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REPORT OF THE RIVER MASTER OF THE DELAWARE RIVER

FOR THE PERIOD DECEMBER 1, 2006–NOVEMBER 30, 2007

Open-File Report 2011–1239

U.S. Department of the Interior
U.S. Geological Survey

CALENDAR FOR REPORT YEAR 2007

DECEMBER 2006

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Report of the River Master of the Delaware River for the period December 1, 2006–November 30, 2007

By Bruce E. Krejmas, Gary N. Paulachok, and Stephen F. Blanchard

Open-File Report 2011–1239

U.S. Department of the Interior
U.S. Geological Survey

U.S. Department of the Interior
KEN SALAZAR, Secretary

U.S. Geological Survey
Marcia K. McNutt, Director

U.S. Geological Survey, Reston, Virginia: 2011

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Conversion Factors and Vertical Datum

Multiply	By	To obtain
	Length	
inch (in.)	25.4	millimeter (mm)
foot (ft)	0.3048	meter (m)
mile (mi)	1.609	kilometer (km)
	Area	
square mile (mi^2)	2.590	square kilometer (km^2)
	Volume	
million gallons (Mgal)	3,785	cubic meter (m^3)
million gallons (Mgal)	1.547	cubic foot per second day (ft^3/s)-d
billion gallons (Bgal)	3.785	cubic hectometer (hm^3)
cubic foot per second day (ft^3/s)-d	0.002447	cubic hectometer (hm^3)
	Flow rate	
million gallons per day (Mgal/d)	1.547	cubic foot per second (ft^3/s)
million gallons per day (Mgal/d)	0.04381	cubic meter per second (m^3/s)
billion gallons per day (Bgal/d)	43.81	cubic meter per second (m^3/s)
cubic foot per second (ft^3/s)	0.02832	cubic meter per second (m^3/s)

Datum: Vertical coordinate information is referenced to the North American Vertical Datum of 1988. Horizontal coordinate information is referenced to the North American Datum of 1983.

Elevation, as used in this report, refers to the distance above a vertical datum.

Temperature in degrees Celsius (°C) may be converted to degrees Fahrenheit (°F) as follows:
°F=(1.8x°C)+32

CHEMICAL CONCENTRATIONS

In this report, concentrations of chloride and dissolved oxygen are given in milligrams per liter (mg/L). Milligrams per liter represents the mass of solute (milligrams) per unit volume (liter) of water.

RIVER MASTER LETTER OF TRANSMITTAL AND SPECIAL REPORT

OFFICE OF THE DELAWARE RIVER MASTER
United States Geological Survey
415 National Center
Reston, Virginia 20192

October 14, 2011

The Honorable
John G. Roberts, Jr.
Chief Justice of the United States

The Honorable
Jack A. Markell
Governor of Delaware

The Honorable
Christopher J. Christie
Governor of New Jersey

The Honorable
Andrew M. Cuomo
Governor of New York

The Honorable
Tom Corbett
Governor of Pennsylvania

The Honorable
Michael R. Bloomberg
Mayor of the City of New York

No. 5, Original.—October Term, 1950
State of New Jersey, Complainant,
v.
State of New York and City of New York, Defendants,
Commonwealth of Pennsylvania and State of Delaware, Intervenors.

Dear Sirs:

For the record and in compliance with the provisions of the Amended Decree of the Supreme Court of the United States entered June 7, 1954, I am hereby transmitting the 54th Annual Report of the River Master of the Delaware River for the 12-month period from December 1, 2006, to November 30, 2007. In this report, this period is referred to as the River Master report year or the report year.

During the 2007 River Master report year, monthly precipitation in the upper Delaware River Basin ranged from 40 percent of the long-term average in May 2007 to 192 percent of the long-term average in October 2007. Total precipitation during the report year was 2.90 inches (in.) more than the long-term average. Precipitation during the December to May period, when reservoirs typically refill, was 0.24 in.

less than the 66-year average. Precipitation during the report year was below normal in December, May, June, August, and September and above normal in the other months.

On December 1, 2006, when the report year began, combined storage in the New York City reservoirs in the upper Delaware River Basin was 270.220 billion gallons (Bgal) or 99.8 percent of combined storage capacity. Median combined storage on December 1, computed on the basis of 39 years of record, is 177.521 Bgal. Storage remained high throughout the winter, and declined seasonally during the summer. During the report year, operations in the basin were conducted as stipulated by the Decree.

On May 30, 2007, the Delaware River Master Advisory Committee met at the U.S. Forest Service's Grey Towers Conference Center in Milford, Pennsylvania, to discuss hydrologic conditions in the basin and operational procedures for the 2007 reservoir-releases season. During the report year, the following individuals served as members of the Advisory Committee:

Delaware	John H. Talley
New Jersey	Mark N. Mauriello
New York	Mark Klotz
New York City	Paul Rush
Pennsylvania	Cathleen Curran Myers

The River Master informed the Advisory Committee that, on the basis of information provided by New York City, the excess-release quantity beginning June 15, 2007, was 7.381 Bgal. Based on reservoir release programs in Delaware River Basin Commission (DRBC) Docket No. D-77-20 CP (Revisions Nos. 7, 8, and 9), the excess release quantity was to be used for various purposes, and temporary spill reduction programs already in effect were extended.

During the report year, the River Master and staff participated in a number of water-supply related meetings of the DRBC. The Deputy Delaware River Master met periodically with representatives of the Decree Parties as a member of the Decree Parties Work Group and DRBC's Regulated Flow Advisory Committee. Issues of particular interest to the River Master involved management of reservoir releases and streamflow in the upper Delaware River Basin.

On September 27, 2007, the Decree Parties approved the implementation of a Flexible Flow Management Program (FFMP), whereby diversions and releases were managed under the Decree. The FFMP became effective on October 1, 2007.

The U.S. Geological Survey (USGS) continued operation of its field office of the Delaware River Master at Milford, Pennsylvania. Gary N. Paulachok, Deputy Delaware River Master, continued in charge of the office, assisted by Bruce E. Krejmas, Hydrologist.

During the year, the River Master's office continued the weekly distribution of a summary hydrologic report. These reports contain provisional data on precipitation in the upper Delaware River Basin, releases and spills from New York City reservoirs to the Delaware River, diversions to the New York City water-supply system, reservoir contents, daily segregation of flow of the Delaware River at the USGS Montague, New Jersey gaging station, and diversions by New Jersey. The reports were distributed to members of the Delaware River Master Advisory Committee and to other parties interested in Delaware River operations.

A monthly summary of hydrologic conditions also was provided to Advisory Committee members. The weekly and monthly hydrologic reports also were posted on the River Master's Web site.

The first section of this report documents Delaware River operations during the report year. During the year, the City of New York diverted 209.424 Bgal from the Delaware River Basin and released 221.811 Bgal from Pepacton, Cannonsville, and Neversink Reservoirs to the Delaware River. The River Master directed releases from these reservoirs to the Delaware River that totaled 55.099 Bgal.

The second section of this report describes water quality at various monitor sites on the Delaware Estuary. It includes basic data on chemical properties and physical characteristics of the water, and presents summary statistics on the data.

Throughout the year, diversions to New York City's water supply and releases designed to maintain the flow of the Delaware River at Montague were made as directed by the River Master. Diversions by New York City from its reservoirs in the Delaware River Basin did not exceed the limit stipulated by the Decree. Diversions by New Jersey also were within stipulated limits.

The River Master and staff are grateful for the continued cooperation and support of the Decree Parties. Also, the contributions of the PPL Corporation, Mirant Corporation, and Alliance Energy in informing the River Master of plans for power generation and furnishing data on reservoir releases are greatly appreciated.

Sincerely yours,

/Signed/

Stephen F. Blanchard
Delaware River Master

DELAWARE RIVER OPERATIONS

Abstract

A Decree of the Supreme Court of the United States, entered June 7, 1954, established the position of Delaware River Master within the U.S. Geological Survey (USGS). In addition, the Decree authorizes diversions of water from the Delaware River Basin and requires compensating releases from certain reservoirs, owned by New York City, to be made under the supervision and direction of the River Master. The Decree stipulates that the River Master will furnish reports to the Court, not less frequently than annually. This report is the 54th Annual Report of the River Master of the Delaware River. It covers the 2007 River Master report year—the period from December 1, 2006, to November 30, 2007.

During the report year, precipitation in the upper Delaware River Basin was 46.72 inches (in.) or 107 percent of the long-term average. Combined storage in Pepacton, Cannonsville, and Neversink Reservoirs was high on December 1, 2006. Reservoir storage remained high throughout the winter, declined seasonally during the summer, and began to recover in mid-October. Delaware River operations throughout the year were conducted as stipulated by the Decree.

Diversions from the Delaware River Basin by New York City and New Jersey were in full compliance with the Decree. Reservoir releases were made as directed by the River Master at rates designed to meet the flow objective for the Delaware River at Montague, New Jersey, on 123 days during the report year. Releases were made at conservation rates—or rates designed to relieve thermal stress and protect the fishery and aquatic habitat in the tailwaters of the reservoirs—on all other days.

During the report year, New York City and New Jersey complied fully with the terms of the Decree, and directives and requests of the River Master.

As part of a long-term program, the quality of water in the Delaware Estuary between Trenton, New Jersey, and Reedy Island Jetty, Delaware, was monitored at various locations. Data on water temperature, specific conductance, dissolved oxygen, and pH were collected continuously by electronic instruments at four sites. In addition, selected water-quality data were collected at 19 sites on a twice-monthly basis and at 3 sites on a monthly basis.

Introduction

An Amended Decree of the Supreme Court of the United States, entered June 7, 1954, authorized diversions of water from the Delaware River Basin and provided for releases of water from three New York City reservoirs—Pepacton, Cannonsville, and Neversink—to the upper Delaware River. The Decree stipulated that these diversions and releases are to be made under the supervision and direction of the Delaware River Master. The Decree also stipulated that reports on Delaware River operations be made to the Court not less frequently than annually. This report documents operations from December 1, 2006, to November 30, 2007, or the 2007 River Master report year. The report also presents information on the quality of water in the Delaware Estuary during the report year.

Some hydrologic data presented in this report are records of streamflow and water quality for USGS data-collection stations. These records were collected, computed, and furnished by the offices of the

USGS at Troy, New York; Exton and New Cumberland, Pennsylvania; and West Trenton, New Jersey, in cooperation with the States of New York and New Jersey, the Commonwealth of Pennsylvania, and the City of New York. The locations of major streams and reservoirs, and selected streamflow-gaging stations in the Delaware River Basin are shown in figure 1.

Acknowledgments

The River Master's daily operation records were prepared from hydrologic data collected chiefly on a day-to-day basis. Data for these records were collected and computed by the Office of the Delaware River Master or were furnished by the following agencies and utilities: Data for Pepacton, Cannonsville, and Neversink Reservoirs by the New York City Department of Environmental Protection, Bureau of Water Supply; for Lake Wallenpaupack by the PPL Corporation; and for Rio Reservoir by the Mirant Corporation and Alliance Energy. Precipitation data and quantitative precipitation forecasts were provided by the National Weather Service (NWS) office in Binghamton, New York.

Definition of Terms and Procedures

The following definitions apply to various terms and procedures used in the operations documented in this report. A table for converting inch-pound units to the International System of Units (SI) is given on page vi.

- **Balancing Adjustment**.—An operating procedure used by the River Master to correct for inaccuracies inherent in the design of releases from New York City reservoirs to meet the Montague flow objective. The balancing adjustment is computed as 10 percent of the difference between the cumulative adjusted directed release and the cumulative directed release required for exact forecasting. The balancing adjustment is applied to the following day's release design. The maximum daily balancing adjustment is intentionally limited to preclude unacceptably large variations in the adjusted flow objective.

- **Capacity**.—Total usable volume in a reservoir between the point of maximum depletion and the elevation of the lowest crest of the spillway.

- **Conservation releases**.—Controlled releases from Pepacton, Cannonsville, and Neversink Reservoirs designed to maintain specified minimum flows in stream channels immediately below the reservoirs (tailwaters). The conservation rates shown in table 2[1] are defined as follows:

  Normal.—Conservation releases when New York City combined reservoir storage is in the normal operations zone.

  Watch.—Conservation releases when New York City combined reservoir storage is in the drought watch operations zone.

  Warning.—Conservation releases when New York City combined reservoir storage is in the drought warning operations zone.

  Drought.—Conservation releases the when New York City combined reservoir storage is in the drought operations zone.

  The combined reservoir storage zones for the New York City Delaware Basin Reservoirs are shown in figure 2.

[1]All numbered tables in the section "Delaware River Operations" are grouped at the end of this section, beginning on page 24.

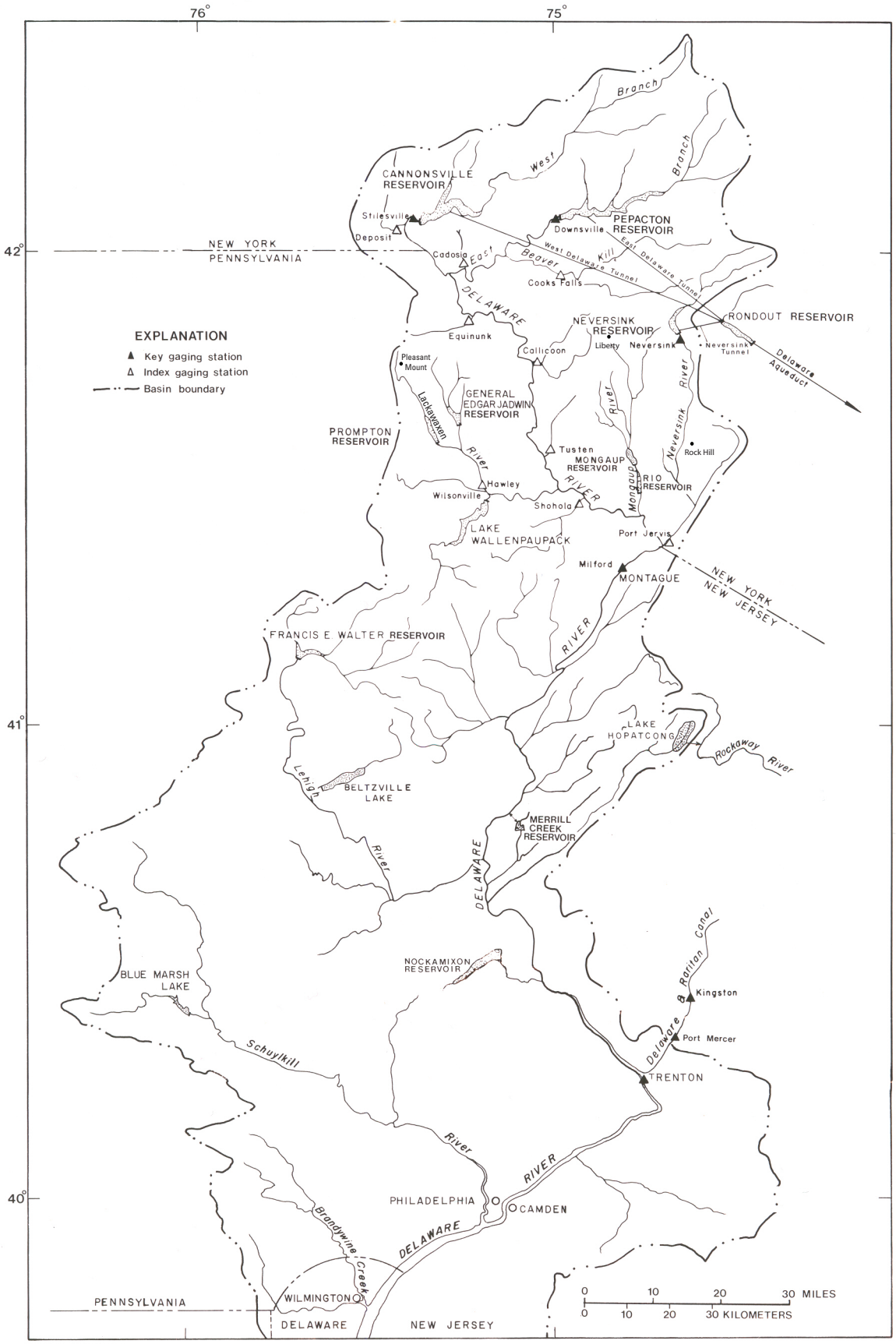

Figure 1. Delaware River Basin above Wilmington, Delaware.

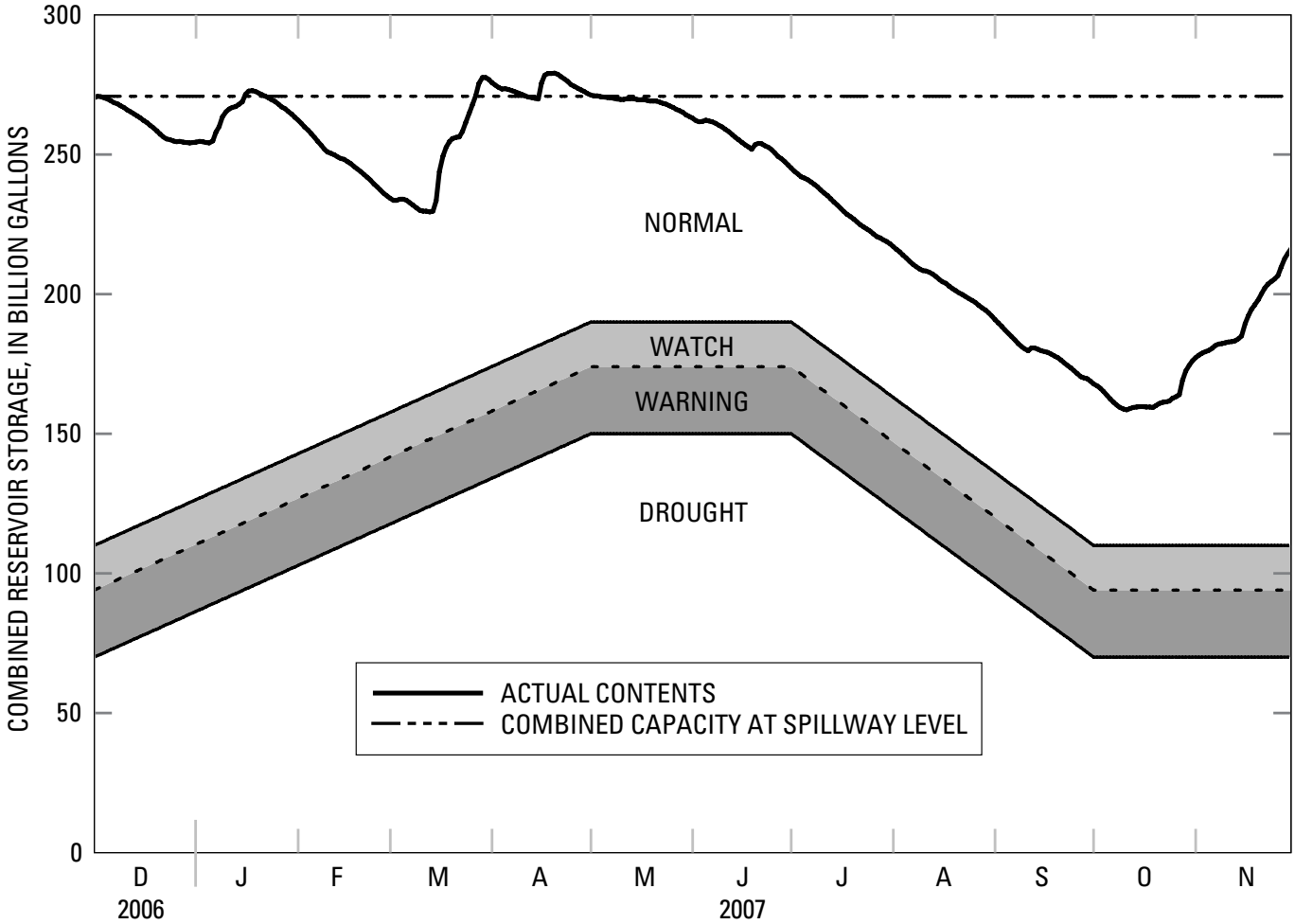

Figure 2. Operation curves and actual contents for New York City reservoirs in the Delaware River Basin, December 1, 2006, to November 30, 2007.

- **Daily excess-release credits**.—Daily credits and deficits during the seasonal release period (June 15 to the following March 15) are computed as the arithmetic difference between the daily mean discharge of the Delaware River at Montague, New Jersey, and 1,750 cubic feet per second (ft^3/s). The daily credit cannot exceed the 24-hour period releases from Pepacton, Cannonsville, and Neversink Reservoirs routed to Montague and made in accordance with direction, except as follows: during the seasonal period, credits also are applied for part or all of other releases from these reservoirs that contribute to the daily mean discharge at Montague between 1,750 ft^3/s and the applicable excess-release rate.

- **Directed releases**.—Controlled releases from New York City reservoirs in the upper Delaware River Basin, designed by the Delaware River Master to meet the Montague flow objective.

- **Diversions**.—The out-of-basin transfer of water by New York City from Pepacton, Cannonsville, and Neversink Reservoirs in the upper Delaware River Basin through the East Delaware, West Delaware, and Neversink Tunnels, respectively, to the City's water-supply system. Also, the out-of-basin transfer of water by New Jersey from the Delaware River through the Delaware and Raritan Canal.

- **Excess quantity**.—As defined by the Decree, the excess quantity of water is equal to 83 percent of the amount by which the estimated consumption by New York City during the year is less than

the City's estimate of continuous safe yield [1,665 million gallons per day (Mgal/d) stipulated by the 1954 Decree] from all its sources of supply obtainable without pumping, except that the excess quantity shall not exceed 70 Bgal. Each year, the seasonal period for release of the excess quantity begins on June 15. The flow objective for the period becomes effective at Montague on that date and remains in effect until the following March 15, or until the cumulative total of excess-release credits equals the applicable excess quantity, whichever occurs first.

- **Index gaging stations**.—Particular sites on tributaries of the upper Delaware River where systematic observations of gage height and discharge are made. These stations are used mainly during the directed-releases season to estimate inflows of surface water to the upper Delaware River.
- **Key gaging stations**.—Particular sites on the East Branch Delaware River, West Branch Delaware River, Neversink River, Delaware and Raritan Canal, and mainstem Delaware River where continuous, systematic observations of gage height and discharge are made. These stations are used on a year-round basis in River Master operations.
- **Maximum reservoir depletion**.—The minimum water-surface level or elevation below which a reservoir ceases to continue making delivery of quantities of water for all purposes for which the reservoir was designed. This also is referred to as minimum full-operating level.
- **Rate of flow**.—Mean discharge for a specified 24-hour period, in cubic feet per second or million gallons per day.
- **Rate of flow at Montague**.—Daily mean discharge of the Delaware River at Montague, New Jersey, computed on a calendar-day basis.
- **Reservoir-controlled releases**.—Controlled releases from reservoirs passed through outlet valves in the dams or through turbines in powerplants. These releases do not include spillway overflow at the reservoirs.
- **Storage or contents**.—Usable volume of water in a reservoir. Unless otherwise indicated, volume is computed on the basis of level pool and above the point of maximum depletion.
- **Time of day**.—Time of day is expressed in 24-hour Eastern Standard Time, which during the report year included a 23-hour day on March 11 and a 25-hour day on November 4.
- **Uncontrolled runoff at Montague**.—Runoff from the 3,480 square mile (mi^2) drainage area above Montague, New Jersey, excluding the drainage area above Pepacton, Cannonsville, Neversink, Wallenpaupack, and Rio Dams, but including spillway overflow at these dams.

Precipitation

Precipitation in the Delaware River Basin above Montague, New Jersey, totaled 46.72 in. during the 2007 report year and was 2.90 in. greater than, or 107 percent of, the long-term (66-year) average. Monthly precipitation ranged from 40 percent of the long-term average in May 2007 to 192 percent of average in October 2007. Data on monthly precipitation during the report year and long-term average precipitation are presented in table 1[2]. These data were computed from records collected at 10 geographically distributed stations by the NWS; the New York City Department of Environmental Protection, Bureau of Water Supply; and the River Master office.

[2]All numbered tables in the section "Delaware River Operation" are grouped at the end of this section, beginning on page 24.

The seasonal period from December to May typically is when surface-water and groundwater reservoirs refill. During this period in 2006–2007, total precipitation was 20.07 in., which is 99 percent of the 66-year average. From June to November, total precipitation was 26.65 in., which is 113 percent of the long-term average. The maximum monthly precipitation was 9.27 in. in October 2007, measured at Pleasant Mount, Pennsylvania; the minimum monthly precipitation was 0.60 in. in May 2007, measured at Milford, Pennsylvania (locations shown on fig. 1).

Operations

December to May

Operations on December 1, 2006, were conducted as prescribed by the Decree. The Montague flow objective was 1,750 ft^3/s, and the allowable diversions to New York City and New Jersey were 800 Mgal/d and 100 Mgal/d, respectively. Conservation releases from New York City reservoirs were made at the rates shown in table 2, as incorporated in Delaware River Basin Commission (DRBC) docket D-77-20 CP (Revision 7).

From December 2006 to May 2007, the first half of the report year, total precipitation was 0.24 in. below average. Monthly precipitation ranged from 40 percent of the long-term average in May 2007 to 148 percent in April 2007 (table 1). Runoff in the upper basin was above normal in January, March, and April, normal in December, and below normal in February and May.

On December 1, 2006, when the 2007 report year began, Pepacton Reservoir contained 140.708 Bgal of water in storage above the point of maximum depletion, or 100.4 percent of the 140.190 Bgal storage capacity. Cannonsville Reservoir contained 96.253 Bgal, or 100.6 percent of the 95.706 Bgal storage capacity. Neversink Reservoir contained 33.259 Bgal, or 95.2 percent of the 34.941 Bgal storage capacity. Combined storage in these reservoirs on December 1, 2006, was 270.220 Bgal, or 99.8 percent of combined capacity. Daily storage in Pepacton, Cannonsville, and Neversink Reservoirs is given in tables 3, 4, and 5, respectively, and combined storage during the report year is shown in figure 2.

On January 9, 2007, in an effort to reduce spill volumes from the New York City reservoirs during flood events, the Decree Parties implemented a temporary spill reduction program. The agreement for a temporary spill reduction program for Pepacton, Cannonsville, and Neversink Reservoirs is presented in Appendix A. On May 25, 2007, the program was extended to September 26, 2007; this agreement is shown in Appendix B. On September 21, 2007, the Decree Parties agreed to an extension of the temporary spill mitigation program to September 30, 2007.

The Decree Parties continued a conservation releases program for the New York City Delaware Basin Reservoirs that began on May 1, 2004. This program established a habitat protection bank, which consisted of an excess release quantity bank, a thermal bank, and a supplemental release bank. It also established flow targets for all three tailwaters at certain USGS gaging stations downstream of the reservoirs. On May 10, 2007, the Decree Parties agreed to extend the program, DRBC Docket No. D-77-20 CP (Revisions 7 and 9), through September 30, 2007. The extended agreement, DRBC Resolution No. 2007–7, is presented in Appendix C.

From December to May, inflow to the City's reservoirs typically exceeds outflow and, consequently, storage increases. The average inflow to Pepacton, Cannonsville, and Neversink Reservoirs for this 6-month period, computed on the basis of the 66-year period from December 1940 to May 2006 was 302.1 Bgal. During the corresponding 6 months of the report year, inflow to the three reservoirs totaled 327.5 Bgal. Evaporation loss is not included in the computations.

Combined storage remained high and fluctuated moderately in December 2006 and January 2007. Combined storage decreased slowly from February to mid-March, then increased to full capacity in late March, and remained near full capacity until the end of May. The combined storage of the reservoirs was about 97 percent of capacity on May 31, 2007.

Combined storage in the three New York City reservoirs was 270.643 Bgal on November 30, 2006, and 263.640 Bgal on May 31, 2007, a net decrease of 7.003 Bgal or 2.6 percent of total capacity. Maximum combined storage from December to May was 279.150 Bgal on April 20, 2007. Maximum storage in Pepacton Reservoir during the December to May period was 143.406 Bgal on April 17; maximum storage in Cannonsville Reservoir was 101.484 Bgal on March 28; and maximum storage in Neversink Reservoir was 35.983 Bgal on April 16, 2007. Pepacton Reservoir spilled from December 1–7, January 16–23, March 27 to April 8, and April 15 to May 7. Cannonsville Reservoir spilled from December 1–8, January 13–26, March 23 to May 4, and May 11–18. Neversink Reservoir spilled from March 31 to April 27. The combined spill volume from the three reservoirs during this period was 102.145 Bgal.

During the December to May period, diversions to Rondout Reservoir by New York City totaled 89.972 Bgal (494 Mgal/d). The forecasted discharge at Montague, exclusive of water released from the City reservoirs, was less than the flow objective on 5 days in May, and releases were directed. The observed daily mean discharge at Montague was greater than the applicable flow objective on all days. Applicable design rates for the USGS gaging station Delaware River at Montague, New Jersey, are presented in table 6.

June to November

Monthly precipitation for the June to November period was above average in July, October, and November, and below average in June, August, and September. Total precipitation during the period was 26.65 in. or 3.14 in. more than the 66-year average (table 1).

