton watershed, located immediately north of the City in Westchester and Putnam Counties is the oldest, having been initiated in the late 19th century, and completed by 1920. It provides 200 million gallons of water per day from a complex system of controlled lakes and reservoirs.

2. The Catskill watershed is situated in the northern Catskills, about 100 miles upstate, near Kingston, N. Y. It consists of two huge reservoirs, which were constructed in the 1920's, and supplies about 450 million gallons of water to the City each day.

3. The Delaware Watershed lies in an area to the Northwest of the City, in the

western part of the Catskills. There are three major reservoirs in this system, and it supplies almost 700 million gallons per day to the City - approximately 40% of the supply.

II. LEGAL PROBLEMS INVOLVED WITH THE DEVELOPMENT OF THE CROTON AND CATSKILL WATERSHED RESERVOIRS.

1. Neither system involves an interstate waterway, so our legal problems lay entirely within the State of New York.

(a) The City needed State legislation to allow it to condemn property outside of its boundaries for water supply purposes. The basic legislation giving us this right, the Water Supply Act of 1905 requires us to provide water to several upstate communities and to treat sewage in some of them.

(b) The condemnation proceedings we initiated to take title to the 96,000 acres of land we needed for our reservoirs were hotly contested. In fact a residue of bitterness on the part of the upstate citizenry, many of whom lost family homesteads, remains to this day.

(c) Riparian owners brought claims against the City for damages suffered when we obstructed the flow of several rivers and streams. Thousands of these claims have yet to be settled, so the City maintains an office staffed with two attorneys in Kingston, New York, working on riparian claims almost exclusively.

III. LEGAL PROBLEMS INVOLVED WITH THE DEVELOPMENT OF THE DELAWARE WATERSHED.

1. These reservoirs capture water which would otherwise flow into the Delaware River, an interstate waterway rising in New York and flowing through New Jersey, Pennsylvania and Delaware. The Delaware River provides a primary source of water to New Jersey and Pennsylvania and is essential to the economy of Delaware , so a tremendous amount of interstate controversy arose when we initiated our plans to divert its waters.

2. The first round came in 1929, when the City began the initial phase of its Delaware program - construction of the Pepacton and Neversink Reservoirs.

(a) New Jersey brought suit against New York State and the City in the U.S.

Supreme Court. Pennsylvania and Delaware intervened. Three basic issues were litigated.

1. Was New York City, a municipality situated outside of the Delaware River Basin, entitled to divert water for its use?

2. If it was, what principles should be applied to determine what amount it is entitled to take?

3. Applying such principles, what quantity of water could the City divert from the River?

(b) The Court appointed a Special Master, who submitted his report two years later, finding:

1. The City was entitled to take water from the River. Utilization of the portion of the Delaware River lying within its borders, the Special Master found, is a matter left to the discretion of the State of New York. If it opts to allow the City to divert water for water supply purposes, (which the Master felt was the highest use to which a river can be put) it can do so. Even though the City lies within the basin of the Hudson River, a major waterway

which could be used to supply its water, it may, with the permission of the State, select to import the higher quality water of the Delaware River.

2. However, this right must be limited by the application of certain principles. The Special Master found that neither the doctrine of Riparian Rights nor that of Prior Appropriation could properly be applied, so he developed the Doctrine of Equitable Apportionment, suggesting that the waters of the Delaware be distributed among the States according to the principles of equity.

3. Applying such principles, he recommended that the City be allowed to divert 440 million gallons per day. The City had requested 600 m.g.d.

The Court approved the Special Master's report in one of Justice Holmes' most notable opinions. N.J. v. N.Y. 283 U.S. 336 (1931).

3. The second round came in the early 1950's, when the City sought to construct the Cannonsville Reservoir. The City made an application to amend the 1931 decree, to allow it to divert up to 800 m.g.d.

