

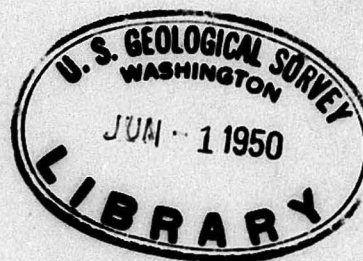
*Luszczynski, Norbert Joseph, 1915-*

UNITED STATES  
DEPARTMENT OF THE INTERIOR  
GEOLOGICAL SURVEY

Withdrawal of Ground Water and Pond Water on  
Long Island from 1904 to 1949

by

*Norbert Joseph*  
N. J. Luszczynski 1915-



Prepared in cooperation with the  
New York Water Power and Control Commission  
Nassau County Department of Public Works  
Suffolk County Board of Supervisors  
Suffolk County Water Authority

Mineola, New York

February 1950

50-83

## Withdrawal of Ground Water and Pond Water on Long Island from 1904 to 1948

For more than 50 years the highly productive and readily replenishable water-bearing sands and gravels on Long Island - capable of yielding an average of at least 1,000 million gallons a day - and also some surface streams and ponds have been utilized on a large scale for public water supply and industrial, agricultural and domestic uses. During the drought months of 1949, when many surface and ground-water supplies were being depleted at an alarming rate in many localities in the Northeast, the abundant water resources of Long Island provided sufficient water for public water supply for a large number of private companies and municipalities, as well as for large emergency drafts by the City of New York. In addition they kept industrial concerns from curtailing production, saved millions of dollars of potato, cauliflower, and other Long Island crops, and even furnished, during the summer heat, comfort cooling to theatersgoers.

Withdrawals for all purposes have varied considerably throughout the years since 1904, having been as low as 100 million gallons a day in 1918 and as high as 230 million gallons a day in 1915 and 250 million gallons a day in 1931. Preliminary estimates indicate that the average pumpage in 1949 was about 270 million gallons a day and exceeded previous peaks by about 20 million gallons a day. Withdrawals in 1949 for public water supply alone are estimated to have been about 175 million gallons a day. However, this rate was exceeded several times during the period 1908-16, when, in 1916, the record of 189 million gallons a day for public supply was set.

As might be expected, the greatest single draft for public water supply on Long Island has been made by the City of New York - from 1904 to 1948 from its ground water and ponds in southern Nassau and Queens Counties, and until 1943 from ground-water installations in Kings County (see figure 1). During the 45-year period 1904-48, the City of New York pumped an average of 72 million gallons a day from installations in the three western counties on Long Island for distribution to the boroughs of Brooklyn and Queens (Kings and Queens Counties). This immense volume of water, equivalent to a depth of more than 4 feet over the entire land area of Long Island, would suffice now for barely 3 years at the present rate of consumption by the more than 8,000,000 inhabitants of New York City.

Between 1904 and 1916 when the water furnished to residents of Brooklyn and Queens was solely of Long Island origin, the City of New York removed an average of more than 137 million gallons a day from its Long Island developments. Of this amount, 36 percent was taken from ponds, the remainder being pumped from wells. Since World War I, when surface water from the Catskill Mountains was first piped beneath the East River into Brooklyn and Queens, the City of New York has reduced quite appreciably its withdrawals from Long Island, the average for the period 1917-48 being only 46 million gallons a day.

During the entire 45 year period 1904-48, the City of New York alone pumped within 1 percent as much water from Long Island as all other public water-supply systems on Long Island, and exceeded by about 10 percent the combined draft of all such systems in Kings, Queens, and Nassau Counties (see figure 1).



The highly permeable outwash deposits in southern Nassau County have been the source for about 67 percent of all water obtained from Long Island by the City of New York. The City's developments in this county include two large infiltration galleries, 10 multiple-well stations and 7 ponds. The water exported from Nassau County ranged from 77 to 94 million gallons a day between 1904 and 1916 and averaged 86 million gallons a day for this period. Of this amount, 55 percent was taken from ponds. From 1917 to 1948, rates of pumpage varied considerably. No water was taken by the City from Nassau County or elsewhere on Long Island in 1918, and only insignificant amounts were taken in the two following years; but the withdrawals were as high as 62 million gallons a day in 1931 and 60 million gallons a day in 1942, when the Upstate surface supplies were depleted by drought. The average draft for the period 1917 to 1948 was 33 million gallons a day.

As the storage in the Croton, Ashokan, and Schoharie reservoir systems was being reduced rapidly during the last 6 months of 1949, the City of New York increased its withdrawals on Long Island from 64 million gallons a day in June to 97 million gallons a day in December, and averaged 82 million gallons a day for the period. Of this amount, about 60 million gallons a day were exported from Nassau County. During the entire year, an average of about 40 of the 64 million gallons a day pumped by the City of New York from Long Island was exported from Nassau County.

Public water supplies in Nassau and Suffolk Counties are furnished by numerous small private water companies, water districts, and municipalities that operate within authorized franchise areas. Since the introduction of Upstate surface water to residents of Brooklyn and Queens, the operations of all but two of the many private concerns that previously served parts of these areas have been discontinued. The last private company to cease operations was the New York Water Service Corp., which shut down its entire pumping plant in Brooklyn in June 1947. At present, only the southern half of Queens is still supplied by privately owned wells.