Combined storage in the three New York City reservoirs was 262.969 Bgal on June 1, 2007, and 216.317 Bgal on November 30, 2007, a net decrease of 46.652 Bgal or about 17 percent of total capacity. During the June to November period, maximum storage in Pepacton Reservoir was 136.927 Bgal on June 25; 93.120 Bgal in Cannonsville Reservoir on June 1; and 33.067 Bgal in Neversink Reservoir on June 6 and 7. Maximum combined storage in the three reservoirs was 262.969 Bgal on June 1, 2007. There was no spill during this period.

Releases were directed to meet the Montague flow objective on 118 days between June 1 and November 30, 2007, when the forecasted discharge at Montague, exclusive of water released from the New York City reservoirs, was less than the flow objective. Releases at rates designed to protect the fishery and aquatic habitat were made at other times during the period.

From June 1 to June 14, the Montague flow objective was 1,750 ft^3/s. The forecasted flow, exclusive of releases from Pepacton, Cannonsville, and Neversink Reservoirs, was less than the flow objective on 10 days and releases were directed.

The New York City Department of Environmental Protection, Bureau of Water Supply, Quality, and Protection furnished the River Master with the following data for the 2007 calendar year, as stipulated by the Decree:

1. The estimated continuous safe yield from all the City's sources, obtainable without pumping, is 1,665 Mgal/d, or a total during calendar year 2007 of 1.665 Bgal/d x 365 days = 607.725 Bgal.
2. The estimated consumption that the City must provide for, from all its sources of supply during calendar year 2007, is 591.582 + 7.250 = 598.832 Bgal.

On the basis of the Decree and the above-noted data, the aggregate quantity of excess-release water was 83 percent of (607.725 - 598.832), or 7.381 Bgal.

Data on water consumption by the City of New York for each calendar year since 1950, from all sources of supply, are presented in table 7.

As part of the reservoir releases program stipulated in DRBC Docket No. D-77-20 CP (Revision No. 7), about 50 percent of the annual excess release quantity was placed in a habitat protection bank. The remainder of the excess release quantity could be used to provide an increase in the Montague flow objective or could be banked in accordance with the procedures given in the DRBC's Lower Basin Drought Management Plan.

On June 15, 2007, the beginning of the seasonal excess release period, the Montague flow objective was increased to 1,800 ft^3/s. Storage in the New York City reservoirs declined slowly from June to mid-October, after which storage increased steadily through the end of the report year.

On September 27, 2007, a Flexible Flow Management Program (FFMP) was approved, whereby the Decree Parties agreed to manage diversions and releases under the Decree. The FFMP went into effect on October 1, 2007. The FFMP is designed to provide safe and reliable supplies of water essential to serve the needs of more than 17 million people who depend on water from New York City's Cannonsville, Pepacton, and Neversink Reservoirs (City Delaware Basin Reservoirs) and their tailwaters, and the Delaware River; to manage discharges from the City Delaware Basin Reservoirs; to provide flows to help control temperatures in the tailwaters in support of the cold water fishery; to assist in mitigating the impacts of flooding; and to provide flows in the main stem and the Delaware Bay to help protect ecological health, support withdrawal and non-withdrawal uses, and repel salinity. The FFMP agreement can be accessed at the following url: *http://water.usgs.gov/osw/odrm/*.

The FFMP established an Interim Excess Release Quantity, which could be used to help maintain a daily mean flow at Trenton of 3,000 ft^3/s if storage in the City Delaware Basin Reservoirs is in the normal zone. The DRBC requested an additional 100 ft^3/s release from the New York City Reservoirs on a daily basis from October 5–9, 2007, for this purpose. A total of 500 ft^3/s-days of water was released from Cannonsville Reservoir to temporarily augment the Trenton flows.

From June 15 to November 30, 2007, the forecasted flow at Montague, exclusive of releases from the New York City reservoirs, was less than the flow objective on 108 days and releases were directed by the River Master. On 22 days during the June 15 to November 30 period, the observed flow was less than the flow objective. On 19 of these 22 days, observed flows were within 10 percent of the flow objective. Applicable design rates for the USGS gaging station Delaware River at Montague, New Jersey, are presented in table 6.

The total discharge observed at Montague, the portion derived from uncontrolled runoff from the drainage area below the reservoirs, the portion contributed by power reservoirs, and the portion contributed by Pepacton, Cannonsville, and Neversink Reservoirs from May to October are shown in figure 3. In developing the water budget for Montague, uncontrolled runoff was computed as the residual of observed flow minus releases and spills from all reservoirs, and, consequently, was subject to errors in observations, transit times, and routing of the various components of flow. The conservation release from Rio Reservoir is included in the uncontrolled runoff component. The net effect of these uncertainties is incorporated in the computation of uncontrolled runoff. From June 1 to November 30, 2007, diversions from the three New York City Delaware Basin reservoirs to Rondout Reservoir totaled 119.452 Bgal.

Summary of Operations

From December 1, 2006, to November 30, 2007, diversions from the three New York City reservoirs in the upper Delaware River Basin to Rondout Reservoir totaled 209.424 Bgal, and all releases from the three reservoirs to the Delaware River totaled 221.811 Bgal. River Master directed releases to the Delaware River from these reservoirs totaled 55.099 Bgal.

During the year, maximum storage in Pepacton Reservoir was 143.406 Bgal (102.3 percent of capacity) on April 17, 2007; 101.484 Bgal (106.0 percent of capacity) in Cannonsville Reservoir on March 28; and 35.983 Bgal (103.0 percent of capacity) in Neversink Reservoir on April 16. Maximum combined storage in the three reservoirs was 279.150 Bgal (103.1 percent of combined capacity) on April 20, 2007. The combined spill volume from the three reservoirs for the year was 102.145 Bgal.

During the report year, minimum storage in Pepacton Reservoir was 92.382 Bgal (65.9 percent of capacity) on October 19, 2007; 41.753 Bgal (43.6 percent of capacity) in Cannonsville Reservoir on October 11, 2007; and 22.591 Bgal (64.7 percent of capacity) in Neversink Reservoir on October 10, 2007. Minimum combined storage in the three reservoirs was 158.543 Bgal (58.5 percent of combined capacity) on October 11, 2007.

On November 30, 2007, the end of the report year, combined storage in the three reservoirs was 216.317 Bgal or 79.9 percent of combined capacity. From December 1, 2006, to November 30, 2007, the net change in combined storage was -54.326 Bgal, or a decrease equivalent to 20.1 percent of combined capacity.

Combined storage for the three reservoirs on the first day of the month was above median in every month from December to April and in November, and below median in every month from May to October (fig. 4).

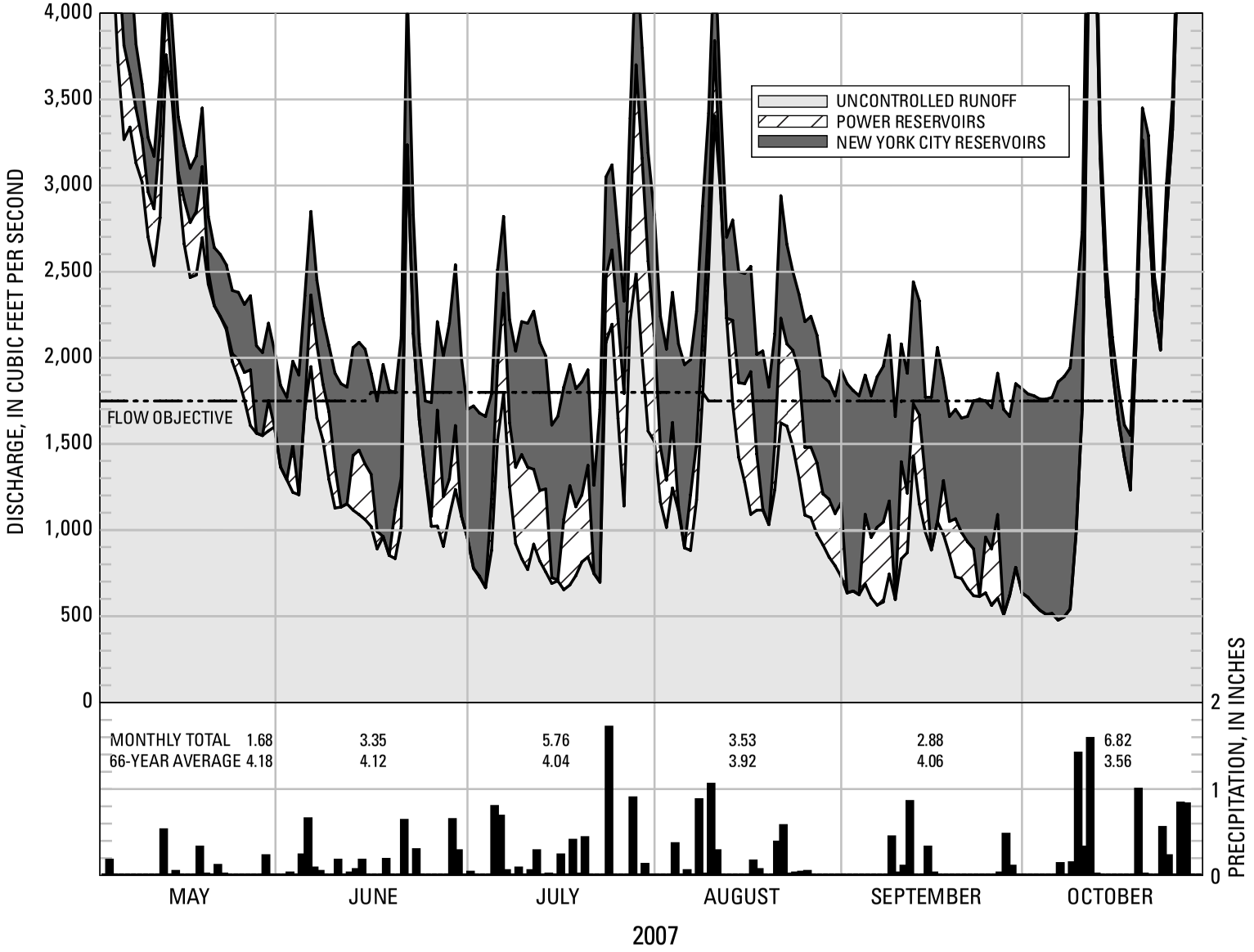

Figure 3. Components of flow, Delaware River at Montague, New Jersey, May 1 to October 31, 2007.

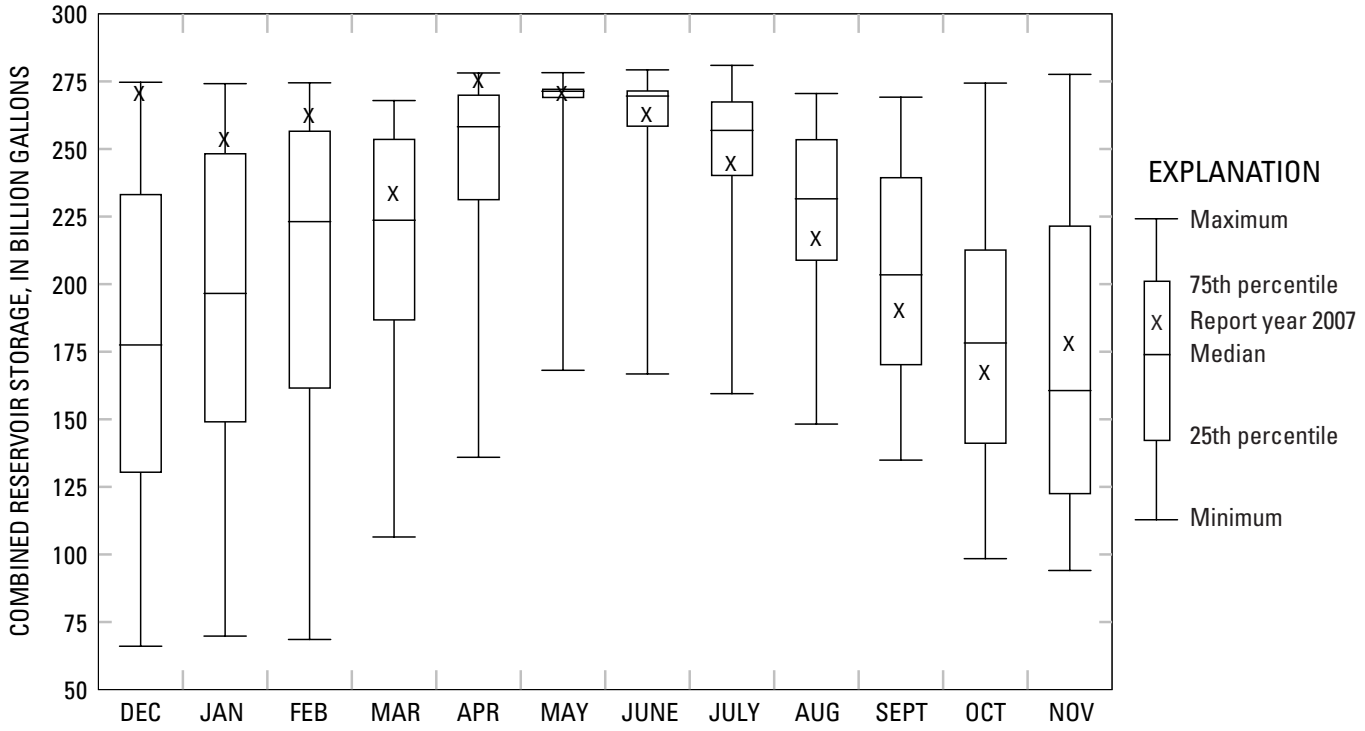

Figure 4. Combined storage in Pepacton, Cannonsville, and Neversink Reservoirs on the first day of the month, December 2006 to November 2007 (this report year), and summary statistics for the reference period, June 1967 to November 2006.

Streamflow

Components of Flow, Delaware River at Montague, New Jersey

The data and computations of the various components of flow form the basic operational records used by the River Master to carry out specific responsibilities related to the Montague formula. The operational record has two parts: forecasted flow at Montague, exclusive of controlled releases from New York City's reservoirs (table 8), and segregation of components of daily mean flow at Montague (table 9).

The following components may be present in the flow of the Delaware River at Montague:

1. Controlled releases from Lake Wallenpaupack on Wallenpaupack Creek, for the production of hydroelectric power.
2. Controlled releases from Rio Reservoir on Mongaup River, for the production of hydroelectric power.
3. Runoff from the uncontrolled area above Montague, including spills from New York City reservoirs, Lake Wallenpaupack, and Rio Reservoir.
4. Controlled releases from Pepacton, Cannonsville, and Neversink Reservoirs of New York City.

The releases from New York City's reservoirs necessary to meet the Montague flow objective were computed on the basis of the forecasted flow at Montague, exclusive of controlled releases from the City reservoirs.

Time of Travel

Following are average times for the effective travel of water from the various sources of controlled supply to Montague, New Jersey. These times were used for flow routing during the 2007 report year.

Source	Travel time, in hours
Pepacton Reservoir	60
Cannonsville Reservoir	48
Neversink Reservoir	33
Lake Wallenpaupack	16
Rio Reservoir	8

Travel times were computed from reservoir and powerplant operations data and historical streamflow records. The travel times generally are suitable for use in the operations of the River Master. Occasionally, however, significant exceptions are observed. For example, when a large release from Cannonsville Reservoir follows a small release, a substantial portion of the water fills the channel en route, and the remainder may arrive at Montague as much as 66 hours after the time of release. During winter, the formation of ice, together with lower streamflow, gradually increases the resistance to water flow, resulting in increased travel times. Because ice-affected travel times increase gradually over several days, and releases were not directed to meet the Montague flow objective during periods of ice, no adjustments were made to compensate for increased travel times during these periods of the report year.

Segregation of Flow at Montague

The River Master daily operations record of reservoir releases and segregation of the various components contributing to the flow of the Delaware River at Montague, New Jersey, are presented in table 9. The data are arranged to conform to the downstream movement of water from the various sources to Montague. Summation of data across individual rows in the table is equivalent to routing the various flow contributions to Montague, using the above-noted average travel times. Uncontrolled runoff was computed as a residual by subtracting the flow contributions of all other sources from the observed discharge at Montague.

Computation of Directed Releases

During the report year, the River Master used the following information for daily operations: (1) discharges computed from recorded or reported stream gage heights, for various 24-hour periods, absent real-time information on any changes in stage-discharge relations; (2) daily discharge from New York City's three Delaware Basin reservoirs, measured with venturi meters; (3) precipitation reports for the previous 24 hours; (4) actual powerplant releases converted to daily discharges; (5) advance estimates of power demand converted to daily discharges; (6) advance estimates of uncontrolled runoff at Montague; and (7) average travel times for routing water from various sources. Although uncertainty is inherent in the advance estimates, this information is used by necessity in the daily design and direction of reservoir releases.

The 60-hour travel time of water from Pepacton Reservoir to Montague is greater than the travel time of water from any other reservoir in the upper Delaware River Basin. Releases from Cannonsville and Neversink Reservoirs were timed to arrive at Montague concurrently with releases from Pepacton Reser-

voir. To allow for differences in travel times, daily directed releases were scheduled to begin from Pepacton Reservoir at 1200 hours, from Cannonsville Reservoir at 2400 hours, and from Neversink Reservoir at 1500 hours the following day.

Releases from the City's reservoirs required to meet the Montague flow objective were computed from forecasts of releases from Lake Wallenpaupack and Rio Reservoir, and estimates of uncontrolled runoff at Montague. To account for the travel times from these sources to Montague, the computation requires estimates of the following components of flow two or more days in advance: (1) releases from Lake Wallenpaupack; (2) releases from Rio Reservoir; and (3) uncontrolled runoff from the drainage area upstream of Montague. The River Master operations record for computing daily directed release requirements during periods of low flow is given in table 8.

The electric utilities furnished forecasts of power generation and releases. Because the hydroelectric plants were used chiefly for area regulation or meeting peak power demands, the forecasts were subject to various modifying factors, including the vagaries of weather on electricity demand. In addition, because the power companies are members of regional transmission organizations, demand for power outside of the local service area may unexpectedly affect generation schedules. Consequently, at times, the actual use of water for power generation differs considerably from the forecasts used in the design of reservoir releases.

For computational purposes during periods of low flow, estimates of uncontrolled runoff at Montague were treated as two components: (1) current runoff and (2) forecasted increase in runoff from precipitation. Estimates of these components are given in table 8.

During ice-free conditions, current runoff was computed using a routing and recession procedure based on discharges at 0800 hours at the following USGS gaging stations:

Station Name	Drainage Area (mi^2)
Beaver Kill at Cooks Falls, New York	241
Oquaga Creek at Deposit, New York	67.6
Equinunk Creek at Equinunk, Pennsylvania	56.3
Callicoon Creek at Callicoon, New York	110
Tenmile River at Tusten, New York	45.6
Lackawaxen River at Hawley, Pennsylvania	290
Shohola Creek near Shohola, Pennsylvania	83.6
Neversink River at Port Jervis, New York	336

During winter, the advance estimate of uncontrolled runoff (current conditions) was made on the basis of observed flows at a reduced network of gaging stations and the recession curve for computed uncontrolled flow at Montague.

The forecasted runoff from precipitation is shown in table 8 under the heading "Weather Adjustment." Throughout the year, the NWS office in Binghamton, New York, furnished quantitative forecasts of average precipitation and air temperatures for the 3,480-mi^2 drainage basin upstream of Montague, New Jersey. During winter, runoff was estimated on the basis of the current status of snow and ice, along with forecasted precipitation and temperature. During other periods, forecasted precipitation was used to estimate runoff.

The forecasted flow at Montague, exclusive of releases from New York City's Delaware Basin reservoirs (table 8), is computed as the sum of forecasted releases from power reservoirs, estimated uncontrolled runoff including conservation releases from Rio Reservoir, and weather adjustments. If the computed total flow is less than the flow objective at Montague, then the deficiency is made up by releases from the City's reservoirs, as directed by the River Master.

When forecasts of precipitation or powerplant releases were revised appreciably after a release was directed, the release required from the City's reservoirs was recomputed. Commonly, this procedure resulted in a reduced release requirement for New York City reservoirs for that day. Only final figures for releases from New York City reservoirs are given in table 8.

Analysis of Forecasts

Forecasts of streamflow at Montague, developed on the basis of anticipated contributions from the components described previously but excluding releases from New York City's reservoirs, differed on most days from observed flow. Occasionally, variations in the components were partially compensating and observed flows compared favorably with forecasted flows.

The forecasted flow of the Delaware River at Montague, exclusive of releases from the New York City reservoirs, was less than the flow objective on most days from May 27 to October 13, 2007. The following tabulation compares estimates of three components of flow at Montague with actual flow during this period.

Releases and Runoff	Forecasted flow [(ft^3/s)-d]	Actual flow [(ft^3/s)-d]
Power releases		
Lake Wallenpaupack	31,362	36,093
Rio Reservoir	856	928
Runoff from uncontrolled area	132,470	164,438

From May 27 to October 13, actual releases from Lake Wallenpaupack averaged 15 percent greater than forecasted releases, and actual and forecasted releases from Rio Reservoir were 0 ft^3/s on most days. Observed runoff from the uncontrolled area was about 24 percent greater than forecasted runoff.

On any given day, forecasted releases and actual releases can differ considerably. The ranges of actual daily releases from May 27 to October 13, 2007, are as follows: daily releases at Lake Wallenpaupack differed from forecasted releases by 155 ft^3/s less to 1,211 ft^3/s greater, and daily releases at Rio Reservoir differed from forecasted releases by 270 ft^3/s less to 195 ft^3/s greater. On the basis of observed flows at Montague, total directed releases from New York City's Delaware Basin reservoirs during the report year were about 18 percent more than required for exact forecasting.

Comparison of hydrographs of forecasted daily runoff and observed daily runoff from the uncontrolled area (fig. 5) indicates that the forecasts generally were suitable for use in designing releases from New York City's Delaware Basin reservoirs. Numerical adjustments to the designs were made when needed to

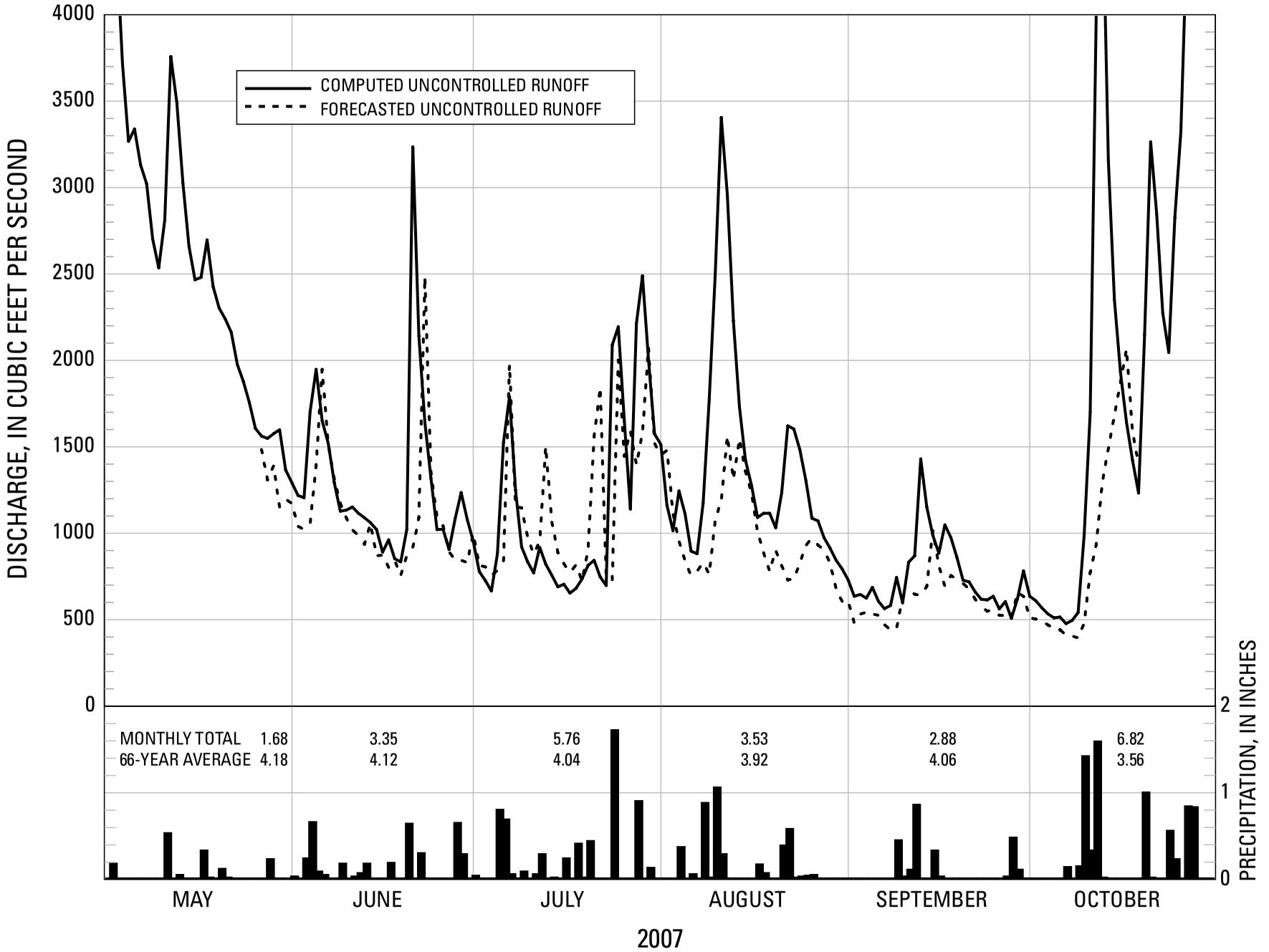

Figure 5. Uncontrolled runoff component, Delaware River at Montague, New Jersey, May 1 to October 31, 2007.

compensate for errors in the forecasts, but, because of travel times, the effects of the adjustments on flows at Montague were not evident until several days after the design date.

Analysis of the precipitation forecasts shows that the total precipitation amount forecasted for the 3-day design periods is reasonably accurate, but often the actual timing of precipitation events may be earlier or later than forecasted. The accuracy of the runoff forecasts is affected greatly by the timing of precipitation events. In addition, if the actual storm track differs from the forecasted track, the amount and timing of runoff can be substantially different than predicted.

Diversions to New York City Water Supply

The 1954 Amended Decree authorizes New York City to divert water from the Delaware River Basin at a rate not to exceed the equivalent of 800 Mgal/d. The Decree stipulates that the diversion rate shall be computed as the aggregate total diversion beginning June 1 of each year divided by the number of days elapsed since the preceding May 31.

Daily diversions during the report year from Pepacton, Cannonsville, and Neversink Reservoirs to the New York City water-supply system (Rondout Reservoir) are given in table 10. A running account of the average rates of combined diversions from the three reservoirs, computed as stipulated by the Decree, also is shown. The following tabulation shows allowable maximum diversion rates and average actual diversions for various periods during the report year.

Effective dates	Allowable diversion (Mgal/d)	Average actual diversion (Mgal/d)
December 1, 2006 to May 31, 2007	800	494
June 1 to November 30, 2007	800	653

During the report year, a total of 209.424 Bgal of water was diverted to the New York City water-supply system. The allowable diversion was 359.500 Bgal.

Storage in New York City Reservoirs

The following tabulation summarizes the "point of maximum depletion" and other pertinent levels and contents of Pepacton, Cannonsville, and Neversink Reservoirs. This information was provided by the New York City Board of Water Supply.

Level	Pepacton Reservoir		Cannonsville Reservoir		Neversink Reservoir	
	Elevation (ft)	Contents (Bgal)	Elevation (ft)	Contents (Bgal)	Elevation (ft)	Contents (Bgal)
Full pool or spillway crest	1,280.00	*140.190	1,150.00	*95.706	1,440.00	*34.941
Point of maximum depletion	1,152.00	*3.511	1,040.00	*1.020	1,319.00	*0.525
Sill of diversion tunnel	1,143.00	*4.200	+1,035.00	*1.564	1,314.00	
Sill of river outlet tunnel	1,126.50		1,020.50		1,314.00	
Dead storage		1.800		0.328		1.680

*Contents shown are quantities stored between listed elevations.

+Elevation of mouth of inlet channel of diversion works.

Daily storage in Pepacton, Cannonsville, and Neversink Reservoirs, above the "point of maximum depletion" or minimum full-operating level, is given in tables 3, 4, and 5.

On December 1, 2006, combined storage in the three reservoirs was 270.220 Bgal, or 99.8 percent of combined capacity. Combined storage remained high throughout the winter, declined seasonally during the summer, and increased steadily in late fall. The three reservoirs spilled a total of 102.145 Bgal during the year. Combined storage reached a maximum for the report year on April 20, 2007, at 279.150 Bgal. Combined storage was 216.317 Bgal, or 79.9 percent of combined capacity, on November 30, 2007.

Comparison of River Master Operations Data With Other Streamflow Records

River Master operations are conducted on a day-to-day basis and, by necessity, use preliminary data on streamflow. In this section, records used in River Master operations are compared to final data published for selected USGS gaging stations. Data on releases were reported in million gallons per day and converted to cubic feet per second for use in the comparisons.

Releases from New York City Reservoirs

River Master operations data on controlled releases from Pepacton, Cannonsville, and Neversink Reservoirs to the Delaware River were furnished by the New York City Department of Environmental Protection. These data were obtained from calibrated instruments connected to venturi meters installed in the outlet conduits of the reservoirs.