Again a Special Master was appointed; testimony was taken and negotiations were convened over a period which lasted for two years. The parties were able to negotiate a consent decree which was adopted by the Court in 1954. N.J. v. N.Y. 347 U.S. 995 (1954).

(a) The heart of the amended decree was the so called "Montague formula". Simply stated, this formula allowed the City to divert up to 800 M.G.D. from all of its Delaware Reservoirs, provided that it made sufficient releases back to the River to maintain a streamflow at Montague, New Jersey of at least 1750 cubic feet per second at all times.

1. This scheme was designed to allow the City to divert enough water to meet its needs while maintaining a large enough streamflow to continuously repel the "salt front" which would otherwise creep upstream from Delaware Bay, threatening water supplies in New Jersey and Pennsylvania.

2. It was founded upon various technical assumptions including the "drought of record", the one which took place in the

Northeast in the 1930's. It was anticipated that no more severe a drought would be experienced.

(b) A River Master was appointed to oversee the City's compliance with the Montague formula, and to undertake other activities to "conserve the waters of the basin".

4. The third round came after 1961, when the Delaware River Basin Compact was signed, bringing the Delaware River Basin Commission into existence.

(a) This compact, which is cited as Pub. L. 87-328 [75 Stat. 688], contains several important provisions including:

1. Section 3.3, which provides DRBC with extraordinary powers to be used in the event of a water supply emergency: including the power to alter the diversions and releases of the decree with the unanimous consent of the Commission members (the City of New York, a party to the decree is not a "member" of the Commission - it must rely upon the State of N.Y. to represent its interests in a water supply emergency.)

2. Section 3.5 prohibits the DRBC from altering the diversions and releases of the City reservoirs without the unanimous consent of the parties to the 1954 decree, except during an emergency.

3. Section 3.4, whereby all of the signatory parties (including New York State, New Jersey, Pennsylvania and Delaware) absolutely waived their rights to seek an amendment to the 1954 decree for a period of 100 years.

(b) In the mid-60's a drought much more severe than the "drought of record", the one experienced in the 1930's, occurred. Compliance with Montague formula, based as it was on a less severe drought, led to the near depletion of the reservoirs, and to the declaration of a water supply emergency by DRBC.

1. The Commission declared this emergency only after the City abruptly ceased making releases at the direction of the River Master and streamflow fell sharply.

2. The administrative proceedings which ensued, therefore took place in

an atmosphere of crisis and interstate acrimony. However, emergency orders were issued cutting back diversions and releases, and imposing conservation requirements, so the emergency was abated.

5. The fifth round of controversy took place in the 1970's. Pennsylvania and New Jersey had intended to cope with the water supply problems made apparent by the drought of the 1960's by constructing a large reservoir on the mainstream of the Delaware. However, this reservoir (known as "Tock's Island") was to be situated near the scenic Delaware Water Gap, and an environmental and political controversy flared. The project was abandoned in 1977 when Congress (with the support of the Governor of New York State) declared the area to be a wild and scenic preserve.

(a) Pennsylvania, in reaction, introduced a resolution in the DRBC in 1978 which called for the parties to the decree to renegotiate the Montague formula, and threatened to seek to reopen the decree (despite the waiver contained in the compact)

if such negotiations were unsuccessful.

1. The City objected, but recognizing that the drought of the 1960's undercut the Montague formula, the parties negotiated a resolution which called for "good faith" discussions to develop a long-term drought contingency plan which would reduce the diversions and releases of the decree in the event of a severe shortage.

2. The "good faith" negotiations took place from 1979-1980, but were suspended when a severe drought hit the northeast in the fall of 1980. The "good faith" negotiators turned their attention to dealing with the drought of the 1980's.

(b) This drought was nearly as severe as the drought of the 1960's, but the negotiations were not so acrimonious.

1. A technical consensus had already been negotiated fixing the point at which a drought "warning" and a drought "emergency" would be declared by the Commission. This point was based upon the water level in the New York City Delaware Basin reservoirs.