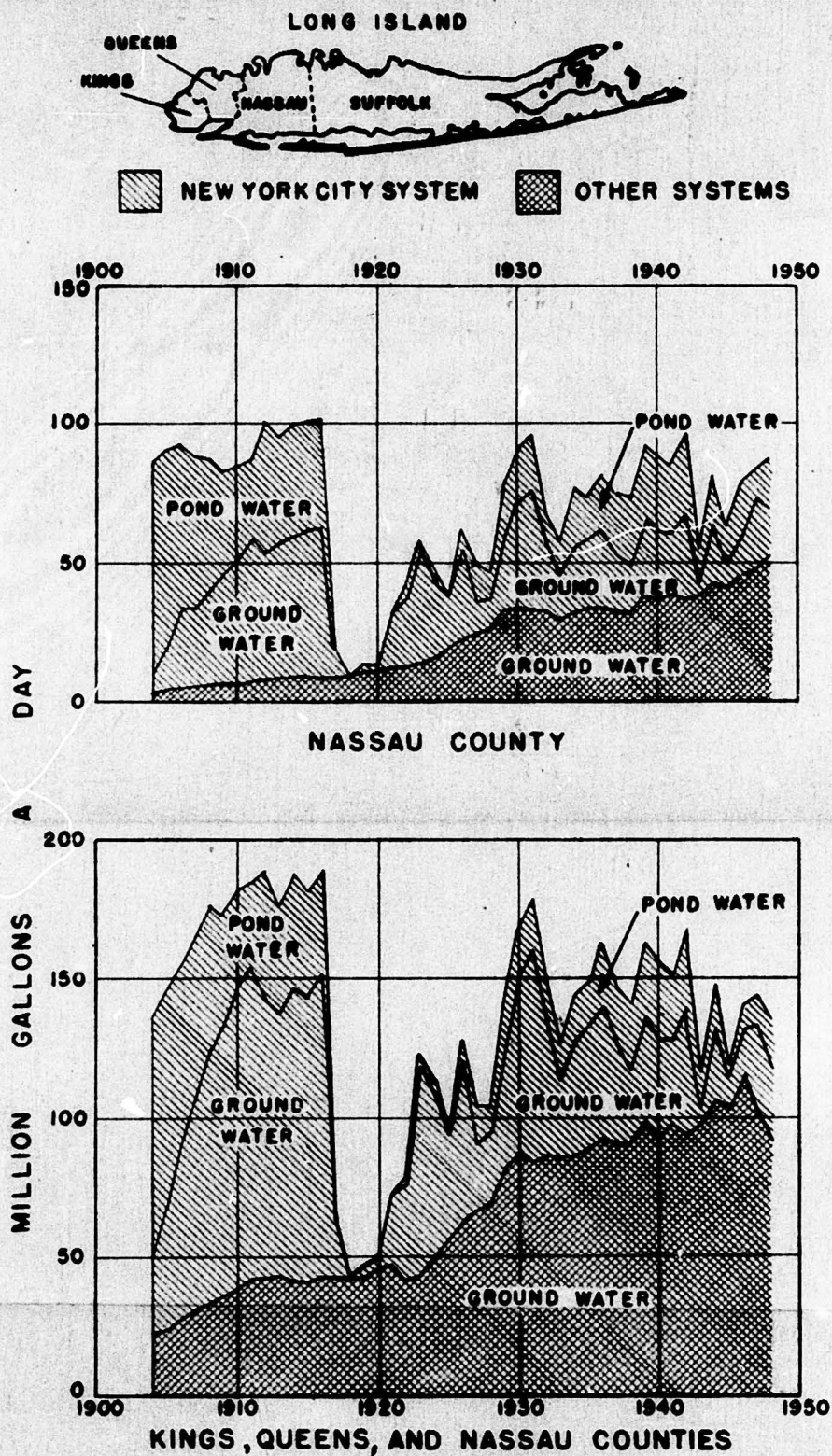
Average withdrawals for public water supply in Kings, Queens, and Nassau Counties by systems other than that of the City of New York have increased from 22 million gallons a day in 1904 to more than 100 million gallons a day during recent years, as indicated in figure 1. In Suffolk County withdrawals for public water supply totaled only about 10,000 gallons per day in 1904, but according to a recent compilation more than 18 million gallons a day were pumped in 1948.

In Nassau County, where the population has increased from 70,000 to more than 600,000 in the last 45 years, pumpage for public water supply strictly for local consumption ranged from 4 million gallons a day in 1904 to more than 52 million gallons a day in 1948. Withdrawals in Nassau County by the City of New York and local systems averaged 71 million gallons a day for 1904-48 and were as high as 101 million gallons a day in 1912 and 1916 and 96 million gallons a day in 1931 and 1942. Indications are that public water-supply pumpage in Nassau County in 1949 probably surpassed the record high pumpage of 101 million gallons a day by at least 2 or 3 million gallons a day, more than 60 million gallons a day being consumed within Nassau County.

It appears quite likely that pumpage for public water supply on Long Island in 1950 will exceed that in 1949, as the City of New York probably will have to continue heavy emergency withdrawals throughout the year. In addition, many new wells for public water supply, industrial use, and supplemental irrigation are being constructed

in Queens, Nassau, and Suffolk Counties and local pumpage will also be increased. However, it is believed that average withdrawals for all uses will not exceed 300 million gallons a day in 1980, a withdrawal considerably below the minimum perennial replenishment from precipitation. Continued heavy pumpage along the shore line, however, may cause local salting of some aquifers.





**FIGURE 1—GRAPHS SHOWING AVERAGE DAILY WITHDRAWAL OF WATER FOR PUBLIC SUPPLY IN NASSAU, QUEENS, AND KINGS COUNTIES, 1904 - 48**