The USGS gaging station on East Branch Delaware River at Downsville, New York, is 0.5 mile downstream from Downsville Dam (fig. 1). Discharge measured at this station includes releases from Pepacton

Reservoir and a small amount of seepage and any runoff that enters the channel between the dam and the gaging station. The drainage area is 371 mi^2 at the dam and 372 mi^2 at the gaging station.

The following tabulation compares releases from Pepacton Reservoir (table 9), reported by New York City, to the final records for the USGS gaging station on East Branch Delaware River at Downsville, New York (table 11), for the flow objectives shown.

Flow objective (ft^3/s)	60	85	185	700
Number of USGS daily mean discharge values used in comparison	42	16	36	43
New York City-measured mean flow (ft^3/s)	60.7	84.8	185	699
USGS-computed mean flow (ft^3/s)	56.7	76.4	172	696
Percent difference	+7.1	+11.0	+7.6	+0.4

The differences at the four flow objectives do not exceed 11 percent. The instruments connected to the venturi meters were recalibrated periodically by New York City to improve the accuracy of the recorded flow data.

The USGS gaging station on West Branch Delaware River at Stilesville, New York, is 1.4 miles downstream from Cannonsville Dam (fig. 1). Discharge measured at this station includes releases from Cannonsville Reservoir and runoff from 2 mi^2 of drainage area between the dam and the gaging station. The drainage area is 454 mi^2 at the dam and 456 mi^2 at the gaging station. The gaging-station records are rated fair at flows greater than 100 ft^3/s and poor at flows less than 100 ft^3/s. A rating of "fair" means that about 95 percent of the daily discharges are within 15 percent of the true discharge, whereas a rating of "poor" means that daily discharges have less than "fair" accuracy. The records include runoff from the area between the dam and the gaging station, and seepage near the base of the dam. The final discharge record for the USGS gaging station on West Branch Delaware River at Stilesville, New York, is presented in table 12.

The USGS gaging station on Neversink River at Neversink, New York, is 1,650 ft downstream from Neversink Dam (fig. 1). Discharge measured at this station includes releases from Neversink Reservoir and, during storms, a small amount of runoff that originates between the dam and the gaging station. The drainage area is 92.5 mi^2 at the dam and 92.6 mi^2 at the gaging station.

The following tabulation compares releases from Neversink Reservoir (table 9), reported by New York City, to the final records for the USGS gaging station on Neversink River at Neversink, New York (table 13), for the flow objectives shown.

Flow objective (ft^3/s)	45	70	85	130	190
Number of USGS daily mean discharge values used in comparison	40	10	69	14	18
New York City-measured mean flow (ft^3/s)	44.9	69.6	85.1	131	190
USGS-computed mean flow (ft^3/s)	45.3	67.8	84.3	120	177
Percent difference	-0.9	+2.7	+0.9	+9.2	+7.3

The differences at all flow objectives are less than 10 percent.

Delaware River at Montague, New Jersey

The River Master's operations record for the Delaware River at Montague, New Jersey (table 9), showed 0.1 percent less discharge for the report year than the published USGS record for the gaging station (table 14). Daily values for the two records were in good agreement, except during ice-affected periods and in June.

Diversion Tunnels

Records of diversions through the East Delaware, West Delaware, and Neversink Tunnels (fig. 1) were furnished by the New York City Department of Environmental Protection. These records were obtained from the City's calibrated instruments connected to venturi meters installed in the tunnel conduits. The measured flows were transmitted electronically on a 15-second interval to a City computer and, on 5-minute intervals, release and diversion quantities for the preceding 5-minute period were computed using the instantaneous rate-of-flow data from each instrument. These 5-minute quantities were then summed to compute daily total flows, which were reported to the River Master's office on a daily basis. On a weekly basis, the diversion figures were checked against the flow meter totalizer readings and corrected when necessary.

The East Delaware Tunnel is used to divert water from Pepacton Reservoir to Rondout Reservoir. Conditions in the outlet channel of the East Delaware Tunnel were unfavorable for flow measurements during the report year because of high water levels in Rondout Reservoir.

The hydroelectric powerplant at the downstream end of the East Delaware Tunnel operated most days of the report year. When the powerplant was not in operation, some water leaked through the wicket gates and was not recorded on the totalizer. A current-meter measurement made in 1989 shows that the (assumed constant) rate of leakage is about 8.0 Mgal/d. Because the powerplant was not in operation for the equivalent of 56 days during the 2007 report year, the estimated quantity of unmeasured leakage was about 0.4 Bgal.

The West Delaware Tunnel is used to divert water from Cannonsville Reservoir to Rondout Reservoir. Inspections of the channel below the outlet, when valves were closed, revealed only negligible leakage. A hydroelectric powerplant uses water diverted through the West Delaware Tunnel, but the plant operates only when diversions are less than 300 Mgal/d. When the powerplant is not operating, the valves on the pipelines to the plant are closed, and there is no leakage through the system.

The Neversink Tunnel is used to divert water from Neversink Reservoir to Rondout Reservoir. A hydroelectric powerplant uses water diverted through the Neversink Tunnel. When the powerplant is not operating and the main valve on the diversion tunnel is open, leakage develops that is not recorded on the venturi instruments. One current-meter measurement made in 1999 showed a leakage rate of 16.2 ft^3/s (10.5 Mgal/d). When the powerplant is operating, the leakage is included in the recorded flow. No leakage occurs when the main valve on the tunnel is closed. During the 2007 report year, the powerplant did not operate on most days and was not operated the equivalent of 273 days. Using the leakage rate noted above and records of powerplant operation, about 2.9 Bgal of water was diverted but not recorded.

Diversions by New Jersey

The Amended Decree authorizes New Jersey to divert water from the Delaware River and its tributaries in New Jersey, to areas outside of the Delaware River Basin, without compensating releases. These diversions may not exceed 100 Mgal/d as a monthly average, and the daily mean diversion may not exceed 120 Mgal/d. The USGS gaging station on Delaware and Raritan Canal at Port Mercer, New Jersey (fig. 1), is used as the official control point for measuring diversions by New Jersey (table 15).

The following tabulation shows the allowable diversion by New Jersey, the period it was in effect, and the maximum monthly diversion during the report year.

Effective dates	Allowable monthly average diversion (Mgal/d)	Maximum monthly average diversion (Mgal/d)	Month of maximum average diversion
Dec. 1, 2006 to Nov. 30, 2007	100	96.7	February

The maximum daily mean diversion was 104 Mgal on February 21, 2007. Diversions by New Jersey did not exceed the limits stipulated by the Decree.

Conformance of Operations Under the Amended Decree of the U.S. Supreme Court Entered June 7, 1954

From December 1, 2006, to November 30, 2007, operations of the Delaware River Master were conducted as stipulated by the Decree.

Diversions from the Delaware River Basin to the New York City water-supply system did not exceed those authorized by the Decree. Under compensating releases of the Montague Formula, New York City released water from its reservoirs at rates designed by the River Master to meet the applicable flow objectives at Montague, New Jersey. During the report year, New York City complied fully with all directives and requests of the River Master.

Diversions from the Delaware River Basin by New Jersey were within limits stipulated by the Decree. New Jersey complied fully with all directives and requests of the River Master.

Table 1. Precipitation in the Delaware River Basin above Montague, New Jersey.
(Source: National Weather Service, New York City Department of Environmental Protection, and Office of the Delaware River Master)

[All values, except percentages, in inches]

Month	December 1940 to November 2006 Monthly Average	December 2006 to November 2007			
		Amount	Percent of average	Excess (+) or deficit (-)	
				Month	Cumulative
December	3.40	2.12	62	-1.28	-1.28
January	3.05	3.92	129	+0.87	-.41
February	2.59	3.12	120	+.53	+.12
March	3.33	3.66	110	+.33	+.45
April	3.76	5.57	148	+1.81	+2.26
May	4.18	1.68	40	-2.50	-.24
June	4.12	3.35	81	-.77	-1.01
July	4.04	5.76	143	+1.72	+.71
August	3.92	3.53	90	-.39	+.32
September	4.06	2.88	71	-1.18	-.86
October	3.56	6.82	192	+3.26	+2.40
November	3.81	4.31	113	+.50	+2.90
12 months	43.82	46.72	107		

Table 2. Conservation release rates for New York City reservoirs in the Delaware River Basin.
[Source: DRBC Docket No. D-77-20 CP (Revision 7)]

[All values in cubic feet per second]

Reservoir	Effective dates	Conservation release rates			
		Normal	Watch	Warning	Drought
Pepacton	December 1 to November 30	35	30	25	19
Cannonsville	December 1 to May 31	45	38	32	23
	June 1 to August 31	60	51	43	23
	September 1 to November 30	45	38	32	23
Neversink	December 1 to November 30	25	21	18	15

Table 3. Storage in Pepacton Reservoir, New York, for year ending November 30, 2007.
(River Master daily operations record; gage reading at 0800 hours)

[Storage in millions of gallons above elevation 1,152.00 ft. Add 7,711 million gallons for total contents above sill of outlet tunnel, elevation 1,126.50 ft. Storage at spillway level is 140,190 million gallons]

DAY	DEC	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV
1	140,708	130,138	136,127	123,394	141,524	140,765	136,854	134,228	119,036	106,468	96,144	97,480
2	141,283	130,085	135,475	123,118	141,227	140,597	136,581	133,455	118,545	106,132	96,295	97,603
3	141,135	130,067	134,805	123,084	140,876	140,597	136,472	132,880	118,107	105,589	96,385	97,618
4	140,950	130,067	134,066	123,101	140,708	140,653	136,526	132,308	117,619	105,082	96,114	97,571
5	140,844	130,049	133,329	122,894	140,783	140,597	136,781	132,022	117,048	104,494	95,735	97,480
6	140,486	130,635	132,665	122,601	140,671	140,436	136,763	131,648	116,545	103,909	95,297	97,511
7	140,246	132,308	131,862	122,292	140,523	140,283	136,617	131,167	116,043	103,357	95,010	97,603
8	140,043	133,419	131,149	121,968	140,338	140,140	136,435	130,688	115,659	102,806	94,725	97,603
9	139,730	135,130	130,493	121,677	140,098	139,951	136,235	130,226	115,194	102,539	94,471	97,495
10	139,436	136,109	129,908	121,368	139,840	139,804	135,982	129,731	114,911	102,179	94,351	97,419
11	139,032	136,690	129,394	121,214	139,601	139,804	135,638	129,236	114,812	101,851	94,171	97,298
12	138,645	137,000	128,972	121,077	139,326	139,767	135,348	128,778	114,412	102,242	94,066	97,115
13	138,094	137,273	128,514	120,924	139,013	139,619	134,895	128,146	114,031	102,117	93,961	97,069
14	137,547	137,748	128,198	120,958	138,811	139,472	134,498	127,512	113,749	101,867	93,767	97,252
15	136,945	138,223	127,952	122,498	138,609	139,271	134,192	126,953	113,239	101,633	93,557	97,404
16	136,290	139,509	127,565	126,254	141,783	139,472	133,923	126,464	112,794	101,460	93,288	99,336
17	135,711	140,394	127,198	128,286	143,406	139,583	133,707	125,905	112,580	101,164	92,961	100,435
18	135,058	140,783	126,796	129,660	143,200	139,455	133,437	125,453	112,152	100,761	92,679	101,086
19	134,437	140,894	126,412	130,581	142,826	139,216	133,042	125,001	111,726	100,404	92,382	101,538
20	133,725	140,765	126,062	130,989	142,715	139,252	135,058	124,551	111,301	100,001	92,501	102,320
21	133,132	140,579	125,696	131,113	142,547	139,234	135,783	123,945	110,958	99,614	92,650	103,357
22	132,469	140,394	125,679	131,149	142,248	139,087	136,326	123,428	110,631	99,151	92,620	104,098
23	131,933	140,264	125,453	131,951	141,987	138,829	136,563	122,929	110,208	98,705	92,487	104,399
24	131,635	139,914	125,123	132,934	141,764	138,682	136,781	122,533	109,754	98,245	92,472	104,590
25	131,291	139,546	124,759	134,426	141,431	138,443	136,927	122,138	109,396	97,755	92,724	104,685
26	131,078	139,068	124,430	135,874	141,172	138,332	136,799	121,677	109,089	97,282	92,799	104,875
27	131,081	138,553	124,065	137,748	140,801	138,113	136,290	121,197	108,669	96,825	92,932	106,180
28	130,795	138,168	123,722	140,486	140,876	137,985	136,000	120,855	108,298	96,917	95,071	107,444
29	130,599	137,693		141,857	140,913	137,784	135,602	120,463	107,863	96,825	96,204	108,395
30	130,422	137,145		142,099	140,838	137,364	134,949	120,038	107,476	96,521	96,886	108,959
31	130,245	136,636		141,857		137,108		119,546	107,028		97,252	
Change	-10,501	+6,391	-12,914	+18,135	-1,019	-3,730	-2,159	-15,403	-12,518	-10,507	+731	+11,707
Equiv. Mgal/d	-338.7	+206.2	-461.2	+585.0	-34.0	-120.3	-72.0	-496.9	-403.8	-350.2	+23.6	+390.2
Equiv. ft^3/s	-524	+319	-713	+905	-52.5	-186	-111	-769	-625	-542	+36.5	+604
Change for year -31,787 Mgal					Equivalent for year -87.1 Mgal/d					Equivalent for year -135 ft^3/s		

Table 4. Storage in Cannonsville Reservoir, New York, for year ending November 30, 2007.
(River Master daily operations record; gage reading at 0800 hours)

[Storage in millions of gallons above elevation 1,040.00 ft. Add 2,584 million gallons for total contents above sill outlet tunnel, elevation 1,020.50 ft. Storage at spillway level is 95,706 million gallons]

DAY	DEC	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV
1	96,253	91,188	93,364	80,433	99,150	96,269	93,120	81,177	70,033	57,630	48,581	54,288
2	96,414	91,203	92,862	80,101	98,523	96,092	92,694	80,847	69,582	56,959	47,814	54,969
3	96,511	91,081	92,436	80,018	98,007	96,044	92,420	80,516	69,159	56,202	47,035	55,628
4	96,398	90,914	91,994	80,281	97,669	95,770	92,451	80,308	68,669	55,616	46,235	56,165
5	96,334	90,701	91,492	80,447	97,637	95,630	92,420	80,143	68,099	55,250	45,367	56,629
6	96,173	90,899	90,990	80,405	97,524	95,630	92,238	79,963	67,635	54,932	44,511	57,154
7	95,980	91,705	90,397	80,060	97,315	95,600	92,055	79,714	67,203	54,591	43,688	57,985
8	95,835	92,299	89,773	79,645	97,090	95,600	91,659	79,327	66,770	54,217	42,973	58,485
9	95,660	93,455	89,210	79,078	96,848	95,508	91,218	78,940	66,337	53,914	42,310	58,778
10	95,508	94,307	88,906	78,512	96,655	95,523	90,807	78,498	66,045	53,809	41,953	59,218
11	95,265	94,824	88,876	78,429	96,382	95,615	90,382	77,973	65,968	53,681	41,753	59,645
12	95,037	95,234	88,845	78,457	96,140	95,851	89,925	77,710	65,790	54,241	42,237	60,048
13	94,748	95,539	88,678	78,457	96,301	95,915	89,408	77,213	65,472	54,311	42,720	60,390
14	94,580	96,012	88,556	78,761	96,398	95,931	88,967	76,771	65,064	54,252	43,109	60,866
15	94,337	96,543	88,632	80,709	96,398	95,899	88,404	76,233	64,580	53,937	43,435	61,419
16	93,972	97,878	88,419	86,771	97,798	95,722	87,695	75,721	64,186	53,867	43,766	62,810
17	93,713	98,281	88,100	89,971	99,553	95,738	87,146	75,196	63,842	53,891	43,988	64,109
18	93,348	98,184	87,609	91,644	100,502	95,738	86,742	74,685	63,370	53,786	44,155	65,497
19	93,059	97,991	87,161	92,512	100,937	95,738	86,438	74,381	63,027	53,587	44,411	66,477
20	92,679	97,653	86,496	93,136	101,226	95,630	86,178	73,940	62,670	53,366	44,722	67,371
21	92,268	97,396	85,904	93,516	100,985	95,615	86,005	73,715	62,314	53,050	45,067	68,285
22	91,918	97,106	85,152	93,698	100,470	95,493	85,542	73,199	62,033	52,595	45,390	69,358
23	91,614	96,832	84,357	94,854	99,826	95,326	85,022	72,907	61,817	52,094	45,668	70,258
24	91,416	96,494	83,504	96,864	99,182	95,219	84,545	72,589	61,549	51,709	45,946	70,987
25	91,218	96,221	82,753	98,490	98,571	95,022	83,894	72,258	61,205	51,289	46,557	71,676
26	90,975	95,867	81,958	99,697	98,249	94,733	83,287	71,861	60,817	50,834	46,980	72,391
27	90,929	95,463	81,380	100,663	97,927	94,474	82,738	71,424	60,402	50,227	47,458	73,715
28	90,853	95,219	80,806	101,484	97,412	94,291	82,290	71,318	59,975	49,702	49,329	75,390
29	90,792	94,793		101,452	96,945	94,033	81,828	71,079	59,560	49,597	51,126	76,398
30	90,807	94,337		100,776	96,591	93,698	81,524	70,801	59,059	49,119	52,409	77,448
31	91,005	93,820		100,051		93,455		70,483	58,424		53,459	
Change	-5,393	+2,815	-13,014	+19,245	-3,460	-3,136	-11,931	-11,041	-12,059	-9,305	+4,340	+23,989
Equiv. Mgal/d	-174.0	+90.8	-464.8	+620.8	-115.3	-101.2	-397.7	-356.2	-389.0	-310.2	+140.0	+799.6
Equiv. ft^3/s	-269	+140	-719	+960	-178	-156	-615	-551	-602	-480	+217	+1,237

Change for year -18,950 Mgal | Equivalent for year -51.9 Mgal/d | Equivalent for year -80.3 ft^3/s

Table 5. Storage in Neversink Reservoir, New York, for year ending November 30, 2007.
(River Master daily operations record; gage reading at 0800 hours)

[Storage in millions of gallons above elevation 1,319.00 ft. Add 525 million gallons for total contents above sill of outlet tunnel, elevation 1,314.00 ft. Storage at spillway level is 34,941 million gallons]

DAY	DEC	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV
1	33,259	33,173	32,866	30,470	35,100	34,262	32,995	29,792	27,949	26,697	23,135	25,537
2	33,201	33,417	32,767	30,401	35,125	34,301	32,905	29,719	27,883	26,642	23,020	25,612
3	33,062	33,437	32,667	30,487	35,185	34,340	32,876	29,549	27,813	26,570	22,874	25,671
4	32,885	33,374	32,676	30,579	35,090	34,291	32,900	29,428	27,732	26,503	22,744	25,725
5	32,743	33,336	32,671	30,616	35,175	34,316	33,057	29,405	27,640	26,278	22,717	25,775
6	32,567	33,393	32,533	30,520	35,090	34,399	33,067	29,419	27,546	25,950	22,682	25,850
7	32,386	33,974	32,391	30,396	35,055	34,473	33,067	29,333	27,442	25,637	22,650	26,026
8	32,227	34,306	32,311	30,273	35,060	34,438	33,053	29,275	27,412	25,238	22,630	26,106
9	32,033	34,907	32,213	30,168	35,045	34,404	33,033	29,199	27,404	24,842	22,595	26,026
10	31,850	34,902	32,108	30,055	35,036	34,345	33,005	29,079	27,421	24,486	22,591	25,967
11	31,648	34,749	32,108	30,073	35,060	34,360	32,977	28,946	27,572	24,185	22,619	25,913
12	31,639	34,562	32,103	30,114	35,085	34,394	32,895	28,839	27,615	24,238	22,646	25,834
13	31,686	34,345	31,976	30,028	35,090	34,468	32,819	28,760	27,584	24,222	22,694	25,775
14	31,789	34,170	31,803	29,995	34,976	34,538	32,733	28,681	27,511	24,177	22,709	25,871
15	31,868	34,028	31,634	30,222	34,897	34,503	32,662	28,609	27,438	24,120	22,713	26,156
16	31,939	34,160	31,429	30,831	35,983	34,350	32,619	28,526	27,391	24,088	22,702	27,322
17	32,000	34,106	31,350	31,141	35,518	34,330	32,567	28,455	27,378	24,031	22,682	27,710
18	32,052	33,920	31,345	31,336	35,284	34,267	32,510	28,390	27,356	23,983	22,669	27,927
19	32,114	33,727	31,332	31,466	35,204	34,204	32,396	28,342	27,309	23,914	22,615	28,076
20	32,066	33,616	31,318	31,555	35,209	34,228	32,377	28,307	27,249	23,854	22,866	28,245
21	31,906	33,514	31,197	31,532	35,204	34,262	32,189	28,250	27,210	23,789	23,107	28,486
22	31,906	33,379	31,095	31,475	35,209	34,199	31,976	28,180	27,202	23,725	23,219	28,690
23	32,019	33,221	30,984	31,532	35,209	34,130	31,597	28,105	27,172	23,669	23,294	28,870
24	32,254	33,192	30,864	31,658	35,150	34,057	31,206	28,114	27,133	23,597	23,314	28,999
25	32,358	33,163	30,854	31,915	35,050	33,969	30,836	28,136	27,094	23,529	23,397	29,119
26	32,477	33,096	30,845	32,241	35,026	33,770	30,447	28,076	27,031	23,461	23,457	29,248
27	32,662	33,043	30,721	32,538	34,981	33,606	30,292	28,005	26,979	23,389	23,549	29,647
28	32,786	33,024	30,607	33,441	34,892	33,456	30,128	27,962	26,927	23,358	24,748	29,814
29	32,866	33,000		34,243	34,670	33,283	30,019	27,944	26,868	23,294	25,118	29,787
30	32,962	32,914		34,665	34,463	33,144	29,856	28,014	26,795	23,211	25,313	29,910
31	33,048	32,862		34,951		33,077		28,023	26,744		25,449	
Change	-451	-186	-2,255	+4,344	-488	-1,386	-3,221	-1,833	-1,279	-3,533	+2,238	+4,461
Equiv. Mgal/d	-14.5	-6.0	-80.5	+140.1	-16.3	-44.7	-107.4	-59.1	-41.3	-117.8	+72.2	+148.7
Equiv. ft^3/s	-22.5	-9.3	-125	+217	-25.2	-69.2	-166	-91.5	-63.8	-182	+112	+230

Change for year -3,589 Mgal | Equivalent for year -9.8 Mgal/d | Equivalent for year -15.2 ft^3/s

Table 6. Design rates for Delaware River at Montague, New Jersey, gaging station, December 1, 2006, to November 30, 2007. (Source: Office of the Delaware River Master)

[Rates in cubic feet per second]

Effective dates	Montague Design Rate
December 1, 2006 to June 14, 2007	1,750
June 15 to August 9, 2007	1,800
August 10 to November 30, 2007	1,750

Table 7. Consumption of water by New York City, 1950 to 2007.
(Source: New York City Department of Environmental Protection, Bureau of Water Supply)

[Mgal/d, million gallons per day; Bgal, billion gallons]

Year	Average daily consumption			Annual Consumption (Bgal)
	City Proper (Mgal/d)	Outside Communities (Mgal/d)	Total (Mgal/d)	
1950	953.3	29.1	982.4	358.576
51	1,041.9	28.1	1,070.0	390.550
52	1,087.0	32.7	1,119.7	409.810
53	1,093.9	44.6	1,138.5	415.552
54	1,063.4	46.3	1,109.7	405.040
1955	1,109.9	45.3	1,155.2	421.648
56	1,111.3	48.9	1,160.2	424.633
57	1,169.0	57.2	1,226.2	447.563
58	1,152.9	49.6	1,202.5	438.912
59	1,204.3	60.3	1,264.6	461.579
1960	1,199.4	58.9	1,258.3	460.529
61	1,221.0	64.0	1,285.0	469.022
62	1,207.6	68.8	1,276.4	465.896
63	1,218.0	76.7	1,294.7	472.582
64	1,189.2	79.4	1,268.6	464.295
1965	1,052.1	71.2	1,123.3	409.995
66	1,044.9	73.2	1,118.1	408.128
67	1,135.3	71.0	1,206.3	440.302
68	1,242.0	78.2	1,320.2	483.175
69	1,328.7	80.1	1,408.8	514.229
1970	1,400.3	90.4	1,490.7	544.116
71	1,423.6	87.9	1,511.5	551.695
72	1,412.4	83.0	1,495.4	547.340
73	1,448.9	95.4	1,544.3	563.681
74	1,441.8	96.3	1,538.1	561.409
1975	1,415.0	92.1	1,507.1	550.093
76	1,435.0	95.8	1,530.8	560.264
77	1,483.0	104.7	1,587.7	579.510
78	1,479.4	103.0	1,582.4	577.566
79	1,513.0	104.6	1,617.6	590.426
1980	1,506.3	110.1	1,616.3	591.582
81	1,309.5	100.0	1,409.5	514.475
82	1,383.0	104.8	1,487.8	543.060
83	1,424.2	112.6	1,536.8	561.010
84	1,465.2	113.9	1,579.1	577.963
1985	1,325.4	106.5	1,431.9	522.656
86	1,351.1	115.2	1,466.3	535.200
87	1,447.1	119.8	1,566.9	571.885
88	1,484.3	125.6	1,609.9	589.090
89	1,402.0	113.4	1,515.4	553.158
1990	1,424.4	122.4	1,546.8	564.577
91	1,469.9	123.6	1,593.5	581.628
92	1,368.7	113.9	1,482.6	542.632
93	1,368.9	118.8	1,487.7	543.011
94	1,357.8	119.2	1,477.0	539.105
1995	1,326.1	123.1	1,449.2	528.958
96	1,283.5	120.2	1,403.7	512.351
97	1,201.3	123.5	1,324.8	483.552
98	1,220.0	124.7	1,344.7	490.816
99	1,237.2	128.6	1,365.8	498.517

Table 7. Consumption of water by New York City, 1950 to 2007.—Continued
(Source: New York City Department of Environmental Protection, Bureau of Water Supply)

[Mgal/d, million gallons per day; Bgal, billion gallons]

Year	Average daily consumption			Annual Consumption (Bgal)
	City Proper (Mgal/d)	Outside Communities (Mgal/d)	Total (Mgal/d)	
2000	1,240.4	124.9	1,365.3	499.700
01	1,184.0	128.4	1,312.4	479.026
02	1,135.6	121.1	1,256.7	458.696
03	1,093.7	115.9	1,209.6	441.516
04	1,099.6	117.5	1,217.1	449.461
2005	1,107.6	123.8	1,231.4	449.462
06	1,069.2	116.8	1,186.0	432.890
07	1,114.1	122.9	1,237.0	451.505

Table 8. New York City reservoir release design data.
(River Master daily operation record)

[ft³/s, cubic feet per second; (ft³/s)-d, cubic feet per second days; Col., Column]

Advance estimate of discharge of Delaware River at Montague, New Jersey, exclusive of New York City reservoir releases										Computation of balancing adjustment					
Date of advance estimate	Powerplant release forecasts		Uncontrolled runoff		Montague date	Discharge (ft³/s)	Indicated deficiency	Balancing adjustment (ft³/s)	Directed release (ft³/s)	Adjusted directed release		Actual deficiency		Cumulative difference (ft³/s)-d	Balancing adjustment (ft³/s)
	Lake Wallenpaupack (ft³/s)	Rio Reservoir (ft³/s)	Current condition (ft³/s)	Weather adjustment (ft³/s)						Daily (ft³/s)	Cumulative (ft³/s)-d	Daily (ft³/s)	Cumulative (ft³/s)-d		
2007	Col. 1	Col. 2	Col. 3	Col. 4	2007	Col. 5	Col. 6	Col. 7	Col. 8	Col. 9	Col. 10	Col. 11	Col. 12	Col. 13	Col. 14
MONTAGUE DESIGN RATE = 1,750 (ft³/s) DECEMBER 1, 2006, to JUNE 14, 2007 The estimated Montague discharge was greater than the Montague design rate from December 1, 2006, to May 26, 2007															
May 24	0	0	1,469	16	May 27	1,485	265	0	265	265	265	187	187	78	-8
25	0	0	1,251	57	28	1,308	442	0	442	442	707	202	389	318	-32
26	0	142	1,146	243	29	1,531	219	0	219	219	926	0	389	537	-50
27	0	270	1,111	40	30	1,421	329	0	329	329	1,255	151	540	715	-50
28	0	270	1,195	2	31	1,467	283	-8	275	275	1,530	383	923	607	-50
29	0	96	1,163	9	June 1	1,268	482	-32	450	450	1,980	458	1,381	599	-50
30	288	78	1,041	0	2	1,407	343	-50	293	293	2,273	256	1,637	636	-50
31	0	0	875	147	3	1,022	728	-50	678	678	2,951	545	2,182	769	-50
June 1	0	0	928	123	4	1,051	699	-50	649	640	3,591	30	2,212	1,379	-50
2	480	0	921	473	5	1,874	0	-50	0	0	3,591	0	2,212	1,379	-50
3	480	0	1,201	748	6	2,429	0	-50	0	0	3,591	0	2,212	1,379	-50
4	480	0	1,133	383	7	1,996	0	-50	0	0	3,591	0	2,212	1,379	-50
5	480	0	1,264	50	8	1,794	0	-50	0	0	3,591	64	2,276	1,315	-50
6	288	0	1,123	51	9	1,462	288	-50	238	238	3,829	383	2,659	1,170	-50
7	0	0	1,010	78	10	1,088	662	-50	612	612	4,441	616	3,275	1,166	-50
8	0	0	945	74	11	1,019	731	-50	681	678	5,119	598	3,873	1,246	-50
9	352	0	964	24	12	1,340	410	-50	360	360	5,479	317	4,190	1,289	-50
10	352	0	890	46	13	1,288	462	-50	412	412	5,891	286	4,476	1,415	-50
11	352	0	925	130	14	1,407	343	-50	293	293	6,184	367	4,843	1,341	-50

Col. 1 - Furnished by power company.
Col. 2 - Furnished by power company.
Col. 3 - Computed from index stations.
Col. 4 - Computed increase in runoff based on quantitative precipitation forecasts.
Col. 5 = Col. 1 + Col. 2 + Col. 3 + Col. 4.
Col. 6 = Design rate - Col. 5, when positive; otherwise Col. 6 = 0.
Col. 7 = Col. 14 (4 days earlier).
Col. 8 = Design rate - Col. 5 + Col. 7, when positive; otherwise Col. 8 = 0.
Col. 9 = Col. 7 from Table 9.
Col. 10 = Summation of Col. 9.
Col. 11 = Design rate - (Col. 9 + Col. 10 from Table 9), when positive; otherwise Col. 11 = 0.
Col. 12 = Summation of Col. 11.
Col. 13 = Col. 10 - Col. 12.
Col. 14 = Col. 13 divided by -10, limited to ±50.