2. The parties had already gone some way towards developing a phased

diversion/release cutback scheme, keyed to the depth of the drought.

3. A consensus had already been reached as to the basic elements of a common conservation plan.

(c) DRBC emergency orders, containing specific diversion and release cutbacks were negotiated and implemented in three stages during the drought. The final stage, which became effective during the most severe part of the drought reduced the City's diversion to 520 m.g.d. and reduced the releases required to maintain streamflow at Montague at levels varying from 1550 to 1100 c.f.s. depending upon the geographical location of the salt front.

(d) It rained in February, 1981 and ample rain has continued since that time so the reservoirs are now full, and the "good faith" discussions have been resumed. A proposed agreement is nearing completion, and will shortly be undergoing public review.

It contains recommendations for control of the advancing salt front, for regulation of consumptive and depletive uses, as well as emergency measures to be taken during future times.

GEODATA/NEW YORK'S WATER SUPPLY

Archaeologists sifting through the bleached bones of our civilization may find nothing more startling than the Promethean contrivances that deliver pure mountain water to New York City.

■ The water supply was created in three stages: first the Croton system (1842–1905); then the Catskill system (1907–17); and finally the Delaware system (1928–64). Through the genius of the city's engineers, virtually all of the water arrives by gravity, with pressure sufficient to lift it to the sixth-floor level of Manhattan; from there, pumps do the rest of the work.

■ Most sections of the Catskill and Croton aqueducts are just beneath the earth's surface, but the Delaware Aqueduct is a deep rock tunnel over its entire length of 85 miles.

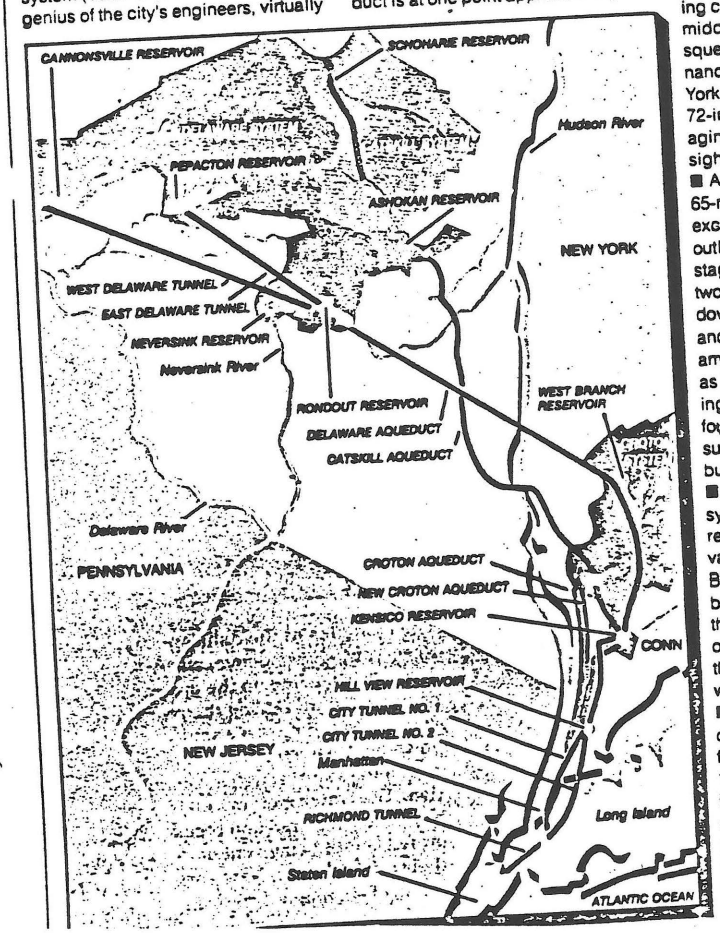
■ When passing under the Shawangunk Mountains, the Delaware Aqueduct is at one point approximately 2,500 feet beneath the surface of the earth. Its diameter is 13.5 feet, large enough to accommodate a locomotive, and at times of peak demand it carries about 2,200 cubic feet of water per second.