Table 8. New York City reservoir release design data.—Continued
(River Master daily operation record)

[ft³/s, cubic feet per second; (ft³/s)-d, cubic feet per second days; Col., Column]

Advance estimate of discharge of Delaware River at Montague, New Jersey, exclusive of New York City reservoir releases										Computation of balancing adjustment					
Date of advance estimate	Powerplant release forecasts		Uncontrolled runoff		Montague date	Discharge (ft³/s)	Indicated deficiency	Balancing adjustment (ft³/s)	Directed release (ft³/s)	Adjusted directed release		Actual deficiency		Cumulative difference (ft³/s)-d	Balancing adjustment (ft³/s)
	Lake Wallenpaupack (ft³/s)	Rio Reservoir (ft³/s)	Current condition (ft³/s)	Weather adjustment (ft³/s)						Daily (ft³/s)	Cumulative (ft³/s)-d	Daily (ft³/s)	Cumulative (ft³/s)-d		
2007	Col. 1	Col. 2	Col. 3	Col. 4	2007	Col. 5	Col. 6	Col. 7	Col. 8	Col. 9	Col. 10	Col. 11	Col. 12	Col. 13	Col. 14
MONTAGUE DESIGN RATE = 1,800 (ft³/s) June 15, 2007, to August 9, 2007															
June 12	352	0	822	47	June 15	1,221	579	--	579	579	579	477	477	102	-10
13	160	0	847	27	16	1,034	766	--	766	758	1,337	808	1,285	52	-5
14	0	0	797	5	17	802	998	--	998	998	2,335	838	2,123	212	-21
15	0	0	795	50	18	845	955	--	955	958	3,293	948	3,071	222	-22
16	352	0	717	39	19	1,108	692	-10	682	681	3,974	681	3,752	222	-22
17	352	0	752	119	20	1,223	577	-5	572	572	4,546	496	4,248	298	-30
18	0	0	749	168	21	917	883	-21	862	862	5,408	0	4,248	1,160	-50
19	0	0	800	290	22	1,090	710	-22	688	688	6,095	0	4,248	1,847	-50
20	0	0	2,476	8	23	2,484	0	-22	0	0	6,095	160	4,408	1,687	-50
21	0	0	1,347	1	24	1,348	452	-30	422	422	6,517	483	4,891	1,626	-50
22	0	0	1,096	0	25	1,096	704	-50	654	654	7,171	719	5,610	1,561	-50
23	737	0	1,044	0	26	1,781	19	-50	0	0	7,171	104	5,714	1,457	-50
24	352	0	885	7	27	1,244	556	-50	506	506	7,677	606	6,320	1,357	-50
25	352	0	807	40	28	1,199	601	-50	551	551	8,228	503	6,823	1,405	-50
26	0	0	762	82	29	844	956	-50	906	906	9,134	193	7,016	2,118	-50
27	0	0	707	124	30	831	969	-50	919	920	10,054	720	7,736	2,318	-50

Col. 1 - Furnished by power company.
Col. 2 - Furnished by power company.
Col. 3 - Computed from index stations.
Col. 4 - Computed increase in runoff based on quantitative precipitation forecasts.
Col. 5 = Col. 1 + Col. 2 + Col. 3 + Col. 4.
Col. 6 = Design rate - Col. 5, when positive; otherwise Col. 6 = 0.
Col. 7 = Col. 14 (4 days earlier).
Col. 8 = Design rate - Col. 5 + Col. 7, when positive; otherwise Col. 8 = 0.
Col. 9 = Col. 7 from Table 9.
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Col. 12 = Summation of Col. 11.
Col. 13 = Col. 10 - Col. 12.
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Table 8. New York City reservoir release design data.—Continued
(River Master daily operation record)

[ft³/s, cubic feet per second; (ft³/s)-d, cubic feet per second days; Col., Column]

Advance estimate of discharge of Delaware River at Montague, New Jersey, exclusive of New York City reservoir releases										Computation of balancing adjustment					
Date of advance estimate	Powerplant release forecasts		Uncontrolled runoff		Montague date	Discharge (ft³/s)	Indicated deficiency	Balancing adjustment (ft³/s)	Directed release (ft³/s)	Adjusted directed release		Actual deficiency		Cumulative difference (ft³/s)-d	Balancing adjustment (ft³/s)
	Lake Wallenpaupack (ft³/s)	Rio Reservoir (ft³/s)	Current condition (ft³/s)	Weather adjustment (ft³/s)						Daily (ft³/s)	Cumulative (ft³/s)-d	Daily (ft³/s)	Cumulative (ft³/s)-d		
2007	Col. 1	Col. 2	Col. 3	Col. 4	2007	Col. 5	Col. 6	Col. 7	Col. 8	Col. 9	Col. 10	Col. 11	Col. 12	Col. 13	Col. 14
June 28	0	0	897	100	July 1	997	803	-50	753	747	10,801	847	8,583	2,218	-50
29	0	0	814	0	2	814	986	-50	936	936	11,737	1,022	9,605	2,132	-50
30	0	0	805	0	3	805	995	-50	945	945	12,682	1,067	10,672	2,010	-50
July 1	0	0	734	21	4	755	1,045	-50	995	995	13,677	1,135	11,807	1,870	-50
2	352	0	689	96	5	1,137	663	-50	613	611	14,288	621	12,428	1,860	-50
3	352	0	643	183	6	1,178	622	-50	572	557	14,845	0	12,428	2,417	-50
4	517	0	614	1,362	7	2,493	0	-50	0	0	14,845	0	12,428	2,417	-50
5	0	0	1,047	106	8	1,153	647	-50	597	598	15,443	178	12,606	2,837	-50
6	0	0	1,115	32	9	1,147	653	-50	603	603	16,046	435	13,041	3,005	-50
7	449	0	974	2	10	1,425	375	-50	325	325	16,371	362	13,403	2,968	-50
8	449	0	880	0	11	1,329	471	-50	421	421	16,792	436	13,839	2,953	-50
9	449	0	906	49	12	1,404	396	-50	346	346	17,138	448	14,287	2,851	-50
10	449	0	824	677	13	1,950	0	-50	0	0	17,138	570	14,857	2,281	-50
11	517	0	782	285	14	1,584	216	-50	166	166	17,304	561	15,418	1,886	-50
12	0	0	858	29	15	887	913	-50	863	863	18,167	1,077	16,495	1,672	-50
13	0	0	774	50	16	824	976	-50	926	926	19,093	1,091	17,586	1,507	-50
14	449	0	719	52	17	1,220	580	-50	530	530	19,623	737	18,323	1,300	-50
15	449	0	649	168	18	1,266	534	-50	484	484	20,107	543	18,866	1,241	-50
16	449	0	645	80	19	1,174	626	-50	576	576	20,683	664	19,530	1,153	-50
17	449	0	565	343	20	1,357	443	-50	393	393	21,076	597	20,127	949	-50
18	519	0	575	982	21	2,076	0	-50	0	0	21,076	425	20,552	524	-50
19	0	0	641	1,203	22	1,844	0	-50	0	0	21,076	1,052	21,604	-528	+50
20	0	0	738	10	23	748	1,052	-50	1,002	1,003	22,079	1,103	22,707	-628	+50
21	449	0	709	17	24	1,175	625	-50	575	578	22,657	0	22,707	-50	+5
22	449	0	616	1,386	25	2,451	0	-50	0	0	22,657	0	22,707	-50	+5
23	449	0	550	895	26	1,894	0	+50	0	0	22,657	0	22,707	-50	+5
24	449	0	1,585	4	27	2,038	0	+50	0	0	22,657	7	22,714	-57	+6
25	520	0	1,260	136	28	1,916	0	+5	0	0	22,657	0	22,714	-57	+6
26	0	0	1,052	528	29	1,580	220	+5	225	225	22,882	0	22,714	168	-17
27	321	0	852	1,222	30	2,395	0	+5	0	0	22,882	0	22,714	168	-17
28	449	0	1,346	173	31	1,968	0	+6	0	0	22,882	0	22,714	168	-17

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Col. 3 - Computed from index stations.
Col. 4 - Computed increase in runoff based on quantitative precipitation forecasts.
Col. 5 = Col. 1 + Col. 2 + Col. 3 + Col. 4.
Col. 6 = Design rate - Col. 5, when positive; otherwise Col. 6 = 0.
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Col. 8 = Design rate - Col. 5 + Col. 7, when positive; otherwise Col. 8 = 0.
Col. 9 = Col. 7 from Table 9.
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Table 8. New York City reservoir release design data.—Continued
(River Master daily operation record)

[ft³/s, cubic feet per second; (ft³/s)-d, cubic feet per second days; Col., Column]

Advance estimate of discharge of Delaware River at Montague, New Jersey, exclusive of New York City reservoir releases										Computation of balancing adjustment					
Date of advance estimate	Powerplant release forecasts		Uncontrolled runoff		Montague date	Discharge (ft³/s)	Indicated deficiency	Balancing adjustment (ft³/s)	Directed release (ft³/s)	Adjusted directed release		Actual deficiency		Cumulative difference (ft³/s)-d	Balancing adjustment (ft³/s)
	Lake Wallenpaupack (ft³/s)	Rio Reservoir (ft³/s)	Current condition (ft³/s)	Weather adjustment (ft³/s)						Daily (ft³/s)	Cumulative (ft³/s)-d	Daily (ft³/s)	Cumulative (ft³/s)-d		
2007	Col. 1	Col. 2	Col. 3	Col. 4	2007	Col. 5	Col. 6	Col. 7	Col. 8	Col. 9	Col. 10	Col. 11	Col. 12	Col. 13	Col. 14
July 29	449	0	1,422	29	Aug. 1	1,900	0	+6	0	0	22,882	0	22,714	168	-17
30	321	0	1,434	46	2	1,801	0	-17	0	0	22,882	320	23,034	-152	+15
31	321	0	1,116	0	3	1,437	363	-17	346	346	23,228	509	23,543	-315	+32
Aug. 1	520	0	943	12	4	1,475	325	-17	308	308	23,536	175	23,718	-182	+18
2	0	0	824	16	5	840	960	-17	943	943	24,479	665	24,383	96	-10
3	0	0	746	10	6	756	1,044	+15	1,059	1,059	25,538	904	25,287	251	-25
4	321	0	770	10	7	1,101	699	+32	731	731	26,269	595	25,882	387	-39
5	321	0	707	124	8	1,152	648	+18	666	666	26,935	297	26,179	756	-50
6	321	0	694	69	9	1,084	716	-10	706	706	27,641	0	26,179	1,462	-50
MONTAGUE DESIGN RATE = 1,750 (ft³/s) August 10, 2007, to November 30, 2007															
7	321	0	726	78	10	1,125	625	--	625	625	625	0	0	625	-50
8	488	0	1,098	96	11	1,682	68	--	68	68	693	0	0	693	-50
9	0	0	997	230	12	1,227	523	--	523	523	1,216	0	0	1,216	-50
10	0	0	1,107	205	13	1,312	438	--	438	438	1,654	0	0	1,654	-50
11	385	0	1,545	0	14	1,930	0	-50	0	0	1,654	0	0	1,654	-50
12	385	0	1,357	0	15	1,742	8	-50	0	0	1,654	0	0	1,654	-50
13	385	0	1,232	0	16	1,617	133	-50	83	83	1,737	0	0	1,737	-50
14	385	0	995	14	17	1,394	356	-50	306	306	2,043	0	0	2,043	-50
15	320	0	843	46	18	1,209	541	-50	491	491	2,534	310	310	2,224	-50
16	0	0	774	5	19	779	971	-50	921	917	3,451	627	937	2,514	-50
17	0	0	897	4	20	901	849	-50	799	798	4,249	718	1,655	2,594	-50
18	257	0	806	5	21	1,068	682	-50	632	632	4,881	246	1,901	2,980	-50
19	257	0	718	12	22	987	763	-50	713	711	5,592	0	1,901	3,691	-50
20	385	0	654	83	23	1,122	628	-50	578	578	6,170	0	1,901	4,269	-50
21	604	0	689	138	24	1,431	319	-50	269	269	6,439	0	1,901	4,538	-50
22	604	0	901	29	25	1,534	216	-50	166	166	6,605	0	1,901	4,704	-50
23	0	0	938	36	26	974	776	-50	726	726	7,331	270	2,171	5,160	-50
24	321	0	912	20	27	1,253	497	-50	447	447	7,778	269	2,440	5,338	-50
25	417	0	892	10	28	1,319	431	-50	381	381	8,159	359	2,779	5,360	-50
26	417	0	821	4	29	1,242	508	-50	458	458	8,617	541	3,340	5,277	-50
27	417	0	679	0	30	1,096	654	-50	604	604	9,221	571	3,911	5,310	-50
28	417	0	603	2	31	1,022	728	-50	678	678	9,899	654	4,565	5,334	-50

Col. 1 - Furnished by power company.
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Col. 4 - Computed increase in runoff based on quantitative precipitation forecasts.
Col. 5 = Col. 1 + Col. 2 + Col. 3 + Col. 4.
Col. 6 = Design rate - Col. 5, when positive; otherwise Col. 6 = 0.
Col. 7 = Col. 14 (4 days earlier).
Col. 8 = Design rate - Col. 5 + Col. 7, when positive; otherwise Col. 8 = 0.
Col. 9 = Col. 7 from Table 9.
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Table 8. New York City reservoir release design data.—Continued
(River Master daily operation record)

[ft³/s, cubic feet per second; (ft³/s)-d, cubic feet per second days; Col., Column]

Advance estimate of discharge of Delaware River at Montague, New Jersey, exclusive of New York City reservoir releases										Computation of balancing adjustment					
Date of advance estimate	Powerplant release forecasts		Uncontrolled runoff		Montague date	Discharge (ft³/s)	Indicated deficiency	Balancing adjustment (ft³/s)	Directed release (ft³/s)	Adjusted directed release		Actual deficiency		Cumulative difference (ft³/s)-d	Balancing adjustment (ft³/s)
	Lake Wallenpaupack (ft³/s)	Rio Reservoir (ft³/s)	Current condition (ft³/s)	Weather adjustment (ft³/s)						Daily (ft³/s)	Cumulative (ft³/s)-d	Daily (ft³/s)	Cumulative (ft³/s)-d		
2007	Col. 1	Col. 2	Col. 3	Col. 4	2007	Col. 5	Col. 6	Col. 7	Col. 8	Col. 9	Col. 10	Col. 11	Col. 12	Col. 13	Col. 14
Aug. 29	321	0	564	43	Sept. 1	928	822	-50	772	772	10,671	594	5,159	5,512	-50
30	0	0	450	30	2	480	1,270	-50	1,220	1,215	11,886	1,115	6,274	5,612	-50
31	0	0	532	0	3	532	1,218	-50	1,168	1,164	13,050	1,104	7,378	5,672	-50
Sept. 1	0	0	543	0	4	543	1,207	-50	1,157	1,156	14,206	1,126	8,504	5,702	-50
2	353	0	533	0	5	886	864	-50	814	809	15,015	659	9,163	5,852	-50
3	353	0	526	0	6	879	871	-50	821	821	15,836	793	9,956	5,880	-50
4	353	0	471	0	7	824	926	-50	876	874	16,710	734	10,690	6,020	-50
5	353	0	442	0	8	795	955	-50	905	904	17,614	704	11,394	6,220	-50
6	286	0	449	0	9	735	1,015	-50	965	962	18,576	582	11,976	6,600	-50
7	0	0	438	192	10	630	1,120	-50	1,070	1,062	19,638	1,152	13,128	6,510	-50
8	353	0	429	237	11	1,019	731	-50	681	681	20,319	353	13,481	6,838	-50
9	353	0	615	32	12	1,000	750	-50	700	695	21,014	535	14,016	6,998	-50
10	353	0	601	41	13	995	755	-50	705	705	21,719	17	14,033	7,686	-50
11	353	0	599	94	14	1,046	704	-50	654	654	22,373	82	14,115	8,258	-50
12	353	0	999	16	15	1,368	382	-50	332	332	22,705	447	14,562	8,143	-50
13	0	0	782	32	16	814	936	-50	886	885	23,590	865	15,427	8,163	-50
14	0	0	665	28	17	693	1,057	-50	1,007	1,007	24,597	701	16,128	8,469	-50
15	354	0	744	12	18	1,110	640	-50	590	590	25,187	463	16,591	8,596	-50
16	354	0	736	0	19	1,090	660	-50	610	610	25,797	700	17,291	8,506	-50
17	354	0	710	0	20	1,064	686	-50	636	635	26,432	685	17,976	8,456	-50
18	354	0	678	0	21	1,032	718	-50	668	664	27,096	764	18,740	8,356	-50
19	354	0	618	0	22	972	778	-50	728	728	27,824	818	19,558	8,266	-50
20	263	0	578	0	23	841	909	-50	859	859	28,683	859	20,417	8,266	-50
21	0	0	548	0	24	548	1,202	-50	1,152	1,146	29,829	1,136	21,553	8,276	-50
22	354	0	558	0	25	912	838	-50	788	788	30,617	791	22,344	8,273	-50
23	354	0	526	0	26	880	870	-50	820	820	31,437	860	23,204	8,233	-50
24	354	0	519	5	27	878	872	-50	822	821	32,258	661	23,865	8,393	-50
25	0	0	428	83	28	511	1,239	-50	1,189	1,189	33,447	1,243	25,108	8,339	-50
26	0	0	405	253	29	658	1,092	-50	1,042	1,040	34,487	1,130	26,238	8,249	-50
27	0	0	400	235	30	635	1,115	-50	1,065	1,065	35,552	967	27,205	8,347	-50

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Col. 5 = Col. 1 + Col. 2 + Col. 3 + Col. 4.
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Table 8. New York City reservoir release design data.—Continued
(River Master daily operation record)

[ft³/s, cubic feet per second; (ft³/s)-d, cubic feet per second days; Col., Column]

Advance estimate of discharge of Delaware River at Montague, New Jersey, exclusive of New York City reservoir releases										Computation of balancing adjustment					
Date of advance estimate	Powerplant release forecasts		Uncontrolled runoff		Montague date	Discharge (ft³/s)	Indicated deficiency	Balancing adjustment (ft³/s)	Directed release (ft³/s)	Adjusted directed release		Actual deficiency		Cumulative difference (ft³/s)-d	Balancing adjustment (ft³/s)
	Lake Wallenpaupack (ft³/s)	Rio Reservoir (ft³/s)	Current condition (ft³/s)	Weather adjustment (ft³/s)						Daily (ft³/s)	Cumulative (ft³/s)-d	Daily (ft³/s)	Cumulative (ft³/s)-d		
2007	Col. 1	Col. 2	Col. 3	Col. 4	2007	Col. 5	Col. 6	Col. 7	Col. 8	Col. 9	Col. 10	Col. 11	Col. 12	Col. 13	Col. 14
Sept. 28	0	0	508	2	Oct. 1	510	1,240	-50	1,190	1,184	36,736	1,114	28,319	8,417	-50
29	0	0	503	0	2	503	1,247	-50	1,197	1,181	37,917	1,141	29,460	8,457	-50
30	0	0	492	0	3	492	1,258	-50	1,208	1,211	39,128	1,181	30,641	8,487	-50
Oct. 1	0	0	470	0	4	470	1,280	-50	1,230	1,227	40,355	1,217	31,858	8,497	-50
2	0	0	448	0	5	448	1,302	-50	1,252	1,250	41,605	1,240	33,098	8,507	-50
3	0	0	437	5	6	442	1,308	-50	1,258	1,255	42,860	1,235	34,333	8,527	-50
4	0	0	411	0	7	411	1,339	-50	1,289	1,283	44,143	1,273	35,606	8,537	-50
5	0	0	406	0	8	406	1,344	-50	1,294	1,294	45,437	1,254	36,860	8,577	-50
6	0	0	395	0	9	395	1,355	-50	1,305	1,299	46,736	1,209	38,069	8,667	-50
7	0	0	426	55	10	481	1,269	-50	1,219	1,220	47,956	760	38,829	9,127	-50
8	0	0	427	346	11	773	977	-50	927	929	48,885	49	38,878	10,007	-50
9	0	0	434	501	12	935	815	-50	765	765	49,650	0	38,878	10,772	-50
10	0	0	992	305	13	1,297	453	-50	403	403	50,053	0	38,878	11,175	-50
The estimated Montague discharge was greater than the Montague design rate from October 14, 2007, to October 16, 2007.															
14	0	0	2,066	0	17	2,066	0	-50	0	0	50,053	107	38,985	11,068	-50
15	0	0	1,574	18	18	1,592	158	-50	108	108	50,161	327	39,312	10,849	-50
16	0	0	1,341	55	19	1,396	354	-50	304	308	50,469	508	39,820	10,649	-50
The estimated Montague discharge was greater than the Montague design rate from October 20, 2007, to October 21, 2007.															
19	0	0	893	362	22	1,255	495	-50	445	443	50,912	0	39,820	11,092	-50
The estimated Montague discharge was greater than the Montague design rate from October 23, 2007, to November 30, 2007.															

Col. 1 - Furnished by power company.
Col. 2 - Furnished by power company.
Col. 3 - Computed from index stations.
Col. 4 - Computed increase in runoff based on quantitative precipitation forecasts.
Col. 5 = Col. 1 + Col. 2 + Col. 3 + Col. 4.
Col. 6 = Design rate - Col. 5, when positive; otherwise Col. 6 = 0.
Col. 7 = Col. 14 (4 days earlier).
Col. 8 = Design rate - Col. 5 + Col. 7, when positive; otherwise Col. 8 = 0.
Col. 9 = Col. 7 from Table 9.
Col. 10 = Summation of Col. 9.
Col. 11 = Design rate - (Col. 9 + Col. 10 from Table 9), when positive; otherwise Col. 11 = 0.
Col. 12 = Summation of Col. 11.
Col. 13 = Col. 10 - Col. 12.
Col. 14 = Col. 13 divided by -10, limited to ±50.

Table 9. Controlled releases from reservoirs in the upper Delaware River Basin and segregation of flow of Delaware River at Montague, New Jersey. (River Master daily operation record)

[Mean discharge in cubic feet per second for 24 hours; Col., Column; Cumul., Cumulative]

Controlled Releases from New York City Reservoirs					Controlled Releases from Power Reservoirs			Segregation of Flow, Delaware River at Montague, New Jersey					
Directed		Pepacton	Cannonsville	Neversink	Date	Lake Wallenpaupack	Rio Reservoir	Date	Controlled Releases			Computed uncontrolled	Total
									New York City Reservoirs		Powerplants		
Date	Amount								Directed	Other			
2006	Col. 1	Col. 2	Col. 3	Col. 4	2006	Col. 5	Col. 6	2006	Col. 7	Col. 8	Col. 9	Col. 10	Col. 11
Nov. 28	0	181	998	190	Nov. 30	908	433	Dec. 1	0	1,369	1,341	4,910	7,620
29	0	51	998	190	Dec. 1	782	387	2	0	1,239	1,169	7,512	9,920
30	0	699	998	190	2	908	387	3	0	1,887	1,295	7,918	11,100
Dec. 1	0	699	998	183	3	908	369	4	0	1,880	1,277	6,643	9,800
2	0	699	998	136	4	829	234	5	0	1,833	1,063	5,844	8,740
3	0	699	998	91	5	832	177	6	0	1,788	1,009	5,133	7,930
4	0	699	998	85	6	832	170	7	0	1,782	1,002	4,516	7,300
5	0	699	999	85	7	745	177	8	0	1,783	922	4,015	6,720
6	0	699	999	85	8	525	121	9	0	1,783	646	3,581	6,010
7	0	699	999	85	9	574	0	10	0	1,783	574	3,393	5,750
8	0	699	998	85	10	510	0	11	0	1,782	510	3,278	5,570
9	0	699	998	85	11	278	227	12	0	1,782	505	3,113	5,400
10	0	699	999	85	12	285	131	13	0	1,783	416	3,011	5,210
11	0	699	1,001	85	13	278	0	14	0	1,785	278	3,247	5,310
12	0	699	1,002	85	14	330	0	15	0	1,786	330	3,254	5,370
13	0	699	1,002	85	15	339	0	16	0	1,786	339	3,005	5,130
14	0	699	1,001	85	16	274	0	17	0	1,785	274	2,821	4,880
15	0	699	1,001	85	17	228	0	18	0	1,785	228	2,657	4,670
16	0	699	999	85	18	249	0	19	0	1,783	249	2,568	4,600
17	0	699	998	85	19	193	0	20	0	1,782	193	2,445	4,420
18	0	699	998	85	20	227	0	21	0	1,782	227	2,321	4,330
19	0	699	996	85	21	241	0	22	0	1,780	241	2,249	4,270
20	0	699	996	85	22	181	160	23	0	1,780	341	2,789	4,910
21	0	682	999	85	23	0	691	24	0	1,766	691	3,933	6,390
22	0	589	1,001	85	24	0	688	25	0	1,675	688	3,607	5,970
23	0	447	1,001	85	25	40	496	26	0	1,533	536	3,591	5,660
24	0	277	999	85	26	520	0	27	0	1,361	520	5,169	7,050
25	0	184	998	85	27	532	0	28	0	1,267	532	5,001	6,800
26	0	184	998	85	28	536	0	29	0	1,267	536	4,327	6,130
27	0	184	941	85	29	268	74	30	0	1,210	342	4,018	5,570
28	0	186	766	85	30	301	337	31	0	1,037	638	3,655	5,330
Total	0	17,644	30,675	3,105		13,653	5,259		0	51,424	18,912	123,524	193,860

Col. 2 - 24 hours beginning 1200 of date shown.
Col. 3 - 24 hours ending 2400 one day later.
Col. 4 - 24 hours beginning 1500 one day later.
Col. 5 - 24 hours beginning 0800 of date shown.
Col. 6 - 24 hours beginning 1600 of date shown.

Col. 7 = Col. 2 + Col. 3 + Col. 4 in response to direction (Col. 1).
Col. 8 = Col. 2 + Col. 3 + Col. 4 - Col. 7.
Col. 9 = Col. 5 + Col. 6.
Col. 10 = Col. 11 - Col. 7 - Col. 8 - Col. 9.
Col. 11 = 24 hours of calendar day shown.

Table 9. Controlled releases from reservoirs in the upper Delaware River Basin and segregation of flow of Delaware River at Montague, New Jersey.—Continued
(River Master daily operation record)

[Mean discharge in cubic feet per second for 24 hours; Col., Column; Cumul., Cumulative]

Controlled Releases from New York City Reservoirs					Controlled Releases from Power Reservoirs			Segregation of Flow, Delaware River at Montague, New Jersey					
Directed		Pepacton	Cannonsville	Neversink	Date	Lake Wallenpaupack	Rio Reservoir	Date	Controlled Releases			Computed uncontrolled	Total
									New York City Reservoirs		Powerplants		
Date	Amount								Directed	Other			
2006/2007	Col. 1	Col. 2	Col. 3	Col. 4	2006/2007	Col. 5	Col. 6	2007	Col. 7	Col. 8	Col. 9	Col. 10	Col. 11
Dec. 29	0	186	529	85	Dec. 31	305	163	Jan. 1	0	800	468	3,962	5,230
30	0	186	432	85	Jan. 1	238	291	2	0	703	529	6,008	7,240
31	0	186	834	96	2	282	181	3	0	1,116	463	5,381	6,960
Jan. 1	0	186	1,007	189	3	291	96	4	0	1,382	387	4,511	6,280
2	0	186	1,004	190	4	298	78	5	0	1,380	376	4,284	6,040
3	0	186	1,006	190	5	454	46	6	0	1,382	500	6,288	8,170
4	0	186	941	190	6	582	177	7	0	1,317	759	12,924	15,000
5	0	186	939	190	7	513	305	8	0	1,315	818	13,767	15,900
6	0	186	1,004	184	8	785	727	9	0	1,374	1,512	18,314	21,200
7	0	195	1,006	59	9	832	709	10	0	1,260	1,541	13,199	16,000
8	0	551	1,009	190	10	832	699	11	0	1,750	1,531	9,619	12,900
9	0	701	1,002	190	11	832	340	12	0	1,893	1,172	7,635	10,700
10	0	698	998	190	12	832	660	13	0	1,886	1,492	6,722	10,100
11	0	699	1,001	190	13	832	383	14	0	1,890	1,215	7,095	10,200
12	0	699	1,002	190	14	832	390	15	0	1,891	1,222	8,587	11,700
13	0	699	1,004	189	15	832	624	16	0	1,892	1,456	14,852	18,200
14	0	699	1,004	190	16	832	507	17	0	1,893	1,339	13,368	16,600
15	0	699	1,002	190	17	832	514	18	0	1,891	1,346	10,363	13,600
16	0	699	998	190	18	738	305	19	0	1,887	1,043	9,270	12,200
17	0	699	999	190	19	512	238	20	0	1,888	750	8,462	11,100
18	0	699	998	190	20	516	238	21	0	1,887	754	6,919	9,560
19	0	699	998	189	21	408	177	22	0	1,886	585	5,899	8,370
20	0	699	998	190	22	314	177	23	0	1,887	491	5,322	7,700
21	0	699	996	190	23	346	209	24	0	1,885	555	4,640	7,080
22	0	699	996	190	24	240	152	25	0	1,885	392	4,243	6,520
23	0	699	998	183	25	711	202	26	0	1,880	913	3,497	6,290
24	0	699	1,002	135	26	357	174	27	0	1,836	531	2,893	5,260
25	0	699	1,004	90	27	0	0	28	0	1,793	0	3,027	4,820
26	0	698	1,004	85	28	98	0	29	0	1,787	98	3,325	5,210
27	0	699	1,002	85	29	300	0	30	0	1,786	300	3,044	5,130
28	0	699	1,004	85	30	361	177	31	0	1,788	538	2,844	5,170
Total	0	16,400	29,721	4,969		16,137	8,939		0	51,090	25,076	230,264	306,430

Col. 2 - 24 hours beginning 1200 of date shown.
Col. 3 - 24 hours ending 2400 one day later.
Col. 4 - 24 hours beginning 1500 one day later.
Col. 5 - 24 hours beginning 0800 of date shown.
Col. 6 - 24 hours beginning 1600 of date shown.

Col. 7 = Col. 2 + Col. 3 + Col. 4 in response to direction (Col. 1).
Col. 8 = Col. 2 + Col. 3 + Col. 4 - Col. 7.
Col. 9 = Col. 5 + Col. 6.
Col. 10 = Col. 11 - Col. 7 - Col. 8 - Col. 9.
Col. 11 = 24 hours of calendar day shown.

Table 9. Controlled releases from reservoirs in the upper Delaware River Basin and segregation of flow of Delaware River at Montague, New Jersey.—Continued
(River Master daily operation record)

[Mean discharge in cubic feet per second for 24 hours; Col., Column; Cumul., Cumulative]

Controlled Releases from New York City Reservoirs					Controlled Releases from Power Reservoirs			Segregation of Flow, Delaware River at Montague, New Jersey					
Directed		Pepacton	Cannonsville	Neversink	Date	Lake Wallenpaupack	Rio Reservoir	Date	Controlled Releases			Computed uncontrolled	Total
									New York City Reservoirs		Powerplants		
Date	Amount								Directed	Other			
2007	Col. 1	Col. 2	Col. 3	Col. 4	2007	Col. 5	Col. 6	2007	Col. 7	Col. 8	Col. 9	Col. 10	Col. 11
Jan. 29	0	699	999	85	Jan. 31	249	181	Feb. 1	0	1,783	430	2,787	5,000
30	0	699	1,001	85	Feb. 1	250	191	2	0	1,785	441	2,534	4,760
31	0	699	998	85	2	452	167	3	0	1,782	619	2,299	4,700
Feb. 1	0	699	998	85	3	0	0	4	0	1,782	0	2,118	3,900
2	0	699	996	85	4	36	0	5	0	1,780	36	1,584	3,400
3	0	699	995	85	5	382	0	6	0	1,779	382	1,339	3,500
4	0	688	920	85	6	257	0	7	0	1,693	257	1,450	3,400
5	0	651	899	85	7	378	0	8	0	1,635	378	1,587	3,600
6	0	647	1,002	85	8	446	0	9	0	1,734	446	1,920	4,100
7	0	682	925	85	9	258	0	10	0	1,692	258	1,850	3,800
8	0	538	674	85	10	0	0	11	0	1,297	0	1,503	2,800
9	0	384	449	85	11	36	0	12	0	918	36	1,646	2,600
10	0	248	274	85	12	356	0	13	0	607	356	1,637	2,600
11	0	186	249	85	13	445	0	14	0	520	445	1,635	2,600
12	0	186	249	85	14	484	0	15	0	520	484	1,596	2,600
13	0	186	254	85	15	427	0	16	0	525	427	1,548	2,500
14	0	186	254	85	16	338	0	17	0	525	338	1,537	2,400
15	0	196	258	85	17	0	0	18	0	539	0	1,561	2,100
16	0	309	619	85	18	95	0	19	0	1,013	95	1,592	2,700
17	0	303	1,006	85	19	372	0	20	0	1,394	372	1,634	3,400
18	0	210	1,006	85	20	445	0	21	0	1,301	445	1,954	3,700
19	0	186	1,002	85	21	408	0	22	0	1,273	408	1,819	3,500
20	0	186	1,001	85	22	472	0	23	0	1,272	472	1,756	3,500
21	0	186	996	85	23	398	0	24	0	1,267	398	1,735	3,400
22	0	186	998	85	24	0	0	25	0	1,269	0	1,731	3,000
23	0	186	1,001	85	25	51	0	26	0	1,272	51	1,777	3,100
24	0	186	998	85	26	688	0	27	0	1,269	688	1,943	3,900
25	0	186	908	85	27	749	0	28	0	1,179	749	1,972	3,900
Total	0	11,096	21,929	2,380		8,472	539		0	35,405	9,011	50,044	94,460

Col. 2 - 24 hours beginning 1200 of date shown.
Col. 3 - 24 hours ending 2400 one day later.
Col. 4 - 24 hours beginning 1500 one day later.
Col. 5 - 24 hours beginning 0800 of date shown.
Col. 6 - 24 hours beginning 1600 of date shown.

Col. 7 = Col. 2 + Col. 3 + Col. 4 in response to direction (Col. 1).
Col. 8 = Col. 2 + Col. 3 + Col. 4 - Col. 7.
Col. 9 = Col. 5 + Col. 6.
Col. 10 = Col. 11 - Col. 7 - Col. 8 - Col. 9.
Col. 11 = 24 hours of calendar day shown.

Table 9. Controlled releases from reservoirs in the upper Delaware River Basin and segregation of flow of Delaware River at Montague, New Jersey.—Continued
(River Master daily operation record)

[Mean discharge in cubic feet per second for 24 hours; Col., Column; Cumul., Cumulative]

Controlled Releases from New York City Reservoirs					Controlled Releases from Power Reservoirs			Segregation of Flow, Delaware River at Montague, New Jersey					
Directed		Pepacton	Cannonsville	Neversink	Date	Lake Wallenpaupack	Rio Reservoir	Date	Controlled Releases		Powerplants	Computed uncontrolled	Total
									New York City Reservoirs				
Date	Amount								Directed	Other			
2007	Col. 1	Col. 2	Col. 3	Col. 4	2007	Col. 5	Col. 6	2007	Col. 7	Col. 8	Col. 9	Col. 10	Col. 11
Feb. 26	0	186	671	85	Feb. 28	1,351	0	Mar. 1	0	942	1,351	2,107	4,400
27	0	186	473	85	Mar. 1	1,689	0	2	0	744	1,689	5,067	7,500
28	0	186	449	85	2	1,295	0	3	0	720	1,295	5,485	7,500
Mar. 1	0	186	449	85	3	668	0	4	0	720	668	5,412	6,800
2	0	186	447	85	4	382	0	5	0	718	382	5,100	6,200
3	0	186	447	85	5	303	0	6	0	718	303	3,579	4,600
4	0	186	447	85	6	544	0	7	0	718	544	2,638	3,900
5	0	186	545	85	7	367	0	8	0	816	367	2,417	3,600
6	0	186	928	85	8	268	0	9	0	1,199	268	2,633	4,100
7	0	186	993	85	9	215	0	10	0	1,264	215	2,421	3,900
8	0	186	939	85	10	0	0	11	0	1,210	0	2,490	3,700
9	0	186	756	80	11	23	0	12	0	1,022	23	3,055	4,100
10	0	178	493	85	12	179	0	13	0	756	179	3,665	4,600
11	0	186	282	99	13	175	0	14	0	567	175	5,058	5,800
12	0	186	255	79	14	206	78	15	0	520	284	14,496	15,300
13	0	186	255	80	15	185	305	16	0	521	490	25,089	26,100
14	0	184	209	65	16	243	571	17	0	458	814	14,828	16,100
15	0	101	183	65	17	0	759	18	0	349	759	11,692	12,800
16	0	181	702	65	18	4	759	19	0	948	763	8,889	10,600
17	0	186	1,002	65	19	199	748	20	0	1,253	947	7,070	9,270
18	0	193	1,004	65	20	264	138	21	0	1,262	402	6,476	8,140
19	0	565	1,002	164	21	774	78	22	0	1,731	852	5,817	8,400
20	0	699	1,001	190	22	834	312	23	0	1,890	1,146	10,864	13,900
21	0	699	996	190	23	832	248	24	0	1,885	1,080	15,135	18,100
22	0	699	999	189	24	549	255	25	0	1,887	804	18,009	20,700
23	0	699	1,006	190	25	229	447	26	0	1,895	676	21,829	24,400
24	0	699	927	189	26	349	766	27	0	1,815	1,115	23,470	26,400
25	0	699	235	190	27	469	766	28	0	1,124	1,235	31,641	34,000
26	0	699	79	176	28	611	759	29	0	954	1,370	28,276	30,600
27	0	699	45	102	29	786	770	30	0	846	1,556	22,198	24,600
28	0	492	43	183	30	780	770	31	0	718	1,550	18,132	20,400
Total	0	10,462	18,262	3,446		14,773	8,529		0	32,170	23,302	335,038	390,510

Col. 2 - 24 hours beginning 1200 of date shown.
Col. 3 - 24 hours ending 2400 one day later.
Col. 4 - 24 hours beginning 1500 one day later.
Col. 5 - 24 hours beginning 0800 of date shown.
Col. 6 - 24 hours beginning 1600 of date shown.

Col. 7 = Col. 2 + Col. 3 + Col. 4 in response to direction (Col. 1).
Col. 8 = Col. 2 + Col. 3 + Col. 4 - Col. 7.
Col. 9 = Col. 5 + Col. 6.
Col. 10 = Col. 11 - Col. 7 - Col. 8 - Col. 9.
Col. 11 = 24 hours of calendar day shown.

Table 9. Controlled releases from reservoirs in the upper Delaware River Basin and segregation of flow of Delaware River at Montague, New Jersey.—Continued
(River Master daily operation record)

[Mean discharge in cubic feet per second for 24 hours; Col., Column; Cumul., Cumulative]

Controlled Releases from New York City Reservoirs					Controlled Releases from Power Reservoirs			Segregation of Flow, Delaware River at Montague, New Jersey					
Directed		Pepacton	Cannonsville	Neversink	Date	Lake Wallenpaupack	Rio Reservoir	Date	Controlled Releases		Powerplants	Computed uncontrolled	Total
									New York City Reservoirs				
Date	Amount								Directed	Other			
2007	Col. 1	Col. 2	Col. 3	Col. 4	2007	Col. 5	Col. 6	2007	Col. 7	Col. 8	Col. 9	Col. 10	Col. 11
Mar. 29	0	43	46	183	Mar. 31	642	770	Apr. 1	0	272	1,412	16,116	17,800
30	0	70	656	179	Apr. 1	720	770	2	0	905	1,490	14,505	16,900
31	0	475	982	170	2	827	770	3	0	1,627	1,597	12,176	15,400
Apr. 1	0	699	990	3	3	827	770	4	0	1,692	1,597	10,911	14,200
2	0	699	1,001	152	4	1,694	755	5	0	1,852	2,449	12,299	16,600
3	0	699	999	121	5	1,599	762	6	0	1,819	2,361	10,620	14,800
4	0	699	999	158	6	1,254	762	7	0	1,856	2,016	8,528	12,400
5	0	699	1,001	183	7	742	762	8	0	1,883	1,504	7,313	10,700
6	0	699	1,001	189	8	571	709	9	0	1,889	1,280	6,431	9,600
7	0	699	999	189	9	697	408	10	0	1,887	1,105	5,558	8,550
8	0	699	999	156	10	507	504	11	0	1,854	1,011	4,885	7,750
9	0	699	998	0	11	492	369	12	0	1,697	861	5,032	7,590
10	0	699	999	0	12	528	734	13	0	1,698	1,262	6,640	9,600
11	0	699	998	0	13	554	702	14	0	1,697	1,256	6,097	9,050
12	0	699	999	162	14	0	170	15	0	1,860	170	8,470	10,500
13	0	699	1,002	190	15	1,447	752	16	0	1,891	2,199	52,710	56,800
14	0	699	1,002	110	16	1,722	766	17	0	1,811	2,488	49,201	53,500
15	0	591	1,007	26	17	1,724	766	18	0	1,624	2,490	34,286	38,400
16	0	36	718	172	18	1,724	766	19	0	926	2,490	28,084	31,500
17	0	36	51	190	19	1,724	766	20	0	277	2,490	25,433	28,200
18	0	36	45	190	20	648	762	21	0	271	1,410	22,019	23,700
19	0	36	45	190	21	0	759	22	0	271	759	19,170	20,200
20	0	36	45	190	22	603	755	23	0	271	1,358	16,671	18,300
21	0	36	97	190	23	1,724	713	24	0	323	2,437	13,740	16,500
22	0	36	585	150	24	1,151	383	25	0	771	1,534	11,095	13,400
23	0	110	795	150	25	392	493	26	0	1,055	885	10,760	12,700
24	0	376	1,001	170	26	427	362	27	0	1,547	789	9,564	11,900
25	0	692	1,001	166	27	317	532	28	0	1,859	849	7,992	10,700
26	0	699	1,001	190	28	0	748	29	0	1,890	748	6,942	9,580
27	0	699	999	186	29	64	741	30	0	1,884	805	6,361	9,050
Total	0	13,793	23,061	4,305		25,321	19,781		0	41,159	45,102	449,609	535,870

Col. 2 - 24 hours beginning 1200 of date shown.
Col. 3 - 24 hours ending 2400 one day later.
Col. 4 - 24 hours beginning 1500 one day later.
Col. 5 - 24 hours beginning 0800 of date shown.
Col. 6 - 24 hours beginning 1600 of date shown.

Col. 7 = Col. 2 + Col. 3 + Col. 4 in response to direction (Col. 1).
Col. 8 = Col. 2 + Col. 3 + Col. 4 - Col. 7.
Col. 9 = Col. 5 + Col. 6.
Col. 10 = Col. 11 - Col. 7 - Col. 8 - Col. 9.
Col. 11 = 24 hours of calendar day shown.

Table 9. Controlled releases from reservoirs in the upper Delaware River Basin and segregation of flow of Delaware River at Montague, New Jersey.—Continued
(River Master daily operation record)

[Mean discharge in cubic feet per second for 24 hours; Col., Column; Cumul., Cumulative]

Controlled Releases from New York City Reservoirs					Controlled Releases from Power Reservoirs			Segregation of Flow, Delaware River at Montague, New Jersey					
Directed		Pepacton	Cannonsville	Neversink	Date	Lake Wallenpaupack	Rio Reservoir	Date	Controlled Releases			Computed uncontrolled	Total
									New York City Reservoirs		Powerplants		
Date	Amount								Directed	Other			
2007	Col. 1	Col. 2	Col. 3	Col. 4	2007	Col. 5	Col. 6	2007	Col. 7	Col. 8	Col. 9	Col. 10	Col. 11
Apr. 28	0	699	998	88	Apr. 30	512	738	May 1	0	1,785	1,250	5,585	8,620
29	0	699	998	65	May 1	661	727	2	0	1,762	1,388	4,610	7,760
30	0	699	996	67	2	360	716	3	0	1,762	1,076	4,422	7,260
May 1	0	699	907	74	3	371	262	4	0	1,680	633	3,717	6,030
2	0	504	659	74	4	240	305	5	0	1,237	545	3,268	5,050
3	0	215	393	74	5	0	309	6	0	682	309	3,339	4,330
4	0	102	198	74	6	0	316	7	0	374	316	3,130	3,820
5	0	101	142	74	7	237	14	8	0	317	251	3,022	3,590
6	0	101	142	74	8	247	14	9	0	317	261	2,702	3,280
7	0	101	131	74	9	230	99	10	0	306	329	2,535	3,170
8	0	101	121	88	10	253	234	11	0	310	487	2,813	3,610
9	0	113	131	90	11	153	174	12	0	334	327	3,759	4,420
10	0	116	121	90	12	0	113	13	0	327	113	3,490	3,930
11	0	116	116	90	13	0	50	14	0	322	50	3,028	3,400
12	0	116	108	90	14	0	255	15	0	314	255	2,661	3,230
13	0	116	108	90	15	0	319	16	0	314	319	2,467	3,100
14	0	116	114	90	16	0	369	17	0	320	369	2,481	3,170
15	0	128	122	90	17	79	333	18	0	340	412	2,698	3,450
16	0	118	107	90	18	0	78	19	0	315	78	2,427	2,820
17	0	116	114	107	19	0	0	20	0	337	0	2,303	2,640
18	0	116	136	108	20	0	0	21	0	360	0	2,240	2,600
19	0	116	145	102	21	0	14	22	0	363	14	2,163	2,540
20	0	111	142	114	22	0	46	23	0	367	46	1,977	2,390
21	0	121	152	116	23	0	113	24	0	389	113	1,878	2,380
22	0	124	155	116	24	0	160	25	0	395	160	1,755	2,310
23	0	124	190	116	25	228	96	26	0	430	324	1,606	2,360
24	265	136	255	116	26	0	0	27	265	242	0	1,563	2,070
25	442	139	227	116	27	0	0	28	442	40	0	1,548	2,030
26	219	139	192	116	28	0	177	29	219	228	177	1,576	2,200
27	329	139	186	116	29	0	0	30	329	112	0	1,599	2,040
28	275	139	203	131	30	0	0	31	275	198	0	1,367	1,840
Total	1,530	6,480	8,709	2,920		3,571	6,031		1,530	16,579	9,602	83,729	111,440

Col. 2 - 24 hours beginning 1200 of date shown.
Col. 3 - 24 hours ending 2400 one day later.
Col. 4 - 24 hours beginning 1500 one day later.
Col. 5 - 24 hours beginning 0800 of date shown.
Col. 6 - 24 hours beginning 1600 of date shown.

Col. 7 = Col. 2 + Col. 3 + Col. 4 in response to direction (Col. 1).
Col. 8 = Col. 2 + Col. 3 + Col. 4 - Col. 7.
Col. 9 = Col. 5 + Col. 6.
Col. 10 = Col. 11 - Col. 7 - Col. 8 - Col. 9.
Col. 11 = 24 hours of calendar day shown.

Table 9. Controlled releases from reservoirs in the upper Delaware River Basin and segregation of flow of Delaware River at Montague, New Jersey.—Continued
(River Master daily operation record)

[Mean discharge in cubic feet per second for 24 hours; Col., Column; Cumul., Cumulative]

Controlled Releases from New York City Reservoirs					Controlled Releases from Power Reservoirs			Segregation of Flow, Delaware River at Montague, New Jersey							
Directed		Pepac-ton	Cannons-ville	Never-sink	Date	Lake Wallenpau-pack	Rio Reservoir	Date	Controlled Releases			Computed uncon-trolled	Total	Excess Release Credits	
									New York City Reservoirs		Power-plants				
Date	Amount								Directed	Other				Daily	Cumul.
2007	Col. 1	Col. 2	Col. 3	Col. 4	2007	Col. 5	Col. 6	2007	Col. 7	Col. 8	Col. 9	Col. 10	Col. 11	Col. 12	Col. 13
May 29	450	139	223	116	May 31	0	0	June 1	450	28	0	1,292	1,770		
30	293	139	229	118	June 1	275	0	2	293	193	275	1,219	1,980		
31	678	141	424	130	2	0	0	3	678	17	0	1,205	1,900		
June 1	649	139	368	133	3	4	14	4	640	0	18	1,702	2,360		
2	0	138	223	124	4	353	64	5	0	485	417	1,948	2,850		
3	0	93	159	124	5	424	0	6	0	376	424	1,650	2,450		
4	0	108	152	124	6	325	0	7	0	384	325	1,521	2,230		
5	0	110	164	110	7	392	0	8	0	384	392	1,294	2,070		
6	238	136	291	116	8	239	0	9	238	305	239	1,128	1,910		
7	612	145	455	116	9	0	0	10	612	104	0	1,134	1,850		
8	681	147	415	116	10	0	0	11	678	0	0	1,152	1,830		
9	360	147	364	116	11	317	0	12	360	267	317	1,116	2,060		
10	412	145	365	116	12	375	0	13	412	214	375	1,089	2,090		
11	293	145	404	118	13	322	0	14	293	374	322	1,061	2,050		
12	579	147	316	124	14	302	0	15	579	8	302	1,021	1,910	152	152
13	766	145	489	124	15	102	0	16	758	0	102	890	1,750	0	152
14	998	147	724	127	16	0	0	17	998	0	0	962	1,960	210	362
15	955	145	668	145	17	0	0	18	958	0	0	852	1,810	60	422
16	682	153	381	147	18	285	0	19	681	0	285	834	1,800	50	472
17	572	155	514	147	19	282	0	20	572	244	282	1,022	2,120	126	598
18	862	155	617	142	20	0	0	21	862	52	0	3,236	4,150	862	1,460
19	688	156	410	122	21	0	0	22	688	0	0	2,142	2,830	688	2,148
20	0	94	224	122	22	0	0	23	0	440	0	1,640	2,080	50	2,198
21	422	105	204	124	23	0	0	24	422	11	0	1,317	1,750	0	2,198
22	654	325	204	130	24	59	0	25	654	5	59	1,022	1,740	-10	2,188
23	0	155	232	127	25	673	0	26	0	514	673	1,023	2,210	50	2,238
24	506	147	538	131	26	288	0	27	506	310	288	906	2,010	50	2,288
25	551	147	611	145	27	213	0	28	551	352	213	1,084	2,200	98	2,386
26	906	152	634	147	28	372	0	29	906	27	372	1,235	2,540	763	3,149
27	919	155	634	131	29	0	0	30	920	0	0	1,080	2,000	250	3,399
Total	14,726	4,355	11,636	3,812		5,602	78		14,709	5,094	5,680	38,777	64,260		

Col. 2 - 24 hours beginning 1200 of date shown.
Col. 3 - 24 hours ending 2400 one day later.
Col. 4 - 24 hours beginning 1500 one day later.
Col. 5 - 24 hours beginning 0800 of date shown.
Col. 6 - 24 hours beginning 1600 of date shown.

Col. 7 = Col. 2 + Col. 3 + Col. 4 in response to direction (Col. 1).
Col. 8 = Col. 2 + Col. 3 + Col. 4 - Col. 7.
Col. 9 = Col. 5 + Col. 6.
Col. 10 = Col. 11 - Col. 7 - Col. 8 - Col. 9.
Col. 11 = 24 hours of calendar day shown.

Col. 12 = Col. 11 - Col. 8 - 1,750 ft^3/s computed arithmetically, but not greater than Col. 7; except that part of Col. 8 contributing to the excess-release increment of Col. 11.
Col. 13 = Season limit of cumulative credit beginning June 15, 2007 = 11,418 $(ft^3/s)\cdot d$. A total of 5,718 $(ft^3/s)\cdot d$ is available for release.

Table 9. Controlled releases from reservoirs in the upper Delaware River Basin and segregation of flow of Delaware River at Montague, New Jersey.—Continued
(River Master daily operation record)

[Mean discharge in cubic feet per second for 24 hours; Col., Column; Cumul., Cumulative]

Controlled Releases from New York City Reservoirs					Controlled Releases from Power Reservoirs			Segregation of Flow, Delaware River at Montague, New Jersey							
Directed		Pepacton	Cannonsville	Neversink	Date	Lake Wallenpaupack	Rio Reservoir	Date	Controlled Releases			Computed uncontrolled	Total	Excess Release Credits	
									New York City Reservoirs		Powerplants				
Date	Amount								Directed	Other				Daily	Cumul.
2007	Col. 1	Col. 2	Col. 3	Col. 4	2007	Col. 5	Col. 6	2007	Col. 7	Col. 8	Col. 9	Col. 10	Col. 11	Col. 12	Col. 13
June 28	753	226	390	131	June 30	0	0	July 1	747	0	0	953	1,700	-50	3,349
29	936	500	311	131	July 1	0	0	2	936	6	0	778	1,780	-30	3,319
30	945	582	234	131	2	6	0	3	945	2	6	727	1,680	-70	3,249
July 1	995	630	234	131	3	0	0	4	995	0	0	665	1,660	-90	3,159
2	613	272	209	130	4	298	0	5	611	0	298	881	1,790	40	3,199
3	572	237	207	113	5	429	0	6	557	0	429	1,524	2,510	557	3,756
4	0	138	176	131	6	583	0	7	0	445	583	1,792	2,820	0	3,756
5	597	278	189	131	7	373	0	8	598	0	373	1,249	2,220	470	4,226
6	603	187	357	131	8	355	89	9	603	72	444	921	2,040	218	4,444
7	325	186	455	131	9	451	152	10	325	447	603	835	2,210	50	4,494
8	421	186	495	155	10	481	113	11	421	415	594	770	2,200	50	4,544
9	346	184	582	152	11	434	0	12	346	572	434	918	2,270	50	4,594
10	0	186	543	131	12	410	0	13	0	860	410	820	2,090	50	4,644
11	166	164	483	124	13	482	0	14	166	605	482	757	2,010	50	4,694
12	863	398	350	139	14	33	0	15	863	24	33	690	1,610	-140	4,554
13	926	416	396	139	15	4	0	16	926	25	4	705	1,660	-90	4,464
14	530	200	429	138	16	410	0	17	530	237	410	653	1,830	50	4,514
15	484	155	418	130	17	576	0	18	484	219	576	681	1,960	50	4,564
16	576	156	404	124	18	401	0	19	576	108	401	735	1,820	50	4,614
17	393	156	385	116	19	388	0	20	393	264	388	815	1,860	50	4,664
18	0	156	283	116	20	532	0	21	0	555	532	843	1,930	50	4,714
19	0	156	232	124	21	0	0	22	0	512	0	748	1,260	-490	4,224
20	1,002	353	526	124	22	0	0	23	1,003	0	0	697	1,700	-50	4,174
21	575	159	295	124	23	383	0	24	578	0	383	2,089	3,050	578	4,752
22	0	155	215	124	24	432	0	25	0	494	432	2,194	3,120	0	4,752
23	0	155	215	124	25	577	0	26	0	494	577	1,649	2,720	0	4,752
24	0	155	243	139	26	653	0	27	0	537	653	1,140	2,330	7	4,759
25	0	155	339	139	27	542	0	28	0	633	542	2,215	3,390	0	4,759
26	225	155	399	136	28	1,211	0	29	225	465	1,211	2,489	4,390	225	4,984
27	0	153	374	114	29	1,156	0	30	0	641	1,156	2,003	3,800	0	4,984
28	0	149	381	99	30	987	0	31	0	629	987	1,574	3,190	0	4,984
Total	12,846	7,338	10,749	4,002		12,587	354		12,828	9,261	12,941	35,510	70,540		

Col. 2 - 24 hours beginning 1200 of date shown.
Col. 3 - 24 hours ending 2400 one day later.
Col. 4 - 24 hours beginning 1500 one day later.
Col. 5 - 24 hours beginning 0800 of date shown.
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Col. 7 = Col. 2 + Col. 3 + Col. 4 in response to direction (Col. 1).
Col. 8 = Col. 2 + Col. 3 + Col. 4 - Col. 7.
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Col. 11 = 24 hours of calendar day shown.

Col. 12 = Col. 11 - Col. 8 - 1,750 ft^3/s computed arithmetically, but not greater than Col. 7; except that part of Col. 8 contributing to the excess-release increment of Col. 11.
Col. 13 = Season limit of cumulative credit beginning June 15, 2007 = 11,418 $(ft^3/s)\cdot d$. A total of 5,718 $(ft^3/s)\cdot d$ is available for release.