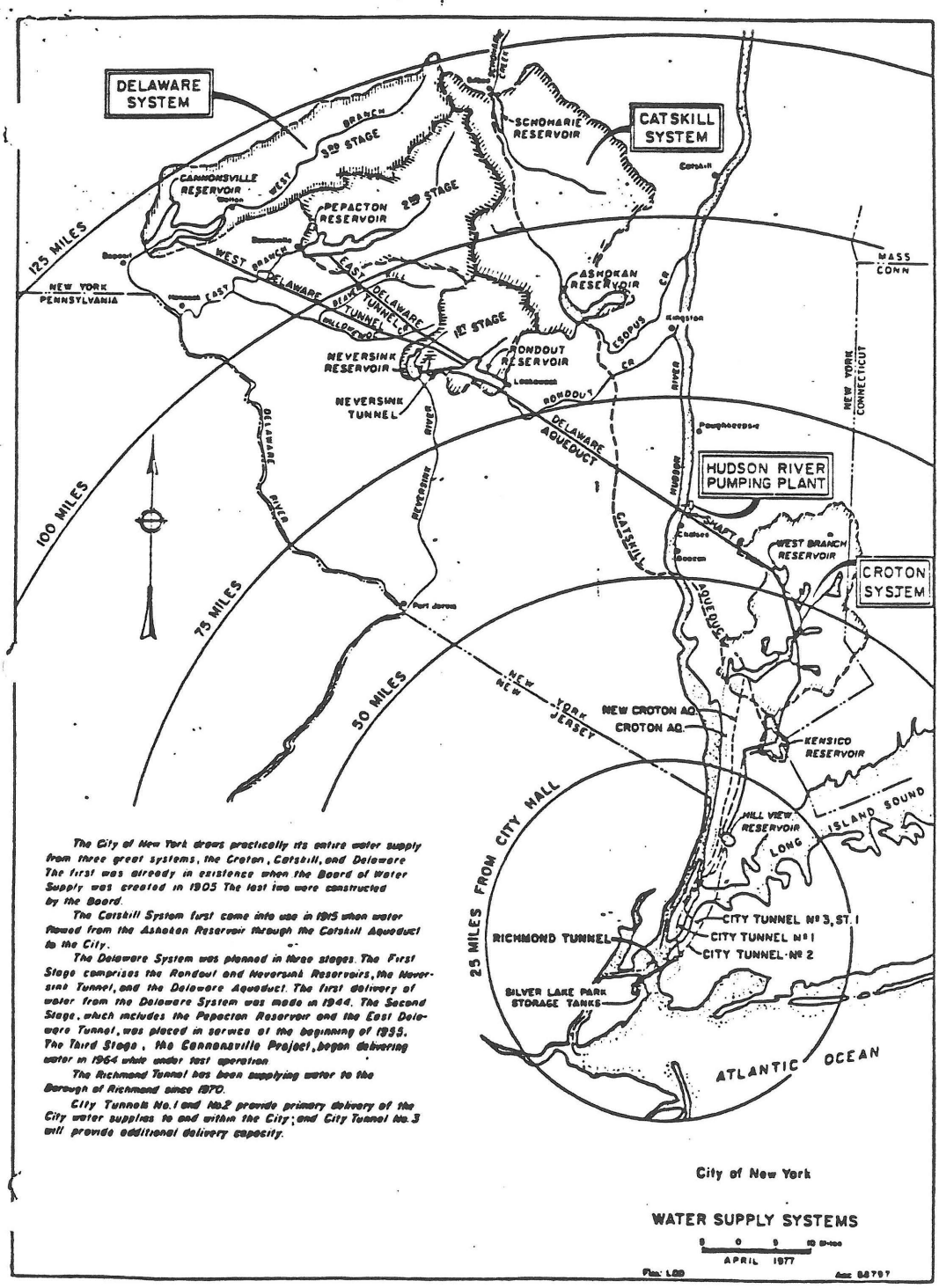
■ When the water arrives in New York City, it enters two tunnels hundreds of feet beneath the surface. The water is lifted in intermittently spaced riser shafts, which feed it into trunk mains, distribution mains and, finally, building connections. Marching down the middle of Amsterdam Avenue, squeezed between the other appurtenances of civilization that make New York City habitable, are 34 miles of 72-inch trunk mains carrying unimaginable quantities of water—out of sight and out of mind.