Table 9. Controlled releases from reservoirs in the upper Delaware River Basin and segregation of flow of Delaware River at Montague, New Jersey.—Continued
(River Master daily operation record)

[Mean discharge in cubic feet per second for 24 hours; Col., Column; Cumul., Cumulative]

Controlled Releases from New York City Reservoirs					Controlled Releases from Power Reservoirs			Segregation of Flow, Delaware River at Montague, New Jersey							
Directed		Pepac-ton	Cannons-ville	Never-sink	Date	Lake Wallenpau-pack	Rio Reservoir	Date	Controlled Releases			Computed uncon-trolled	Total	Excess Release Credits	
									New York City Reservoirs		Power-plants				
Date	Amount								Directed	Other				Daily	Cumul.
2007	Col. 1	Col. 2	Col. 3	Col. 4	2007	Col. 5	Col. 6	2007	Col. 7	Col. 8	Col. 9	Col. 10	Col. 11	Col. 12	Col. 13
July 29	0	164	444	93	July 31	616	0	Aug. 1	0	701	616	1,513	2,830	0	4,984
30	0	187	463	110	Aug. 1	318	0	2	0	760	318	1,162	2,240	50	5,034
31	346	167	464	128	2	276	0	3	346	413	276	1,015	2,050	50	5,084
Aug. 1	308	149	461	145	3	380	0	4	308	447	380	1,245	2,380	183	5,267
2	943	170	620	155	4	23	0	5	943	2	23	1,112	2,080	328	5,595
3	1,059	193	701	170	5	0	0	6	1,059	5	0	896	1,960	123	5,718
4	731	155	475	155	6	323	0	7	731	54	323	882	1,990		
5	666	155	442	170	7	327	0	8	666	101	327	1,176	2,270		
6	706	155	456	145	8	351	0	9	706	50	351	1,773	2,880		
7	625	153	379	93	9	293	0	10	625	0	293	2,502	3,420		
8	68	173	305	91	10	435	0	11	68	501	435	3,406	4,410		
9	523	176	277	70	11	0	0	12	523	0	0	2,957	3,480		
10	438	125	249	96	12	0	0	13	438	32	0	2,230	2,700		
11	0	131	328	124	13	484	0	14	0	583	484	1,733	2,800		
12	0	152	368	124	14	434	0	15	0	644	434	1,422	2,500		
13	83	155	370	116	15	555	18	16	83	558	573	1,276	2,490		
14	306	130	370	111	16	633	195	17	306	305	828	1,091	2,530		
15	491	130	342	108	17	325	0	18	491	89	325	1,115	2,020		
16	921	145	656	116	18	7	0	19	917	0	7	1,116	2,040		
17	799	145	537	116	19	0	0	20	798	0	0	1,032	1,830		
18	632	147	373	116	20	268	0	21	632	4	268	1,236	2,140		
19	713	145	450	116	21	608	0	22	711	0	608	1,621	2,940		
20	578	139	333	108	22	476	0	23	578	2	476	1,604	2,660		
21	269	139	210	108	23	560	0	24	269	188	560	1,483	2,500		
22	166	139	200	108	24	619	0	25	166	281	619	1,304	2,370		
23	726	170	435	125	25	393	0	26	726	4	393	1,087	2,210		
24	447	156	464	139	26	410	0	27	447	312	410	1,071	2,240		
25	381	167	453	119	27	417	0	28	381	358	417	974	2,130		
26	458	155	410	116	28	295	0	29	458	223	295	914	1,890		
27	604	147	418	116	29	336	0	30	604	77	336	843	1,860		
28	678	147	421	116	30	303	0	31	678	6	303	793	1,780		
Total	14,665	4,761	12,874	3,723		10,465	213		14,658	6,700	10,678	43,584	75,620		

Col. 2 - 24 hours beginning 1200 of date shown.
Col. 3 - 24 hours ending 2400 one day later.
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Col. 6 - 24 hours beginning 1600 of date shown.

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Table 9. Controlled releases from reservoirs in the upper Delaware River Basin and segregation of flow of Delaware River at Montague, New Jersey.—Continued
(River Master daily operation record)

[Mean discharge in cubic feet per second for 24 hours; Col., Column; Cumul., Cumulative]

Controlled Releases from New York City Reservoirs					Controlled Releases from Power Reservoirs			Segregation of Flow, Delaware River at Montague, New Jersey					
Directed		Pepacton	Cannonsville	Neversink	Date	Lake Wallenpaupack	Rio Reservoir	Date	Controlled Releases			Computed uncontrolled	Total
									New York City Reservoirs		Powerplants		
Date	Amount								Directed	Other			
2007	Col. 1	Col. 2	Col. 3	Col. 4	2007	Col. 5	Col. 6	2007	Col. 7	Col. 8	Col. 9	Col. 10	Col. 11
Aug. 29	772	147	511	116	Aug. 31	426	0	Sept. 1	772	2	426	730	1,930
30	1,220	155	936	124	Sept. 1	0	0	2	1,215	0	0	635	1,850
31	1,168	155	885	124	2	0	0	3	1,164	0	0	646	1,810
Sept. 1	1,157	155	877	124	3	0	0	4	1,156	0	0	624	1,780
2	814	155	524	130	4	404	0	5	809	0	404	687	1,900
3	821	155	537	131	5	350	0	6	821	2	350	607	1,780
4	876	155	588	131	6	417	35	7	874	0	452	564	1,890
5	905	170	603	131	7	393	71	8	904	0	464	582	1,950
6	965	170	661	131	8	423	0	9	962	0	423	745	2,130
7	1,070	178	753	131	9	0	0	10	1,062	0	0	598	1,660
8	681	178	374	131	10	564	0	11	681	2	564	833	2,080
9	700	178	387	130	11	345	0	12	695	0	345	870	1,910
10	705	178	398	131	12	303	0	13	705	2	303	1,430	2,440
11	654	178	353	131	13	516	0	14	654	8	516	1,152	2,330
12	332	139	204	124	14	315	0	15	332	135	315	988	1,770
13	886	124	637	124	15	0	0	16	885	0	0	885	1,770
14	1,007	124	763	124	16	0	0	17	1,007	4	0	1,049	2,060
15	590	124	345	124	17	313	0	18	590	3	313	974	1,880
16	610	124	362	124	18	192	0	19	610	0	192	858	1,660
17	636	124	387	124	19	337	0	20	635	0	337	728	1,700
18	668	108	432	124	20	267	0	21	664	0	267	719	1,650
19	728	124	480	124	21	271	0	22	728	0	271	661	1,660
20	859	124	611	124	22	273	0	23	859	0	273	618	1,750
21	1,152	139	883	124	23	0	0	24	1,146	0	0	614	1,760
22	788	139	528	124	24	323	0	25	788	3	323	636	1,750
23	820	155	541	124	25	327	0	26	820	0	327	563	1,710
24	822	155	535	131	26	484	0	27	821	0	484	605	1,910
25	1,189	162	900	131	27	0	0	28	1,189	4	0	507	1,700
26	1,042	162	747	131	28	0	0	29	1,040	0	0	620	1,660
27	1,065	162	774	131	29	0	0	30	1,065	2	0	783	1,850
Total	25,702	4,496	17,516	3,808		7,243	106		25,653	167	7,349	22,511	55,680

Col. 2 - 24 hours beginning 1200 of date shown.
Col. 3 - 24 hours ending 2400 one day later.
Col. 4 - 24 hours beginning 1500 one day later.
Col. 5 - 24 hours beginning 0800 of date shown.
Col. 6 - 24 hours beginning 1600 of date shown.

Col. 7 = Col. 2 + Col. 3 + Col. 4 in response to direction (Col. 1).
Col. 8 = Col. 2 + Col. 3 + Col. 4 - Col. 7.
Col. 9 = Col. 5 + Col. 6.
Col. 10 = Col. 11 - Col. 7 - Col. 8 - Col. 9.
Col. 11 = 24 hours of calendar day shown.

Table 9. Controlled releases from reservoirs in the upper Delaware River Basin and segregation of flow of Delaware River at Montague, New Jersey.—Continued
(River Master daily operation record)

[Mean discharge in cubic feet per second for 24 hours; Col., Column; Cumul., Cumulative]

Controlled Releases from New York City Reservoirs					Controlled Releases from Power Reservoirs			Segregation of Flow, Delaware River at Montague, New Jersey					
Directed		Pepacton	Cannons-ville	Never-sink	Date	Lake Wallenpaupack	Rio Reservoir	Date	Controlled Releases			Computed uncon-trolled	Total
									New York City Res-ervoirs		Power-plants		
Date	Amount								Directed	Other			
2007	Col. 1	Col. 2	Col. 3	Col. 4	2007	Col. 5	Col. 6	2007	Col. 7	Col. 8	Col. 9	Col. 10	Col. 11
Sept. 28	1,190	162	891	131	Sept. 30	0	0	Oct. 1	1,184	0	0	636	1,820
29	1,197	162	888	131	Oct. 1	0	0	2	1,181	0	0	609	1,790
30	1,208	114	1,027	70	2	0	0	3	1,211	0	0	569	1,780
Oct. 1	1,230	85	1,072	70	3	0	0	4	1,227	0	0	533	1,760
2	1,252	85	1,095	70	4	0	0	5	1,250	0	0	510	1,760
3	1,258	85	1,100	70	5	0	0	6	1,255	0	0	515	1,770
4	1,289	85	1,228	70	6	0	0	7	1,383	0	0	477	1,860
5	1,294	85	1,239	70	7	0	0	8	1,394	0	0	496	1,890
6	1,305	85	1,244	70	8	0	0	9	1,399	0	0	541	1,940
7	1,219	85	1,165	70	9	0	0	10	1,320	0	0	990	2,310
8	927	85	874	70	10	0	0	11	1,029	0	0	1,701	2,730
9	765	84	611	70	11	196	0	12	765	0	196	4,019	4,980
10	403	84	249	70	12	0	0	13	403	0	0	4,807	5,210
11	0	62	87	45	13	0	0	14	0	194	0	3,156	3,350
12	0	62	80	45	14	0	0	15	0	187	0	2,353	2,540
13	0	62	80	45	15	0	0	16	0	187	0	1,933	2,120
14	0	62	80	45	16	0	0	17	0	187	0	1,643	1,830
15	108	60	82	45	17	0	0	18	108	79	0	1,423	1,610
16	304	60	203	45	18	9	0	19	308	0	9	1,233	1,550
17	0	60	84	45	19	0	0	20	0	189	0	2,151	2,340
18	0	60	80	45	20	0	0	21	0	185	0	3,265	3,450
19	445	59	339	45	21	0	0	22	443	0	0	2,847	3,290
20	0	60	90	45	22	0	0	23	0	195	0	2,275	2,470
21	0	60	80	45	23	0	0	24	0	185	0	2,045	2,230
22	0	60	80	45	24	0	0	25	0	185	0	2,825	3,010
23	0	60	82	45	25	0	0	26	0	187	0	3,323	3,510
24	0	60	80	45	26	0	0	27	0	185	0	4,455	4,640
25	0	60	80	45	27	0	0	28	0	185	0	16,315	16,500
26	0	60	80	45	28	0	0	29	0	185	0	11,415	11,600
27	0	60	80	45	29	291	0	30	0	185	291	7,394	7,870
28	0	60	82	45	30	300	0	31	0	187	300	5,653	6,140
Total	15,394	2,373	14,532	1,842		796	0		15,860	2,887	796	92,107	111,650

Col. 2 - 24 hours beginning 1200 of date shown.
Col. 3 - 24 hours ending 2400 one day later.
Col. 4 - 24 hours beginning 1500 one day later.
Col. 5 - 24 hours beginning 0800 of date shown.
Col. 6 - 24 hours beginning 1600 of date shown.

Col. 7 = Col. 2 + Col. 3 + Col. 4 in response to direction (Col. 1).
Col. 8 = Col. 2 + Col. 3 + Col. 4 - Col. 7.
Col. 9 = Col. 5 + Col. 6.
Col. 10 = Col. 11 - Col. 7 - Col. 8 - Col. 9.
Col. 11 = 24 hours of calendar day shown.

Table 9. Controlled releases from reservoirs in the upper Delaware River Basin and segregation of flow of Delaware River at Montague, New Jersey.—Continued
(River Master daily operation record)

[Mean discharge in cubic feet per second for 24 hours; Col., Column; Cumul., Cumulative]

Controlled Releases from New York City Reservoirs					Controlled Releases from Power Reservoirs			Segregation of Flow, Delaware River at Montague, New Jersey					
Directed		Pepacton	Cannonsville	Neversink	Date	Lake Wallenpaupack	Rio Reservoir	Date	Controlled Releases		Powerplants	Computed uncontrolled	Total
									New York City Reservoirs				
Date	Amount								Directed	Other			
2007	Col. 1	Col. 2	Col. 3	Col. 4	2007	Col. 5	Col. 6	2007	Col. 7	Col. 8	Col. 9	Col. 10	Col. 11
Oct. 29	0	62	80	45	Oct. 31	233	0	Nov. 1	0	187	233	4,670	5,090
30	0	60	80	45	Nov. 1	276	89	2	0	185	365	3,880	4,430
31	0	60	79	45	2	307	0	3	0	184	307	3,449	3,940
Nov. 1	0	60	80	45	3	0	0	4	0	185	0	3,065	3,250
2	0	60	80	46	4	15	0	5	0	186	15	2,799	3,000
3	0	63	84	45	5	249	0	6	0	192	249	2,639	3,080
4	0	60	80	45	6	301	18	7	0	185	319	2,816	3,320
5	0	60	80	45	7	252	89	8	0	185	341	3,094	3,620
6	0	60	80	45	8	233	177	9	0	185	410	2,595	3,190
7	0	60	80	45	9	259	89	10	0	185	348	2,427	2,960
8	0	60	82	45	10	0	0	11	0	187	0	2,443	2,630
9	0	60	82	45	11	0	0	12	0	187	0	2,403	2,590
10	0	60	82	45	12	312	160	13	0	187	472	2,321	2,980
11	0	60	82	45	13	367	230	14	0	187	597	3,086	3,870
12	0	60	80	45	14	297	230	15	0	185	527	6,408	7,120
13	0	60	79	45	15	291	762	16	0	184	1,053	18,563	19,800
14	0	60	79	45	16	227	851	17	0	184	1,078	12,438	13,700
15	0	60	80	45	17	135	851	18	0	185	986	8,489	9,660
16	0	60	82	45	18	154	408	19	0	187	562	6,861	7,610
17	0	62	80	45	19	399	426	20	0	187	825	6,138	7,150
18	0	60	80	45	20	553	496	21	0	185	1,049	7,496	8,730
19	0	60	80	45	21	638	603	22	0	185	1,241	7,054	8,480
20	0	62	82	45	22	280	408	23	0	189	688	6,183	7,060
21	0	62	82	48	23	312	426	24	0	192	738	5,310	6,240
22	0	63	99	60	24	338	426	25	0	222	764	4,644	5,630
23	0	85	110	60	25	388	532	26	0	255	920	5,385	6,560
24	0	85	110	60	26	863	727	27	0	255	1,590	11,055	12,900
25	0	85	110	60	27	1,085	745	28	0	255	1,830	13,315	15,400
26	0	85	111	60	28	1,189	567	29	0	256	1,756	9,588	11,600
27	0	85	110	60	29	1,039	390	30	0	255	1,429	7,706	9,390
Total	0	1,939	2,585	1,444		10,992	9,700		0	5,968	20,692	178,320	204,980

Col. 2 - 24 hours beginning 1200 of date shown.
Col. 3 - 24 hours ending 2400 one day later.
Col. 4 - 24 hours beginning 1500 one day later.
Col. 5 - 24 hours beginning 0800 of date shown.
Col. 6 - 24 hours beginning 1600 of date shown.

Col. 7 = Col. 2 + Col. 3 + Col. 4 in response to direction (Col. 1).
Col. 8 = Col. 2 + Col. 3 + Col. 4 - Col. 7.
Col. 9 = Col. 5 + Col. 6.
Col. 10 = Col. 11 - Col. 7 - Col. 8 - Col. 9.
Col. 11 = 24 hours of calendar day shown.

Table 10. Diversions to New York City water-supply system.
(River Master daily operation record)

[Million gallons per day for 24-hour period beginning 0800 local time]

Date 2006	East Delaware Tunnel	West Delaware Tunnel	Neversink Tunnel	Average June 1, 2006, to date	Date 2007	East Delaware Tunnel	West Delaware Tunnel	Neversink Tunnel	Average June 1, 2006, to date
Dec. 1	0	0	261	430	Jan. 1	448	0	0	436
2	0	0	261	429	2	329	0	74	436
3	0	0	261	428	3	303	0	108	436
4	5	0	261	428	4	303	0	102	436
5	300	0	261	428	5	301	0	109	436
6	300	0	261	429	6	302	0	0	435
7	301	0	261	430	7	301	0	0	434
8	300	0	261	430	8	2	0	321	434
9	299	0	260	431	9	0	0	326	433
10	299	0	260	432	10	0	0	349	433
11	299	0	76	431	11	196	0	347	434
12	488	0	0	432	12	70	0	346	433
13	488	0	0	432	13	0	0	346	433
14	488	0	0	432	14	0	0	345	433
15	488	0	0	433	15	0	0	345	432
16	488	0	0	433	16	0	0	345	432
17	487	0	0	433	17	2	0	345	432
18	487	0	0	433	18	0	0	345	431
19	463	0	107	434	19	166	0	226	431
20	455	0	137	435	20	205	0	194	431
21	455	0	26	435	21	204	0	193	431
22	454	0	0	435	22	213	0	229	431
23	454	0	0	435	23	372	76	59	431
24	454	0	0	435	24	399	122	49	432
25	454	0	0	435	25	364	99	91	432
26	454	0	0	435	26	353	100	100	433
27	454	0	0	436	27	308	0	100	433
28	454	0	40	436	28	353	197	102	433
29	454	0	0	436	29	351	142	104	434
30	453	0	0	436	30	349	134	106	435
31	453	0	0	436	31	329	146	3	435
Total	11,428	0	2,994			6,523	1,016	5,709	

Table 10. Diversions to New York City water-supply system.—Continued
(River Master daily operation record)

[Million gallons per day for 24-hour period beginning 0800 local time]

Date 2007	East Delaware Tunnel	West Delaware Tunnel	Neversink Tunnel	Average June 1, 2006, to date	Date 2007	East Delaware Tunnel	West Delaware Tunnel	Neversink Tunnel	Average June 1, 2006, to date
Feb. 1	436	137	152	436	Mar. 1	350	200	112	455
2	463	125	148	437	2	352	125	107	456
3	464	0	0	437	3	353	0	0	456
4	466	13	1	438	4	354	12	0	455
5	466	143	155	439	5	350	136	109	456
6	462	143	157	440	6	354	135	107	456
7	451	141	74	441	7	354	135	110	457
8	458	143	98	442	8	353	198	109	457
9	458	127	123	443	9	350	196	107	458
10	459	0	0	443	10	338	39	0	458
11	457	2	0	443	11	353	12	0	458
12	457	141	124	444	12	353	200	103	458
13	458	137	221	446	13	357	199	106	459
14	458	137	228	447	14	376	200	104	460
15	368	135	193	448	15	6	3	0	458
16	353	134	75	449	16	0	0	0	457
17	352	0	0	448	17	0	0	0	455
18	351	11	0	448	18	0	0	0	453
19	350	154	0	448	19	143	0	61	453
20	349	200	104	449	20	152	0	63	452
21	3	266	108	449	21	151	0	61	451
22	305	298	108	450	22	312	0	58	451
23	352	298	109	451	23	351	0	50	450
24	348	294	0	452	24	351	0	0	450
25	351	298	0	452	25	351	0	0	450
26	351	224	110	453	26	36	0	0	448
27	351	198	107	454	27	0	0	0	447
28	351	200	113	455	28	0	0	0	445
					29	0	0	0	444
					30	0	0	0	443
					31	0	0	0	441
Total	10,948	4,099	2,508			6,800	1,790	1,367	

Table 10. Diversions to New York City water-supply system.—Continued
(River Master daily operation record)

[Million gallons per day for 24-hour period beginning 0800 local time]

Date 2007	East Delaware Tunnel	West Delaware Tunnel	Neversink Tunnel	Average June 1, 2006, to date	Date 2007	East Delaware Tunnel	West Delaware Tunnel	Neversink Tunnel	Average June 1, 2006, to date
Apr. 1	0	0	0	440	May 1	0	99	121	436
2	300	58	0	439	2	0	250	113	436
3	311	0	165	439	3	0	455	195	437
4	353	0	16	439	4	239	360	86	438
5	353	0	94	439	5	401	299	0	438
6	353	0	94	439	6	392	299	0	439
7	354	0	0	439	7	399	299	99	440
8	353	0	0	439	8	399	299	91	441
9	407	0	0	439	9	399	299	100	442
10	291	0	0	438	10	372	254	100	443
11	351	104	0	438	11	401	298	101	444
12	506	0	0	438	12	400	298	0	445
13	333	0	129	439	13	401	298	0	446
14	300	0	154	439	14	401	298	74	447
15	121	0	98	438	15	56	376	183	447
16	0	0	0	437	16	368	306	63	448
17	0	0	0	435	17	401	299	90	449
18	0	0	0	434	18	435	299	91	450
19	0	0	0	432	19	449	299	0	451
20	0	0	0	431	20	449	299	0	452
21	315	0	0	431	21	449	299	76	453
22	399	0	0	431	22	450	299	77	454
23	462	0	183	431	23	450	299	75	455
24	499	0	254	432	24	450	299	78	456
25	500	0	253	433	25	271	299	210	457
26	500	0	251	434	26	401	299	164	458
27	93	189	345	435	27	401	299	167	459
28	0	298	399	436	28	401	299	167	460
29	0	298	399	436	29	446	299	81	461
30	0	288	394	437	30	413	299	52	462
					31	400	299	53	463
Total	7,454	1,235	3,228			10,894	9,272	2,707	

Table 10. Diversions to New York City water-supply system.—Continued
(River Master daily operation record)

[Million gallons per day for 24-hour period beginning 0800 local time]

Date 2007	East Delaware Tunnel	West Delaware Tunnel	Neversink Tunnel	Average June 1, 2007, to date	Date 2007	East Delaware Tunnel	West Delaware Tunnel	Neversink Tunnel	Average June 1, 2007, to date
June 1	367	299	52	718	July 1	498	199	0	696
2	350	299	0	684	2	500	199	104	699
3	350	87	0	601	3	499	199	53	701
4	350	205	0	590	4	493	197	54	702
5	399	298	0	611	5	375	200	52	700
6	400	298	0	626	6	499	200	51	701
7	401	298	0	636	7	499	200	0	701
8	436	298	0	648	8	499	200	0	701
9	450	298	0	659	9	501	200	52	703
10	450	298	0	668	10	501	200	53	704
11	450	298	51	680	11	501	199	51	705
12	450	297	52	690	12	498	285	0	707
13	451	298	52	699	13	500	298	0	709
14	366	298	20	698	14	500	298	0	711
15	316	297	0	692	15	500	298	0	713
16	303	259	0	684	16	500	298	0	715
17	304	242	0	676	17	500	298	0	717
18	432	20	51	666	18	499	298	0	718
19	452	0	0	655	19	499	298	0	720
20	29	275	181	646	20	500	298	0	721
21	0	433	195	645	21	500	298	0	723
22	0	435	338	651	22	500	298	0	724
23	0	481	349	659	23	501	299	0	726
24	0	481	349	666	24	501	299	0	727
25	334	350	349	681	25	501	299	0	728
26	500	203	100	686	26	501	299	0	730
27	501	198	110	690	27	501	199	0	729
28	501	198	50	692	28	501	199	0	729
29	498	199	101	696	29	501	199	0	728
30	499	199	0	696	30	501	199	0	728
					31	501	199	42	728
Total	10,339	8,139	2,400			15,370	7,649	512	

Table 10. Diversions to New York City water-supply system.—Continued
(River Master daily operation record)

[Million gallons per day for 24-hour period beginning 0800 local time]

Date 2007	East Delaware Tunnel	West Delaware Tunnel	Neversink Tunnel	Average June 1, 2007, to date	Date 2007	East Delaware Tunnel	West Delaware Tunnel	Neversink Tunnel	Average June 1, 2007, to date
Aug. 1	501	199	0	728	Sept. 1	315	152	0	714
2	443	197	0	726	2	491	264	0	715
3	500	199	0	726	3	491	263	0	715
4	500	199	0	725	4	501	99	165	715
5	500	199	0	725	5	500	0	266	716
6	499	199	0	725	6	502	0	266	717
7	501	293	0	726	7	502	0	350	718
8	501	298	0	727	8	500	0	350	719
9	500	298	0	728	9	499	0	317	720
10	501	298	0	729	10	498	0	258	721
11	501	298	0	730	11	501	188	56	721
12	500	298	0	731	12	500	265	0	721
13	281	298	0	729	13	497	262	0	722
14	500	298	0	729	14	502	200	0	721
15	500	298	0	730	15	502	200	0	721
16	454	210	0	729	16	502	200	0	721
17	444	196	0	728	17	502	200	0	721
18	448	198	0	727	18	501	199	0	721
19	448	198	0	726	19	501	199	0	720
20	444	198	0	725	20	501	199	0	720
21	448	197	0	724	21	501	199	0	720
22	451	198	0	723	22	501	200	0	720
23	451	198	0	722	23	501	199	0	720
24	411	198	0	721	24	500	199	0	720
25	404	198	0	720	25	500	197	0	719
26	404	199	0	718	26	501	195	5	719
27	401	199	0	717	27	500	195	0	719
28	400	273	0	717	28	501	195	0	719
29	402	299	0	716	29	501	195	11	719
30	402	298	0	716	30	480	195	0	718
31	501	266	0	717					
Total	14,141	7,392	0			14,794	4,859	2,044	

Table 10. Diversions to New York City water-supply system.—Continued
(River Master daily operation record)

[Million gallons per day for 24-hour period beginning 0800 local time]

Date 2007	East Delaware Tunnel	West Delaware Tunnel	Neversink Tunnel	Average June 1, 2007, to date	Date 2007	East Delaware Tunnel	West Delaware Tunnel	Neversink Tunnel	Average June 1, 2007, to date
Oct. 1	0	289	82	716	Nov. 1	502	0	0	688
2	0	296	123	713	2	502	0	0	687
3	311	296	109	713	3	523	0	0	686
4	498	293	0	714	4	502	0	0	685
5	500	195	0	714	5	502	0	0	684
6	500	194	0	713	6	502	0	0	683
7	456	178	0	713	7	502	0	0	682
8	393	162	0	712	8	502	176	200	683
9	500	245	0	712	9	501	190	146	684
10	500	196	0	712	10	501	0	148	684
11	500	19	0	710	11	501	9	147	683
12	501	0	0	709	12	464	123	147	684
13	501	0	0	707	13	334	0	0	682
14	500	0	0	706	14	499	0	0	680
15	500	0	0	704	15	500	0	0	679
16	500	0	0	703	16	502	0	0	678
17	500	0	0	701	17	502	0	0	677
18	500	0	48	700	18	464	0	0	676
19	500	0	0	699	19	3	0	0	672
20	500	0	0	697	20	0	0	0	668
21	500	0	0	696	21	72	0	0	665
22	500	0	0	695	22	490	0	0	664
23	501	176	2	695	23	490	0	0	663
24	456	195	0	694	24	494	0	0	662
25	500	212	0	694	25	454	0	0	661
26	506	212	0	694	26	0	0	0	657
27	507	200	0	695	27	0	185	228	656
28	509	5	0	693	28	0	226	266	655
29	503	0	0	692	29	330	49	64	654
30	502	0	0	691	30	498	0	0	653
31	502	0	0	690					
Total	14,146	3,363	364			11,636	958	1,346	

Table 11. Daily mean discharge, East Branch Delaware River at Downsville, New York (station number 01417000), for report year ending November 30, 2007. (U.S. Geological Survey published record)

[All values except total are in cubic feet per second, ft^3/s; total in cubic feet per second days, (ft^3/s)-d]

DAY	DEC	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV
1	1,200	173	678	172	2,260	1,060	143	612	153	143	67	56
2	1,720	173	679	173	1,780	926	143	461	159	144	76	56
3	1,540	173	679	173	1,320	673	111	236	183	144	76	56
4	1,340	173	679	173	1,160	510	111	189	173	144	76	58
5	1,140	174	613	173	1,170	316	113	204	156	151	76	57
6	848	174	524	173	1,040	198	128	230	155	158	76	57
7	717	174	672	173	886	113	147	183	152	162	76	56
8	704	305	588	173	748	98	150	183	148	166	76	56
9	704	672	431	172	695	103	149	183	189	166	76	56
10	704	690	298	172	692	112	150	182	141	169	76	56
11	705	691	187	172	692	112	150	172	123	170	67	56
12	705	691	169	172	692	112	149	282	141	147	58	56
13	706	691	170	173	692	113	150	409	150	122	58	56
14	707	691	170	173	692	113	150	312	141	116	58	57
15	710	692	170	135	695	119	148	161	122	116	57	58
16	709	690	238	127	3,210	124	152	154	138	115	57	58
17	712	898	292	174	5,360	115	155	154	142	115	56	58
18	712	1,250	248	174	4,620	115	155	154	139	106	56	58
19	714	1,320	169	328	3,830	116	155	154	139	106	55	57
20	716	1,140	169	685	3,520	114	126	255	135	112	55	57
21	716	943	170	691	3,140	114	99	250	132	119	56	58
22	645	790	170	691	2,720	125	220	154	132	125	55	57
23	534	704	170	696	2,450	125	236	154	148	133	55	68
24	350	683	170	704	2,230	131	144	154	155	140	55	76
25	200	683	171	704	1,910	140	144	154	152	144	54	76
26	175	686	169	704	1,580	142	146	155	156	147	57	78
27	175	686	168	704	1,230	142	152	154	139	148	58	76
28	176	687	171	1,490	1,280	142	190	142	139	147	58	77
29	176	688		2,640	1,260	143	353	151	138	147	58	77
30	172	689		2,630	1,160	143	554	190	140	146	58	78
31	173	680		2,470		143		181	143		57	
Total	21,205	19,554	9,182	18,164	54,714	6,752	5,073	6,709	4,553	4,168	1,949	1,856
Mean	684	631	328	586	1,824	218	169	216	147	139	62.9	61.9

Year total 153,879 (ft^3/s)-d

Mean 422 ft^3/s

Table 12. Daily mean discharge, West Branch Delaware River at Stilesville, New York (station number 01425000), for report year ending November 30, 2007. (U.S. Geological Survey published record)

[All values except total are in cubic feet per second, ft^3/s; total in cubic feet per second days, (ft^3/s)-d]

DAY	DEC	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV
1	1,090	817	996	405	3,400	1,080	395	239	441	890	1,050	90
2	1,160	989	1,000	406	2,760	949	362	235	442	875	1,090	90
3	1,190	989	991	406	2,320	651	234	216	572	504	1,110	90
4	1,150	989	994	404	2,030	378	167	215	676	502	1,130	90
5	1,110	944	923	406	1,970	206	157	183	458	548	1,250	90
6	1,070	936	897	490	1,820	148	164	196	429	575	1,260	91
7	1,020	990	1,000	883	1,660	148	273	335	443	632	1,260	91
8	990	1,020	927	954	1,500	140	432	434	370	755	1,180	91
9	989	1,020	678	911	1,350	125	393	468	300	367	899	91
10	989	1,000	430	737	1,250	137	354	542	279	371	605	91
11	989	989	267	499	1,130	138	350	505	250	397	266	91
12	989	989	240	275	1,070	137	384	456	313	346	116	92
13	989	989	239	244	1,110	140	321	336	350	216	90	93
14	989	1,040	247	246	1,130	134	464	375	350	625	84	91
15	989	1,320	239	226	1,200	129	688	401	350	765	81	96
16	989	2,280	351	184	2,550	134	634	392	334	340	80	95
17	989	2,710	869	678	4,000	115	362	383	615	349	174	93
18	989	2,550	949	976	4,450	117	482	371	492	374	101	92
19	989	2,320	949	982	4,950	139	568	284	362	416	85	92
20	989	2,030	949	980	5,220	152	397	203	422	455	321	92
21	989	1,750	949	976	4,760	148	227	473	323	579	113	93
22	989	1,540	949	976	4,130	157	206	289	221	884	84	92
23	989	1,370	949	999	3,780	159	205	224	208	503	83	100
24	989	1,210	949	1,580	3,270	186	232	219	416	510	84	115
25	989	1,080	949	3,120	2,870	250	501	237	448	505	84	116
26	989	1,000	880	3,610	2,530	229	586	324	440	896	85	122
27	989	989	651	4,780	2,150	199	596	385	400	762	90	131
28	948	989	439	5,650	1,710	188	587	362	409	780	92	126
29	800	989		5,370	1,420	199	380	362	414	900	90	120
30	521	989		4,460	1,220	220	305	419	477	923	90	116
31	403	986		4,080		221		441	938		91	
Total	30,243	39,803	20,850	46,893	74,710	7,453	11,406	10,504	12,942	17,544	13,218	2,963
Mean	976	1,284	745	1,513	2,490	240	380	339	417	585	426	98.8

Year total 288,529 (ft^3/s)-d

Mean 790 ft^3/s

Table 13. Daily mean discharge, Neversink River at Neversink, New York (station number 01436000), for report year ending November 30, 2007.

[All values except total are in cubic feet per second, ft^3/s; total in cubic feet per second days, (ft^3/s)-d]

DAY	DEC	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV
1	178	87	84	82	230	66	126	126	115	110	98	46
2	175	127	84	82	169	65	136	126	133	111	66	46
3	159	177	84	79	202	73	135	123	145	113	65	46
4	113	179	83	76	183	73	129	118	155	118	65	45
5	87	179	83	73	229	73	126	113	157	120	68	45
6	86	179	84	75	148	75	122	126	154	120	69	45
7	85	179	84	79	140	75	116	126	160	120	69	45
8	81	128	84	78	140	76	120	126	114	120	69	45
9	81	123	84	79	129	83	120	134	90	120	69	45
10	82	214	84	79	83	95	120	147	81	120	69	45
11	84	183	86	78	77	95	120	138	71	120	69	45
12	84	179	85	93	117	95	118	123	111	120	58	45
13	85	175	84	66	129	96	117	125	121	117	45	45
14	86	175	83	79	108	98	120	135	118	114	44	45
15	86	175	83	71	206	98	120	135	114	113	45	46
16	86	174	84	62	4,270	98	131	130	107	112	45	44
17	86	174	85	59	1,920	98	142	123	105	113	45	45
18	88	175	87	49	1,050	104	142	116	105	113	45	46
19	88	173	86	39	769	115	142	111	106	114	45	45
20	88	169	86	48	755	109	127	115	106	114	46	45
21	88	167	86	101	722	108	118	120	104	112	45	45
22	88	167	86	102	716	120	117	120	100	111	45	44
23	88	167	84	106	611	120	120	120	100	112	45	53
24	88	167	85	109	389	120	123	120	105	114	46	60
25	88	151	86	112	252	120	124	124	119	116	46	60
26	88	104	86	114	215	118	129	132	121	120	46	60
27	86	84	86	119	187	120	139	132	104	120	46	60
28	86	84	84	87	178	118	132	121	103	120	45	60
29	86	84		88	148	126	126	104	103	120	46	60
30	86	84		117	74	130	126	95	103	120	46	60
31	86	84		154		121		93	106		46	
Total	2,946	4,667	2,370	2,635	14,546	3,081	3,783	3,797	3,536	3,487	1,696	1,466
Mean	95.0	151	84.6	85.0	485	99.4	126	122	114	116	54.7	48.9

Year total 48,010 (ft^3/s)-d

Mean 132 ft^3/s

Table 14. Daily mean discharge, Delaware River at Montague, New Jersey (station number 01438500), for report year ending November 30, 2007. (U.S. Geological Survey published record)

[All values except total are in cubic feet per second, ft^3/s; total in cubic feet per second days, (ft^3/s)-d; e, estimated]

DAY	DEC	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV
1	7,620	5,230	5,000	e3,200	17,800	8,620	1,770	1,750	2,890	1,910	1,780	5,090
2	9,920	7,240	4,760	e5,400	16,900	7,760	1,980	1,800	2,290	1,830	1,750	4,430
3	11,100	6,960	e4,700	e7,100	15,400	7,260	1,900	1,770	2,100	1,780	1,740	3,940
4	9,800	6,280	e3,600	e6,700	14,200	6,030	2,420	1,760	2,430	1,750	1,730	3,250
5	8,740	6,040	e3,000	e5,800	16,600	5,050	2,920	1,890	2,140	1,870	1,730	3,000
6	7,930	8,170	e3,300	e4,600	14,800	4,330	2,530	2,630	2,010	1,750	1,740	3,080
7	7,300	15,000	e3,500	e3,800	12,400	3,820	2,310	2,950	2,040	1,860	1,820	3,320
8	6,720	15,900	e3,300	e3,700	10,700	3,590	2,160	2,370	2,320	1,920	1,860	3,620
9	6,010	21,200	e3,500	e4,000	9,600	3,280	2,000	2,180	2,940	2,100	1,900	3,190
10	5,750	16,000	e3,800	e4,200	8,550	3,170	1,960	2,350	3,480	1,710	2,280	2,960
11	5,570	12,900	e3,200	e4,100	7,750	3,610	1,950	2,340	4,460	2,130	2,700	2,630
12	5,400	10,700	e2,900	e4,500	7,590	4,420	2,180	2,420	3,540	1,960	4,980	2,590
13	5,210	10,100	e2,700	e5,200	9,600	3,930	2,220	2,230	2,760	2,490	5,220	2,980
14	5,310	10,200	e2,300	e6,800	9,050	3,400	2,180	2,150	2,860	2,380	3,330	3,870
15	5,370	11,700	e2,000	15,300	10,500	3,230	2,050	1,740	2,550	1,800	2,500	7,120
16	5,130	18,200	e2,300	26,100	56,800	3,100	1,880	1,750	2,550	1,800	2,090	19,800
17	4,880	16,600	e2,600	16,100	53,500	3,170	2,100	1,910	2,590	2,090	1,800	13,700
18	4,670	13,600	e2,600	12,800	38,400	3,450	1,960	2,050	2,070	1,910	1,580	9,660
19	4,600	12,200	e2,900	10,600	31,500	2,820	1,950	1,890	2,100	1,690	1,520	7,610
20	4,420	11,100	e3,500	9,270	28,200	2,640	2,250	1,930	1,880	1,770	2,310	7,150
21	4,330	9,560	e3,700	8,140	23,700	2,600	4,260	2,000	2,200	1,680	3,430	8,730
22	4,270	8,370	e3,600	8,400	20,200	2,540	2,930	1,310	2,990	1,690	3,270	8,480
23	4,910	7,700	e3,600	13,900	18,300	2,390	2,160	1,750	2,700	1,780	2,430	7,060
24	6,390	7,080	e3,500	18,100	16,500	2,380	1,800	3,110	2,540	1,760	2,190	6,240
25	5,970	6,520	e3,100	20,700	13,400	2,310	1,770	3,190	2,390	1,750	2,990	5,630
26	5,660	6,290	e2,900	24,400	12,700	2,360	2,240	2,780	2,230	1,710	3,490	6,560
27	7,050	5,260	e3,300	26,400	11,900	2,070	2,050	2,380	2,260	1,900	4,640	12,900
28	6,800	4,820	e3,200	34,000	10,700	2,030	2,260	3,450	2,130	1,680	16,500	15,400
29	6,130	5,210		30,600	9,580	2,200	2,600	4,440	1,890	1,650	11,600	11,600
30	5,570	5,130		24,600	9,050	2,040	2,050	3,860	1,860	1,820	7,870	9,400
31	5,330	5,170		20,400		1,840		3,250	1,760		6,140	
Total	193,860	306,430	92,360	388,910	535,870	111,440	66,790	73,380	76,950	55,920	110,910	204,990
Mean	6,254	9,885	3,299	12,550	17,860	3,595	2,226	2,367	2,482	1,864	3,578	6,833

Year total 2,217,810 (ft^3/s)-d

Mean 6,076 ft^3/s

Table 15. Diversions by New Jersey; daily mean discharge, Delaware and Raritan Canal at Port Mercer, New Jersey (station number 01460440), for report year ending November 30, 2007.
(U.S. Geological Survey published record)

[All data except total are in million gallons per day, Mgal/d; total in million gallons, Mgal; e, estimated; negative values indicate reverse flows]

DAY	DEC	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV
1	87	54	90	90	91	86	95	97	89	85	89	93
2	84	70	89	17	89	87	92	98	89	82	90	90
3	86	80	90	68	91	88	95	e90	88	86	91	92
4	85	87	88	78	86	89	86	e97	85	84	93	92
5	85	96	83	84	79	88	91	e94	85	83	92	91
6	84	96	93	87	85	91	93	92	87	84	92	92
7	85	98	99	85	88	91	94	85	89	84	92	92
8	85	55	99	88	89	91	96	95	83	83	94	91
9	e83	83	99	83	92	94	97	88	87	83	90	92
10	e83	89	99	84	94	97	94	86	84	83	96	89
11	e79	92	98	87	94	95	95	e89	82	80	93	85
12	e78	94	99	88	71	95	96	e90	83	79	91	83
13	e84	95	98	90	74	93	96	93	81	e79	89	87
14	85	98	100	92	86	92	96	92	79	e79	88	92
15	76	97	103	93	e-86	89	97	90	79	80	89	93
16	e77	98	e98	78	e-412	90	98	84	80	80	95	90
17	e78	96	102	77	43	86	99	e87	85	84	95	90
18	e78	97	100	80	82	87	99	e89	82	87	93	88
19	e79	96	e97	82	90	89	101	91	83	87	94	86
20	e79	97	102	77	90	91	100	88	81	87	77	88
21	e87	96	104	78	92	93	99	e83	78	87	90	93
22	90	94	101	82	95	94	98	86	77	88	91	96
23	76	93	101	81	95	95	95	85	82	88	91	94
24	75	92	99	84	95	94	95	84	91	89	90	93
25	80	92	98	84	95	94	96	85	89	88	93	95
26	69	91	97	84	96	94	97	86	90	88	91	93
27	83	96	93	86	55	96	99	87	88	87	67	94
28	90	93	88	88	70	94	92	87	87	87	75	91
29	93	94		87	82	94	90	85	88	89	83	91
30	94	92		90	81	94	97	88	88	89	86	95
31	92	91		92		96		85	87		87	
Total	2,569	2,792	2,707	2,544	1,872	2,847	2,868	2,756	2,626	2,539	2,767	2,731
Mean	82.9	90.1	96.7	82.1	62.4	91.8	95.6	88.9	84.7	84.6	89.3	91.0

Year total 31,618 Mgal

Mean 86.6 Mgal/d

QUALITY OF WATER IN THE DELAWARE ESTUARY

Introduction

This section describes the water-quality monitoring program for the Delaware Estuary during the River Master 2007 report year, December 1, 2006, to November 30, 2007. This program is conducted by the USGS, in cooperation with the DRBC. Selected data collected for this program are presented and water-quality conditions are summarized. The DRBC and others use these data to assess water-quality conditions and track the movement of the "salt front" in the Delaware Estuary.

Water-Quality Monitoring Program

As part of a long-term program, the quality of water in the Delaware Estuary between Trenton, New Jersey, and Reedy Island Jetty, Delaware, is monitored at various locations (fig. 6). Data on water temperature, specific conductance, dissolved oxygen, and pH were collected by electronic instruments at four sites—Trenton, Benjamin Franklin Bridge (Philadelphia), Chester, and Reedy Island Jetty. Water-quality monitors at Trenton and Reedy Island Jetty were operated continuously throughout the report year and seasonally at the Benjamin Franklin Bridge and Chester.

The frequency of water-quality sampling was monthly in March, June, July, and October, and twice-monthly in April, May, August, and September 2007. Water samples at 19 sites between Biles Channel and Mahon River (sites A–T on fig. 6) were collected and analyzed by the State of Delaware for the DRBC. At each of these sites, water samples were collected near the center of the channel at a depth of 3 feet below the water surface and analyzed for selected physical properties and chemical constituents including, but not limited to, water temperature, chloride, alkalinity, specific conductance, dissolved oxygen, pH, selected nutrients, and trace metals. These analyses consist of field measurements and laboratory determinations.

From March to October, but excluding June, water-quality samples were collected on a monthly basis at three additional sites in the lower Delaware Bay (sites U–W on fig. 6) and analyzed for selected physical properties and chemical constituents.

Data obtained from the electronic water-quality monitors are processed and stored in the USGS National Water Information System database. These data are posted online by the USGS in annual water resources data reports for New Jersey and Pennsylvania. Water-quality data for the other sampling sites are not presented in this report but are available from DRBC and STORET, an environmental quality database operated by the U.S. Environmental Protection Agency.

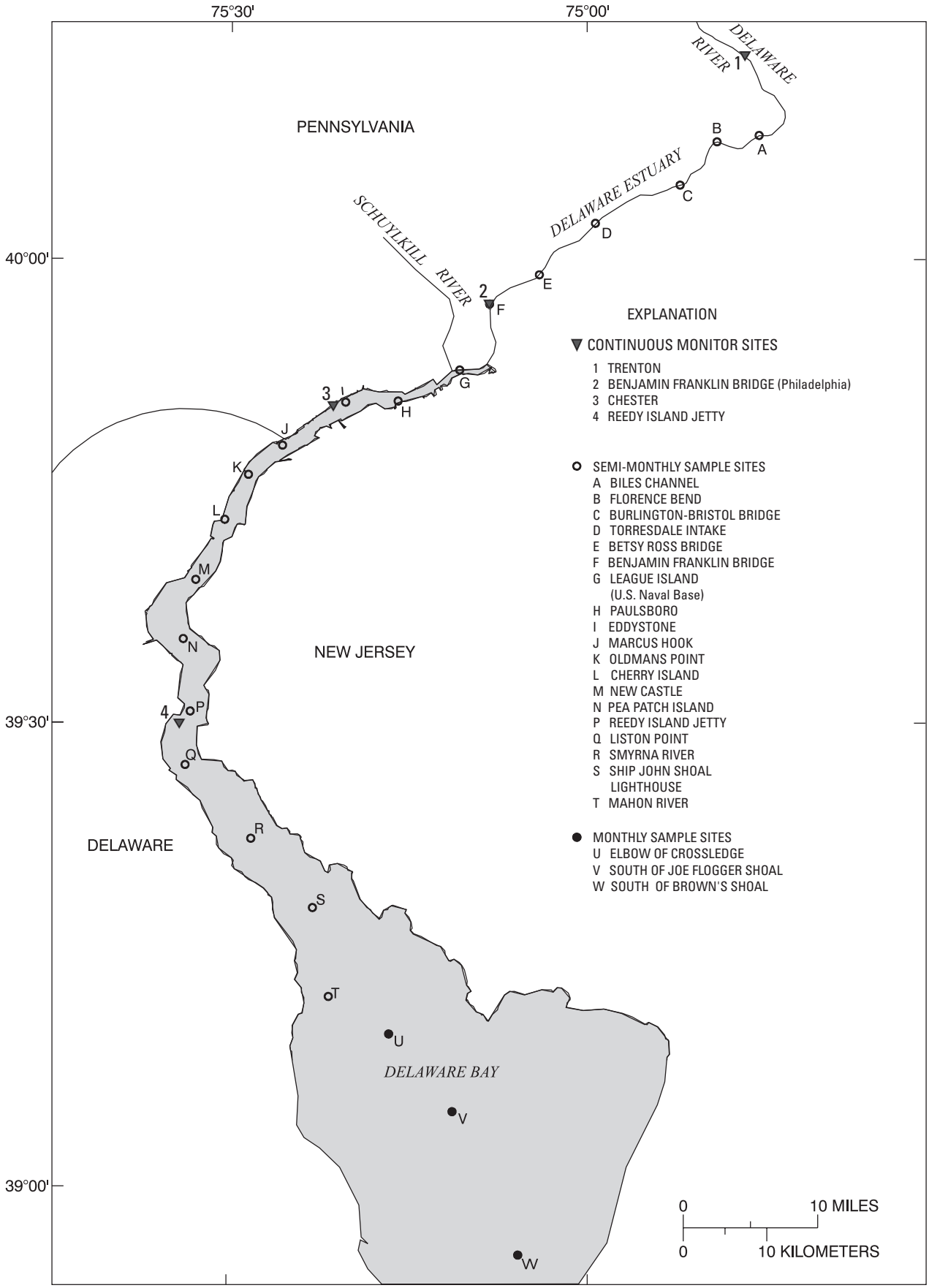

Figure 6. Location of water-quality monitoring sites on the Delaware Estuary.

Water Quality During the 2007 Report Year

Streamflow

Streamflow has a major effect on the quality of water in the Delaware Estuary. High freshwater inflows commonly result in improved water quality by limiting the upstream movement of seawater and reducing the concentration of dissolved substances. High inflows also aid in maintaining lower water temperatures during warm weather and in supporting higher concentrations of dissolved oxygen. Under certain conditions, however, high streamflows can transport large quantities of nutrients to the estuary, which may result in excessive levels of algae.

Streamflow from the Delaware River Basin upstream of Trenton, New Jersey, is the major source of freshwater inflow to the Delaware Estuary. During the report year, monthly mean streamflow measured at the USGS gaging station Delaware River at Trenton, New Jersey, was highest during April 2007 (35,000 ft^3/s) and lowest during September 2007 (3,862 ft^3/s; table 16[3]). Monthly mean streamflows were less than long-term mean monthly flows in February, May, June, July, and September 2007, and greater than the long-term flows in the other seven months. The greatest flow deficiency was in February 2007, when monthly mean streamflow was 54 percent of the long-term mean monthly flow. Long-term monthly mean streamflow was computed on the basis of data for the period from 1913 to 2006. The highest daily mean streamflow during the report year was 111,000 ft^3/s on April 17, 2007. The lowest daily mean streamflow was 3,000 ft^3/s on October 8, 2007.

Water Temperature

Water temperature has an important influence on water quality, as it affects various physical, chemical, and biological properties of water. Generally, increases in water temperature have detrimental effects on water quality by decreasing the saturation level of dissolved oxygen and increasing the biological activity of aquatic organisms. Although the primary factors that affect water temperature in the Delaware Estuary are climatic, various kinds of water use, especially powerplant cooling, also can have significant effects.

At the Benjamin Franklin Bridge, Philadelphia, Pennsylvania, water-temperature data were collected continuously from April to November 2007. Monthly mean temperatures were greater than the long-term mean monthly temperatures in May, June, August, September, and October 2007, and were less than the long-term means in April, July, and November 2007. Long-term mean water temperatures were computed using data for the period from 1964 to 2006 (fig. 7). The maximum daily mean water temperature of 28.3˚C was recorded on August 9, 2007.

Specific Conductance and Chloride

Specific conductance is a measure of the capacity of water to conduct an electrical current and is a function of the types and quantities of dissolved substances in water. As concentrations of dissolved ions increase, specific conductance of the water also increases. Specific conductance measurements are good indicators of dissolved solids content and total ion concentrations. Seawater and some man-made constituents can cause the specific conductance of estuary water to increase substantially. Dilution associated

[3]All numbered tables in the section "Quality of Water in the Delaware Estuary" are grouped at the end of this section, beginning on page 67.

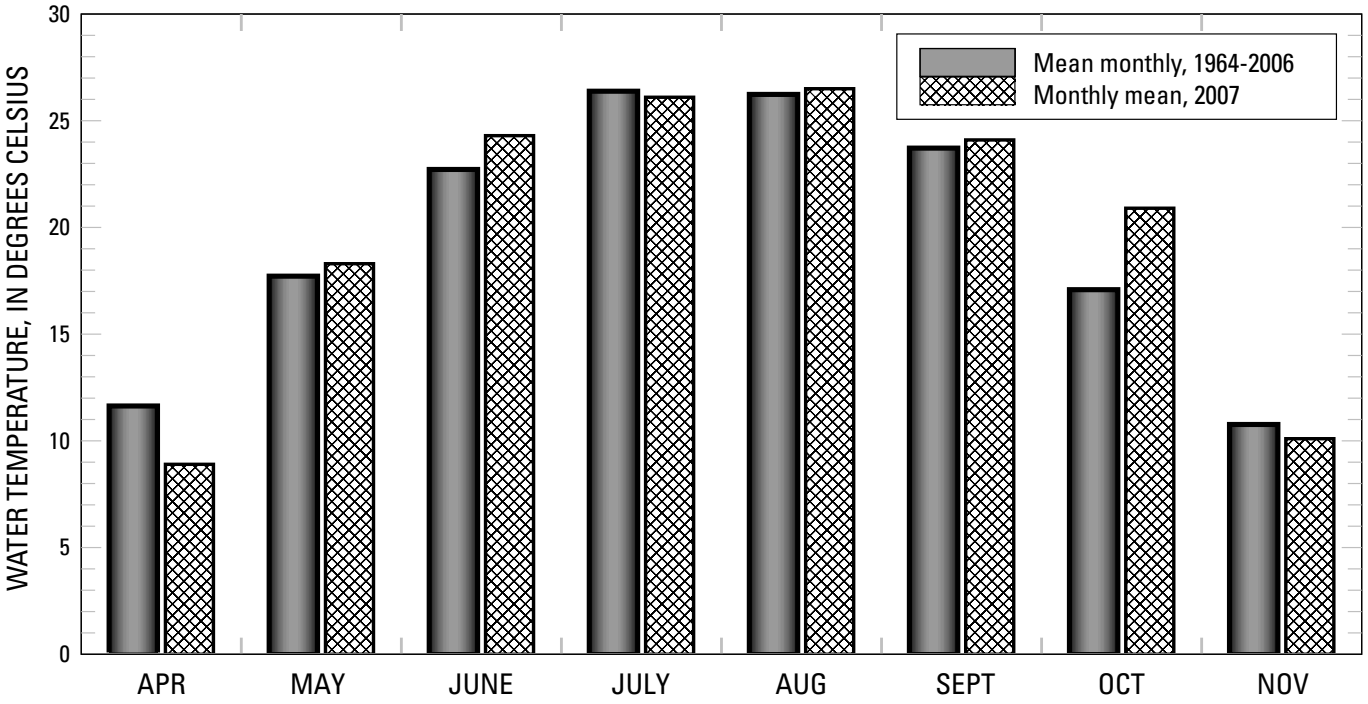

Figure 7. Water temperature in the Delaware Estuary at Benjamin Franklin Bridge at Philadelphia, Pennsylvania, April to November.

with high freshwater inflows results in decreased levels of dissolved solids and lower specific conductance, whereas low inflows have the opposite effect.

The upstream movement of seawater and the accompanying increase in chloride concentrations is an important concern for water supplies obtained from the Delaware Estuary. Water with chloride concentrations greater than 250 milligrams per liter (mg/L) is considered undesirable for domestic use, and water with concentrations exceeding 50 mg/L is unsatisfactory for chemically sensitive consumers and some industrial processes. Chloride concentrations in the estuary increase in a downstream direction, with increasing proximity to the Atlantic Ocean.

Chloride concentration was not measured directly at the monitor site at Reedy Island Jetty, Delaware. Rather, a mathematical relation between specific conductance and chloride concentration, developed on the basis of long-term field measurements of specific conductance and laboratory analyses of chloride was used to estimate chloride concentrations from specific conductance values. Chloride concentrations estimated from the relation are presented in table 17. The specific conductance-chloride relation is less reliable when chloride concentrations are less than 30 mg/L, because other chemical substances may be present in quantities large enough to affect the relation. Thus, chloride concentrations estimated from specific conductance data are not presented when concentrations of less than 30 mg/L result from the relation. Instead, estimated values less than 30 mg/L are reported as <30 mg/L. Chloride concentrations at Chester, Pennsylvania (table 18), were measured directly by Kimberly Clark Chester Operations and are not derived from specific conductance data.

At Chester, the greatest daily maximum chloride concentration was 700 mg/L on September 10, 2007 (table 18). During the report year, daily maximum concentrations exceeded 50 mg/L on 70 percent of the days. The lowest daily minimum chloride concentration was 28 mg/L on April 18, 2007. Daily minimum

concentrations exceeded 50 mg/L on 55 percent of the days. Chloride concentrations were persistently high from April 29 to September 30, 2007, when daily minimum concentrations exceeded 50 mg/L on most days.

At Reedy Island Jetty, the greatest daily maximum chloride concentration was 9,400 mg/L on February 14, 2007 (table 17). Daily maximum chloride concentrations during the report year exceeded 1,000 mg/L on 90 percent of the days. The lowest daily minimum chloride concentration was <30 mg/L on several days in April and May 2007. Daily minimum chloride concentrations exceeded 1,000 mg/L on nearly 60 percent of the days. From December to May, daily maximum chloride concentrations at Reedy Island Jetty ranged from <30 to 9,400 mg/L. From June to November, daily maximum chloride concentrations ranged from 3,400 to 7,900 mg/L.

Dissolved Oxygen

Dissolved oxygen in water is necessary for the respiratory processes of aquatic organisms and for chemical reactions in aquatic environments. Fish and many other clean-water species require relatively high dissolved-oxygen concentrations at all times. The major source of dissolved oxygen in the Delaware Estuary is diffusion from the atmosphere, and, to a lesser extent, photosynthetic activity of aquatic plants. The principal factors that affect dissolved-oxygen concentrations in the estuary are water temperature, biochemical oxygen demand, freshwater inflow, phytoplankton, turbidity, salinity, and tidal- and wind-driven mixing.

Concentrations of dissolved oxygen at several sites on the Delaware Estuary have been measured since 1962 by the USGS. Two of these sites, Delaware River at Benjamin Franklin Bridge at Philadelphia, Pennsylvania, and Delaware River at Chester, Pennsylvania, have nearly continuous records and are in the reach of the estuary most affected by effluent discharges. The mean, and minimum daily mean, dissolved-oxygen concentrations from July to September at these stations during each of the 1965–2007 report years are shown in figure 8. Although concentrations have increased considerably over this 43-year period, mean concentrations can vary considerably from year to year.

Concentrations of dissolved oxygen in the Delaware Estuary generally are greatest near Trenton and decrease in a downstream direction. In an area just downstream of the Benjamin Franklin Bridge, concentrations commonly reach minimum levels. During the report year, daily mean concentrations of dissolved oxygen at the Benjamin Franklin Bridge monitor site were lowest in mid-June, and the lowest recorded daily mean concentration was 3.2 mg/L on June 13 (table 19). Daily mean concentrations of dissolved oxygen were consistently 6.0 mg/L or greater on all days from April 1 to May 21; September 25 to October 3; and October 13 to November 30, 2007. At Chester, daily mean dissolved-oxygen concentrations were lowest in mid-June, and the lowest recorded daily mean concentration was 4.7 mg/L on June 13, 2007 (table 20).

Histograms of hourly dissolved-oxygen concentrations at the Benjamin Franklin Bridge and Chester monitor sites during the critical summer period—July to September 2007—are presented in figure 9. Hourly concentrations at the Benjamin Franklin Bridge were 4 mg/L or less in nearly 14 percent of this period. At Chester, hourly dissolved-oxygen concentrations were 4 mg/L or less during nearly 3 percent of the 2007 critical summer period. Dissolved-oxygen concentrations less than 4 mg/L can have adverse, and possibly lethal, effects on fish and other aquatic organisms.