■ At a cost of about $5 billion, a 65-mile third city tunnel is being excavated under New York City and outlying areas. When two of its four stages are completed, the city's other two aging tunnels may finally be shut down, one at a time, for inspection and maintenance. At 24 feet, the diameter of the tunnel is about as large as the fuselage of a jumbo jet; a visiting delegation of Chinese engineers found it impossible to believe that such a conduit could be filled to bursting with water.

■ To connect and better control the system, a 600-foot-long, 60-foot-high regulation chamber has been excavated 280 feet beneath the North Bronx. Here, 96-inch, 70,000-pound butterfly valves, made in Japan to the thousandth-of-an-inch tolerance of aircraft engines, will choreograph the movement of the city's entire water supply.

■ The city's per capita consumption of water has increased steadily—from 135 gallons a day in 1965, to 178 gallons in 1975, to 190 gallons in 1979. The spread of central air conditioning is one factor in the rise, along with increased use of home appliances and the thousands of undiscovered leaks in abandoned buildings throughout the city.





The City of New York draws practically its entire water supply from three great systems, the Croton, Catskill, and Delaware. The first was already in existence when the Board of Water Supply was created in 1905. The last two were constructed by the Board.

The Catskill System first came into use in 1915 when water flowed from the Ashokan Reservoir through the Catskill Aqueduct to the City.

The Delaware System was planned in three stages. The First Stage comprises the Rondout and Neversink Reservoirs, the Neversink Tunnel, and the Delaware Aqueduct. The first delivery of water from the Delaware System was made in 1944. The Second Stage, which includes the Pepacton Reservoir and the East Delaware Tunnel, was placed in service at the beginning of 1955. The Third Stage, the Cannonsville Project, began delivering water in 1964 while under test operation.

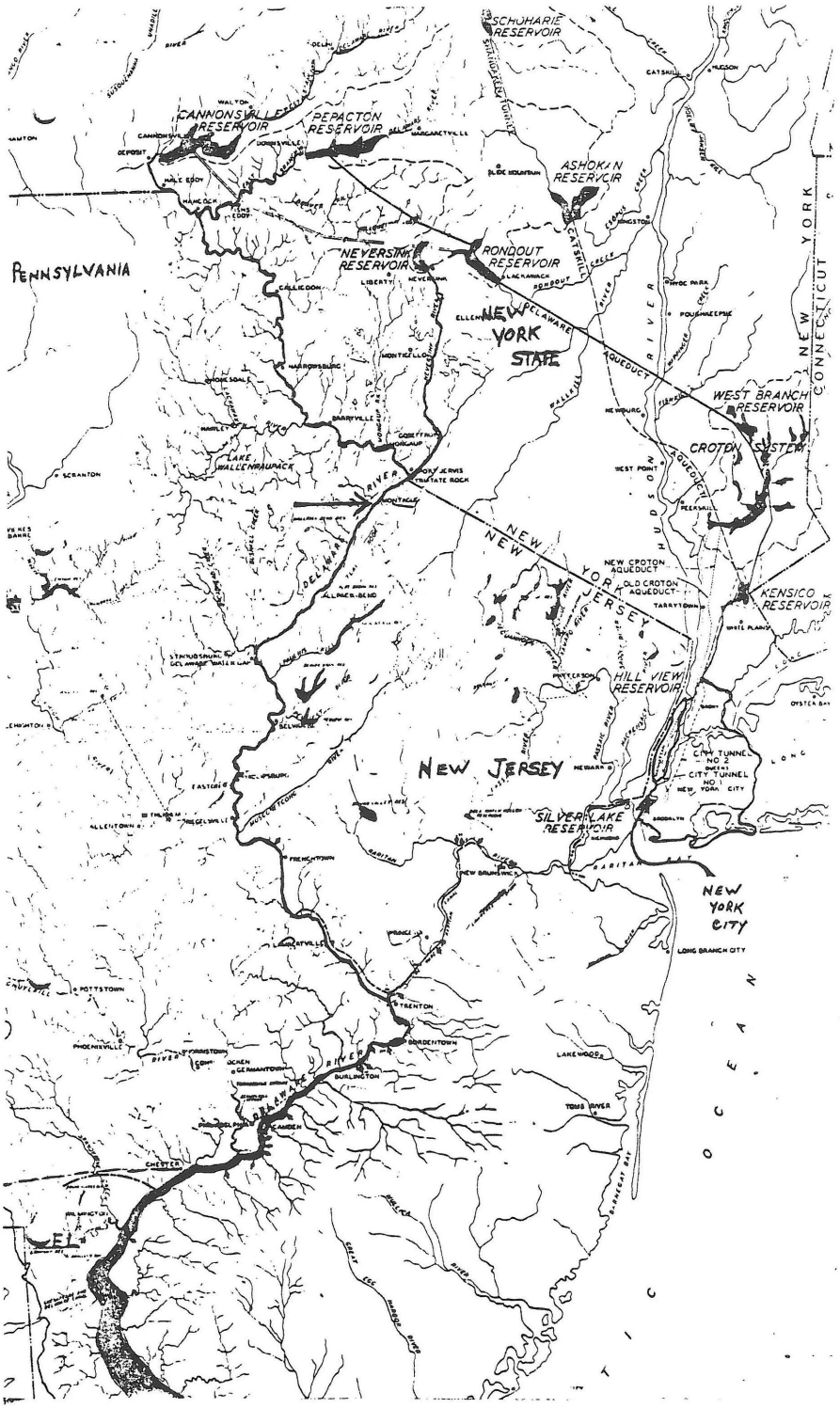
The Richmond Tunnel has been supplying water to the Borough of Richmond since 1970.

City Tunnels No. 1 and No. 2 provide primary delivery of the City water supplies to and within the City; and City Tunnel No. 3 will provide additional delivery capacity.

City of New York

WATER SUPPLY SYSTEMS

APRIL 1977


SCHOHARIE RESERVOIR
CANNONSVILLE RESERVOIR
PEPACTON RESERVOIR
ASHOKAN RESERVOIR
NEVERSINK RESERVOIR
RONDOUT RESERVOIR
PENNSYLVANIA
NEW YORK STATE
DELAWARE AQUEDUCT
WEST BRANCH RESERVOIR
CROTON SYSTEM
CROTON AQUEDUCT
NEW CROTON AQUEDUCT
OLD CROTON AQUEDUCT
KENSICO RESERVOIR
HILL VIEW RESERVOIR
LAKE WALLENPAUPACK
DELAWARE RIVER
HUDSON RIVER
NEW YORK
NEW JERSEY
CONNECTICUT
NEW JERSEY
SILVER LAKE RESERVOIR
CITY TUNNEL NO 2
CITY TUNNEL NO 1
NEW YORK CITY
LONG BRANCH CITY
TRENTON
CAMDEN
BURLINGTON
BRADENTOWN
POTTSTOWN
ALLENTOWN
EASTON
NEWARK
LAKEWOOD
TOMS RIVER
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OCEAN