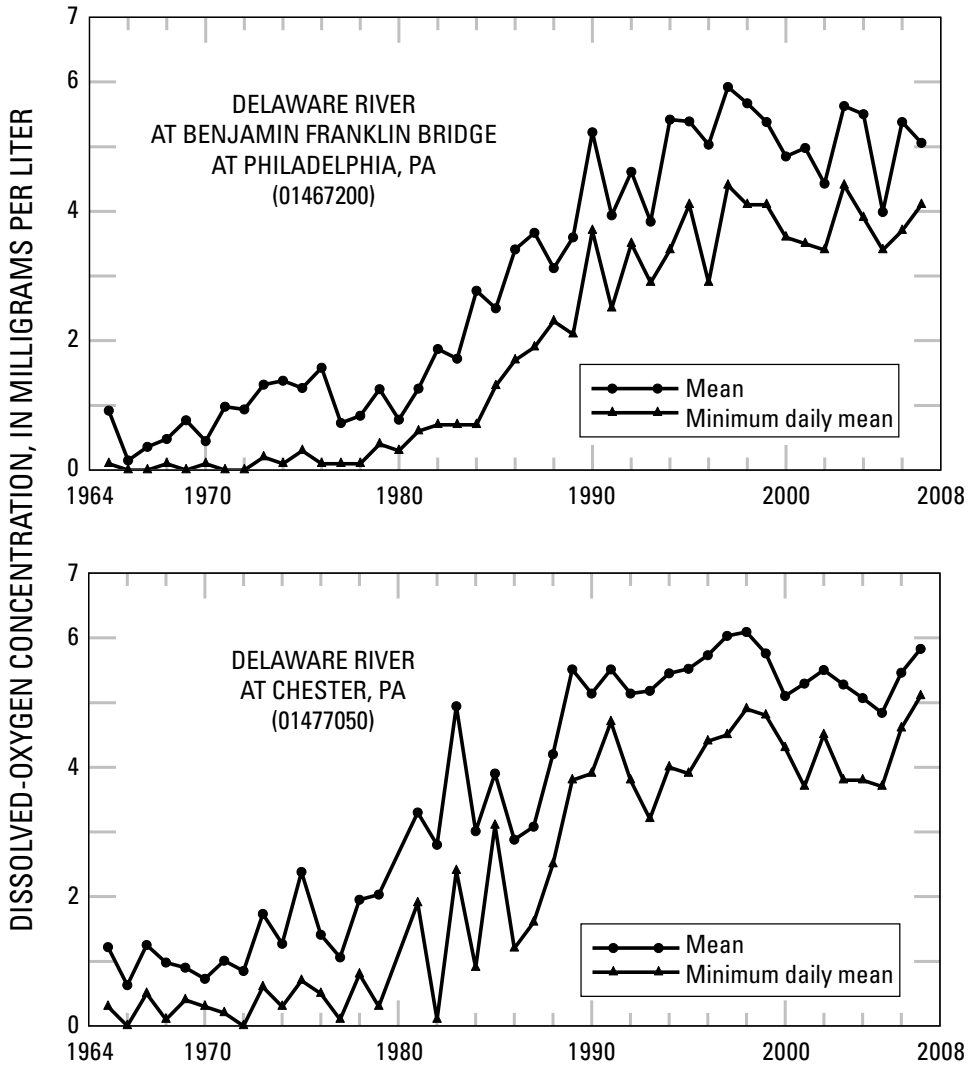

Figure 8. Mean and minimum daily mean dissolved-oxygen concentrations from July to September at two monitor sites on the Delaware Estuary, 1965–2007.

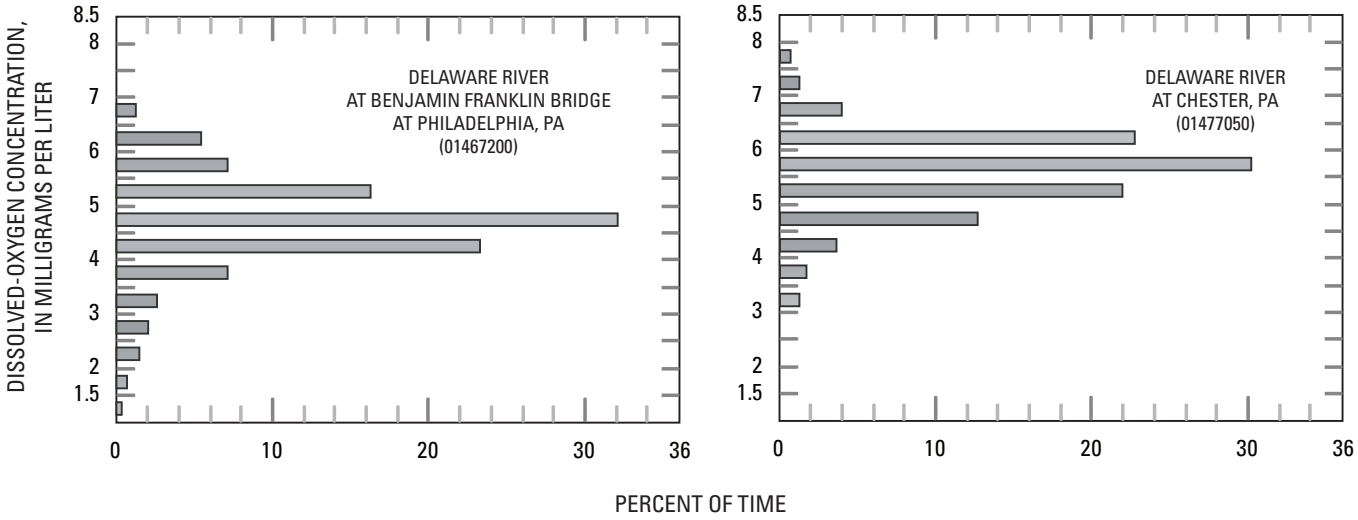

Figure 9. Distribution of hourly dissolved-oxygen concentrations at two monitor sites on the Delaware Estuary, July to September 2007.

Hydrogen-Ion Activity (pH)

The pH of a solution is a measure of the effective concentration (activity) of dissolved hydrogen ions. Solutions having pH less than 7 are characterized as acidic, whereas solutions with pH greater than 7 are considered basic or alkaline. The pH of uncontaminated surface water generally ranges from 6.5 to 8.5. Major factors affecting the pH of surface water include the geologic composition of the drainage basin and human inputs, including wastewater discharges. In addition, photosynthetic activity, and dissolved gases including carbon dioxide, hydrogen sulfide, and ammonia can have a considerable effect on pH. During the report year, pH was measured seasonally at the Benjamin Franklin Bridge and Chester monitor sites, and continuously at the Reedy Island Jetty site. During these periods, the ranges of daily median pH measured at these stations were as follows: Benjamin Franklin Bridge, 7.1 to 7.5; Chester, 6.9 to 7.4; and Reedy Island Jetty, 7.1 to 7.9. Generally, the pH of water in the Delaware Estuary is lowest near Trenton, New Jersey, and increases (that is, water becomes more alkaline) in a downstream direction. The pH of water in the Delaware Estuary between the Benjamin Franklin Bridge and Reedy Island Jetty is not a limiting factor for aquatic health or other beneficial uses of the water.

Table 16. Daily mean discharge, Delaware River at Trenton, New Jersey (station number 01463500), for report year ending November 30, 2007. (U.S. Geological Survey published record)

[All values, except total, are in cubic feet per second ft^3/s; total in cubic feet per second days, (ft^3/s)-d; e, estimated]

DAY	DEC	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV
1	17,000	19,900	9,500	7,820	30,000	18,200	5,190	5,420	6,650	4,650	3,540	14,500
2	17,800	20,100	9,280	24,800	27,500	18,700	7,150	4,470	5,900	4,320	3,800	12,300
3	19,900	17,400	9,460	32,500	26,500	17,500	6,090	4,030	4,970	4,660	3,370	10,900
4	20,400	16,500	e8,700	20,000	25,100	16,000	7,380	3,890	4,360	4,370	3,120	9,560
5	18,500	15,300	e7,150	16,300	25,300	14,200	7,340	5,810	4,330	3,960	3,040	8,120
6	16,800	15,000	e6,100	14,100	26,100	12,700	7,310	6,930	4,800	3,820	3,010	7,440
7	15,700	17,500	e6,300	11,700	23,200	11,500	6,430	5,290	4,130	3,820	3,020	7,420
8	14,500	31,800	e6,300	10,100	20,100	10,700	5,780	5,680	5,070	3,680	3,000	7,480
9	13,700	36,100	e6,250	9,200	18,100	10,200	5,310	5,370	10,000	3,750	3,080	7,530
10	12,900	36,300	e6,700	9,290	16,600	9,400	5,030	4,600	8,320	4,040	3,490	7,070
11	12,400	29,400	e6,800	9,530	15,400	9,050	4,970	4,500	8,170	4,130	4,780	6,740
12	11,800	24,100	e6,200	10,800	16,000	8,920	5,010	4,820	9,360	4,190	7,550	6,380
13	11,500	20,900	e5,900	11,300	17,300	10,000	4,860	4,930	8,010	4,410	9,740	6,210
14	11,500	19,900	e6,200	12,400	17,600	9,680	5,210	4,580	6,610	4,180	10,700	6,290
15	11,200	19,600	e4,700	15,200	36,400	8,610	5,060	4,250	5,830	4,550	8,310	7,240
16	11,100	21,000	e5,000	30,400	94,400	8,030	4,790	4,060	5,410	4,260	6,690	e15,400
17	11,000	26,800	e5,650	39,100	111,000	8,110	4,520	3,680	5,060	4,050	5,390	e27,000
18	10,500	24,400	e5,750	28,600	80,600	8,000	4,510	3,630	5,580	4,000	4,610	e20,400
19	9,980	21,000	e5,850	24,000	63,400	8,170	4,530	3,880	5,110	3,900	4,150	16,800
20	9,450	19,300	e5,950	21,700	53,800	7,870	5,220	4,140	4,890	3,700	4,890	15,000
21	9,130	17,800	e6,950	21,700	45,900	7,210	6,230	4,070	5,500	3,490	5,860	15,300
22	8,870	16,200	e7,950	20,300	38,000	6,730	6,940	3,940	7,940	3,520	6,620	16,800
23	12,900	15,000	8,190	25,600	33,300	6,490	7,020	4,120	8,490	3,420	7,130	16,600
24	14,200	14,100	7,450	34,900	31,100	6,240	5,600	4,170	7,290	3,320	6,130	14,700
25	13,600	13,200	6,970	36,500	28,600	5,850	4,940	6,720	6,360	3,330	5,540	13,000
26	16,300	12,200	6,800	38,700	26,100	5,810	4,290	6,830	6,540	3,250	6,000	13,100
27	15,200	11,400	6,490	40,600	34,000	5,760	4,210	5,930	9,040	3,280	16,300	19,800
28	14,900	10,600	7,190	43,000	26,300	6,350	5,190	5,720	7,020	3,220	23,000	26,700
29	14,700	9,970		47,900	22,400	5,620	6,690	6,560	5,970	3,390	28,800	27,100
30	13,300	9,860		42,200	20,000	5,050	6,060	8,000	5,360	3,200	22,100	22,000
31	12,400	9,660		35,000		5,140		7,710	4,780		17,200	
Total	423,130	592,290	191,730	745,240	1,050,100	291,790	168,860	157,730	196,850	115,860	243,960	404,880
Mean	13,650	19,110	6,848	24,040	35,000	9,413	5,629	5,088	6,350	3,862	7,870	13,500

Year total 4,582,420 (ft^3/s)-d

Mean 12,550 ft^3/s

Table 17. Daily maximum and minimum chloride concentrations estimated from values of specific conductance, Delaware River at Reedy Island Jetty, Delaware (station number 01482800), for report year ending November 30, 2007.

[Concentrations in milligrams per liter; ---, missing data; Max, maximum value; Min, minimum value; <, less than; n.d., not determined]

DAY	DEC		JAN		FEB		MAR		APR		MAY		JUNE		JULY		AUG		SEPT		OCT		NOV	
	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min
1	2,000	400	2,500	570	5,000	1,300	7,400	3,800	1,400	94	990	<30	3,600	990	6,000	2,800	6,800	3,600	6,700	3,700	7,400	4,500	4,400	2,300
2	680	260	1,600	300	5,000	1,600	7,800	3,500	930	140	1,200	<30	3,600	950	6,000	2,800	6,700	3,500	6,700	3,500	7,300	4,600	5,500	2,200
3	1,400	240	1,500	210	4,100	1,300	5,600	2,200	1,200	120	1,200	33	3,400	980	5,800	2,700	6,200	3,600	6,600	4,000	7,200	4,500	6,700	2,900
4	1,700	220	940	210	3,000	840	4,100	1,500	1,400	160	790	34	3,900	1,400	5,900	2,900	5,800	3,400	6,400	3,700	7,300	4,500	6,300	2,800
5	2,000	230	1,500	200	1,700	520	3,000	1,200	920	160	770	48	4,200	1,400	5,200	2,600	6,600	3,200	7,000	3,600	7,100	4,400	6,100	2,600
6	2,700	260	1,000	150	2,700	520	1,800	480	500	96	960	55	3,600	1,300	4,800	2,400	6,200	3,500	---	---	7,400	4,300	6,500	2,600
7	1,600	320	770	150	3,800	610	3,200	870	1,000	120	1,500	150	3,700	1,200	5,000	2,500	6,700	3,400	---	---	7,400	4,400	5,500	2,400
8	900	140	1,000	150	3,900	870	3,900	930	1,800	160	980	190	3,900	1,300	5,400	2,500	6,500	3,600	5,800	3,300	7,400	4,600	6,200	2,500
9	2,200	140	180	57	4,200	870	3,300	930	1,800	210	1,000	210	4,400	1,400	5,500	2,600	7,000	3,500	6,100	3,200	7,400	4,800	6,200	2,700
10	2,400	240	620	34	5,800	1,700	3,400	950	3,300	430	1,300	270	4,700	1,400	5,200	2,700	6,700	3,500	6,200	3,400	7,900	4,800	6,200	2,900
11	2,700	240	1,600	33	7,200	3,200	3,800	930	4,000	1,200	1,800	300	4,600	1,700	5,500	2,700	6,700	3,500	6,400	3,600	7,700	5,000	6,800	3,100
12	3,800	370	1,800	170	6,800	2,800	3,800	1,000	5,400	1,400	2,500	380	4,700	1,800	5,700	2,700	7,000	3,800	6,000	3,400	6,600	4,500	6,600	2,900
13	3,900	850	1,900	100	7,200	3,000	3,900	1,300	4,100	1,300	2,700	460	5,600	1,800	5,700	2,700	6,400	3,600	6,000	3,400	7,500	4,600	6,000	2,700
14	3,400	970	2,900	260	9,400	4,500	4,100	1,300	3,600	940	2,600	480	5,600	2,200	5,700	2,700	6,200	3,600	6,000	3,600	7,100	4,400	6,400	2,900
15	3,800	960	3,200	480	6,600	3,700	4,300	1,400	4,000	1,000	2,600	530	5,300	2,200	5,800	2,800	6,600	3,700	5,500	3,400	7,100	4,200	5,500	3,000
16	3,900	910	2,900	530	6,900	3,400	5,800	1,500	2,200	42	2,000	470	5,100	2,100	5,400	2,700	5,900	3,500	6,300	3,400	6,900	4,200	6,100	3,000
17	4,100	940	3,000	390	6,900	3,200	5,400	1,500	350	<30	1,700	420	4,500	2,100	5,400	2,800	5,800	3,400	6,600	3,600	7,100	4,200	5,900	2,800
18	3,700	970	3,500	520	7,200	3,400	3,400	820	190	<30	2,700	580	4,700	2,100	5,800	3,000	6,400	3,300	6,800	3,900	7,000	4,100	6,500	2,400
19	4,400	950	3,300	590	6,700	3,300	2,700	740	570	<30	3,100	660	4,600	2,100	5,400	3,000	6,300	3,400	6,500	3,900	7,100	4,000	6,600	3,100
20	4,300	1,200	1,300	170	7,300	3,600	2,600	610	32	<30	2,600	670	4,300	2,100	5,200	2,900	6,000	3,400	6,800	3,800	6,700	4,000	6,900	3,100
21	3,600	970	2,400	190	7,700	3,400	1,800	510	<30	<30	2,800	650	4,500	2,100	5,900	2,800	6,700	3,800	7,000	3,600	7,100	3,700	6,500	2,600
22	3,400	790	3,200	390	8,000	3,700	1,900	420	<30	<30	2,900	730	4,800	2,200	6,600	3,000	6,800	3,500	7,700	3,600	6,900	3,600	6,700	2,800
23	3,800	990	2,500	470	6,700	3,900	840	340	<30	<30	2,800	830	5,400	2,400	7,300	3,600	6,600	3,600	7,500	3,900	6,500	3,700	5,700	2,500
24	2,500	750	2,500	470	7,100	3,700	1,200	280	<30	<30	2,500	780	6,000	2,400	7,100	3,700	7,500	3,400	7,500	3,900	5,900	3,500	5,900	2,400
25	2,800	750	3,000	510	7,900	3,800	1,200	210	61	<30	2,100	720	5,500	2,700	7,400	3,700	7,100	3,500	7,500	4,200	6,800	3,600	5,600	2,300
26	3,000	870	2,600	430	8,200	3,900	620	150	620	<30	2,900	700	5,700	2,300	7,300	3,500	6,900	3,600	7,000	4,100	7,700	4,100	5,300	2,200
27	1,800	700	3,700	510	8,100	4,100	230	130	47	<30	3,300	780	5,700	2,300	7,500	3,600	6,900	3,600	6,900	4,000	7,200	3,800	4,100	1,800
28	2,500	610	4,100	980	7,700	3,800	770	110	360	<30	3,100	---	5,700	2,100	7,500	3,400	7,200	3,400	6,900	4,200	5,300	2,900	3,800	1,600
29	2,500	520	3,400	1,000			830	85	690	<30	3,400	880	5,500	2,300	7,200	3,400	7,200	3,800	7,100	4,000	5,900	2,700	4,100	1,500
30	2,800	530	5,300	1,200			1,600	77	690	<30	3,600	960	6,000	2,500	7,200	3,600	6,600	3,700	7,400	4,300	5,300	2,500	3,500	1,300
31	2,600	610	4,000	1,300			1,600	48			3,900	1,000			6,700	3,500					5,200	2,300		
Mean	2,800	610	2,400	410	6,200	2,700	3,100	960	n.d.	n.d.	2,200	n.d.	4,800	1,900	6,100	3,000	6,600	3,500	6,700	3,700	6,900	4,000	5,800	2,500
Max	4,400	1,200	5,300	1,300	9,400	4,500	7,800	3,800	5,400	1,400	3,900	1,000	6,000	2,700	7,500	3,700	7,500	3,800	7,700	4,300	7,900	5,000	6,900	3,100
Min	680	140	180	33	1,700	520	230	48	<30	<30	770	<30	3,400	950	4,800	2,400	5,800	3,200	5,500	3,200	5,200	2,300	3,500	1,300

Table 18. Daily maximum and minimum chloride concentrations, Delaware River at Chester, Pennsylvania (station number 01477050), for report year ending November 30, 2007.
(Record furnished by Kimberly Clark Chester Operations)

[Concentrations in milligrams per liter; Max, maximum value; Min, minimum value]

DAY	DEC		JAN		FEB		MAR		APR		MAY		JUNE		JULY		AUG		SEPT		OCT		NOV	
	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min
1	36	31	36	36	71	63	49	42	49	36	56	56	59	51	131	98	156	63	458	348	51	44	49	36
2	42	31	42	36	56	56	49	42	89	31	56	56	59	59	119	98	170	170	458	399	164	38	49	31
3	31	31	49	42	71	56	49	42	42	36	56	49	59	59	143	80	119	109	427	399	226	44	36	36
4	36	31	63	42	63	56	42	36	36	31	63	56	67	51	131	80	131	80	427	244	67	44	36	31
5	31	31	42	42	80	56	42	36	36	31	63	56	51	51	143	98	143	109	325	262	75	38	36	31
6	31	31	63	42	71	49	42	36	36	36	59	56	51	51	156	156	184	170	458	348	42	38	42	36
7	31	31	56	49	80	63	49	42	36	31	96	56	51	51	170	86	179	99	608	303	42	36	49	36
8	36	36	36	36	71	56	49	42	98	36	63	56	75	59	200	98	131	100	526	325	42	36	56	42
9	31	31	42	36	80	56	36	36	89	36	56	49	67	59	234	98	170	89	608	178	80	36	42	36
10	31	31	49	42	81	66	56	42	42	42	56	56	84	59	98	89	216	98	700	345	49	42	166	49
11	31	31	49	42	89	63	42	36	42	42	56	56	59	51	119	98	292	98	303	282	49	42	63	56
12	63	31	63	42	63	56	80	42	49	42	56	51	56	56	143	109	216	98	458	244	49	42	49	44
13	56	31	71	49	63	56	49	42	49	42	51	51	84	75	143	109	262	93	238	209	42	36	51	38
14	36	36	80	49	71	63	49	36	49	42	51	51	75	67	98	98	209	138	325	226	234	36	51	44
15	36	36	80	49	63	63	44	31	49	42	59	51	93	67	170	98	209	104	325	282	56	42	51	44
16	42	31	56	49	63	63	36	31	49	42	51	51	84	67	143	109	244	150	325	303	49	42	59	44
17	36	36	56	49	98	80	42	36	71	56	67	51	93	75	143	109	244	138	325	303	56	42	164	51
18	36	36	56	49	90	89	42	36	56	28	75	51	126	75	156	98	244	169	348	228	42	36	51	38
19	31	31	56	56	89	63	36	31	89	49	56	51	114	93	170	109	244	104	262	226	56	42	51	51
20	31	31	56	56	80	63	56	31	49	42	62	54	93	93	170	143	226	93	303	164	166	140	59	51
21	31	31	71	56	89	63	49	31	49	36	59	57	114	114	131	119	209	164	303	164	49	36	51	51
22	31	31	89	80	80	71	89	31	49	42	84	59	93	93	119	98	150	130	244	164	234	42	51	51
23	31	31	98	89	80	63	89	36	49	49	51	51	114	93	119	98	348	104	244	209	49	42	51	51
24	31	31	89	80	63	63	36	31	49	42	51	51	114	84	128	114	282	84	399	138	49	42	59	51
25	31	31	80	71	56	56	36	31	56	49	59	51	126	54	120	63	178	126	325	150	49	42	51	51
26	31	31	92	80	56	49	36	31	49	42	63	51	104	59	80	56	126	114	164	126	42	42	51	44
27	42	42	89	89	56	49	89	36	56	56	75	51	75	75	110	89	178	138	114	93	42	42	59	44
28	42	42	98	89	56	49	36	30	56	49	90	51	98	89	80	71	303	164	114	93	42	36	46	38
29	49	31	89	86			89	31	63	56	90	51	109	89	109	63	490	193	84	51	42	36	46	46
30	49	31	98	80			36	31	63	56	59	51	109	80	80	71	526	262	59	51	156	42	54	39
31	49	31	89	80			42	36			59	51			98	71	565	348			49	42		
Mean	37	33	67	57	72	61	51	36	55	42	63	53	85	70	134	96	237	132	342	229	79	43	58	43
Max	63	42	98	89	98	89	89	42	98	56	96	59	126	114	234	156	565	348	700	399	234	140	166	56
Min	31	31	36	36	56	49	36	30	36	28	51	49	51	51	80	56	119	63	59	51	42	36	36	31

Table 19. Daily mean dissolved-oxygen concentration, Delaware River at Benjamin Franklin Bridge at Philadelphia, Pennsylvania (station number 01467200), April 1 to November 30, 2007.
(U.S. Geological Survey published record)

[Concentrations in milligrams per liter; Max, maximum value; Min, minimum value; --, missing data]

DAY	APR	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV
1	11.1	9.0	4.9	5.2	4.6	--	6.0	8.5
2	11.2	8.9	5.0	5.3	4.6	--	6.0	8.8
3	11.2	9.0	4.6	5.4	4.7	--	6.0	8.9
4	11.1	9.0	4.3	5.5	4.7	--	5.8	9.1
5	10.9	8.9	4.0	5.3	4.7	--	5.8	9.3
6	10.9	8.9	3.9	5.1	4.5	--	5.7	9.3
7	10.8	8.6	3.9	5.1	4.4	--	5.7	9.5
8	10.6	8.5	3.8	5.2	4.4	--	5.7	9.5
9	10.8	8.1	3.7	5.3	4.6	--	5.9	9.4
10	11.0	7.8	3.8	5.3	4.6	--	5.7	9.4
11	11.1	7.6	3.7	5.2	4.7	--	5.6	9.3
12	11.1	7.5	3.4	4.8	4.7	--	5.9	9.4
13	11.3	7.3	3.2	4.7	4.8	--	6.3	9.4
14	11.3	7.4	3.4	4.7	4.8	--	6.5	9.2
15	11.0	7.5	3.4	4.8	4.8	--	6.7	9.3
16	10.8	7.5	3.4	5.0	4.7	--	6.8	9.6
17	10.6	6.9	3.6	5.0	4.7	--	6.7	10.1
18	11.1	6.9	3.8	4.8	4.6	5.4	6.5	10.6
19	11.4	6.5	4.0	4.6	4.6	5.6	6.4	11.1
20	11.5	6.3	3.9	4.7	4.4	5.7	6.4	11.6
21	11.3	6.0	3.9	4.9	4.5	5.8	6.4	11.7
22	11.1	5.8	4.3	5.3	4.6	5.8	6.5	11.7
23	10.8	5.4	4.8	5.4	4.7	5.8	6.7	11.9
24	10.4	5.3	5.1	5.5	4.7	5.9	6.9	12.0
25	10.1	5.3	5.3	5.5	4.6	6.0	6.9	12.0
26	9.8	5.3	5.4	5.3	4.1	6.1	7.1	12.0
27	9.4	5.0	5.4	5.3	--	6.1	7.1	12.0
28	9.2	4.8	5.3	5.2	--	6.0	7.8	12.1
29	9.2	4.9	5.2	5.0	--	6.1	8.1	12.4
30	9.1	5.0	5.1	4.8	--	6.2	8.2	12.6
31		5.0		4.7	--		8.4	
Mean	10.7	7.0	4.2	5.1	4.6	5.9	6.5	10.4
Max	11.5	9.0	5.4	5.5	4.8	6.2	8.4	12.6
Min	9.1	4.8	3.2	4.6	4.1	5.4	5.6	8.5

Table 20. Daily mean dissolved-oxygen concentration, Delaware River at Chester, Pennsylvania (station number 01477050), April 1 to November 30, 2007.
(U.S. Geological Survey published record)

[Concentrations in milligrams per liter; Max, maximum value; Min, minimum value; --, missing data]

DAY	APR	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV
1	11.7	9.4	6.5	5.6	5.4	5.2	7.1	7.3
2	11.6	9.1	6.1	5.8	5.3	5.3	7.1	7.5
3	11.5	8.9	--	6.0	5.4	5.5	7.1	7.8
4	11.4	8.7	--	6.3	5.4	5.5	7.1	8.0
5	11.6	8.5	5.5	6.5	5.5	5.6	7.0	8.0
6	11.9	8.7	5.3	6.2	5.7	5.6	6.9	8.3
7	11.9	8.8	5.1	6.0	5.6	5.7	6.9	8.6
8	12.1	8.7	4.9	6.0	5.5	5.8	7.1	8.7
9	12.4	8.4	4.8	6.0	5.4	5.7	7.2	8.6
10	12.5	8.3	4.9	--	5.4	5.6	--	8.6
11	12.4	8.0	--	--	5.6	5.6	6.8	8.6
12	12.4	7.9	--	5.9	5.6	5.7	7.0	8.7
13	12.4	7.9	4.7	5.8	--	5.7	7.1	8.6
14	12.5	7.9	5.1	5.8	--	5.8	7.1	8.5
15	12.4	8.0	4.9	6.1	--	5.8	7.1	8.5
16	13.0	8.0	4.8	6.0	5.7	6.0	6.9	--
17	13.2	7.6	4.9	5.9	5.5	6.2	6.9	--
18	13.1	7.4	4.9	5.9	5.3	6.5	6.6	--
19	13.0	7.1	5.1	5.6	5.2	6.7	--	--
20	13.0	7.0	5.0	5.6	5.1	6.7	--	--
21	12.7	6.9	5.0	5.7	5.4	6.6	--	--
22	12.4	6.8	5.2	5.8	--	6.5	--	--
23	12.1	6.7	5.3	6.0	--	6.4	--	--
24	11.7	6.8	5.5	6.2	--	6.5	--	--
25	11.4	6.8	5.7	6.2	--	6.6	--	9.5
26	11.1	6.8	5.7	6.0	--	6.6	--	9.6
27	--	6.7	5.8	5.8	--	6.6	--	9.8
28	--	6.6	6.0	5.8	5.3	6.7	--	10.0
29	--	6.5	5.8	5.5	5.3	6.8	--	10.1
30	--	6.7	5.6	5.5	5.3	6.9	7.2	10.4
31		6.6		5.4	5.2		7.2	
Mean	12.2	7.7	5.3	5.9	5.4	6.1	7.0	8.7
Max	13.2	9.4	6.5	6.5	5.7	6.9	7.2	10.4
Min	11.1	6.5	4.7	5.4	5.1	5.2	6.6	7.3

Appendix A

Temporary Spill Mitigation Program
for
Neversink, Pepacton, and Cannonsville Reservoirs

On April 21, 2004, the Parties to the 1954 U.S. Supreme Court Decree (Decree Parties) approved an interim program for managing releases from the New York City Neversink, Pepacton and Cannonsville Reservoirs (NYC Delaware Basin Reservoirs). That interim program was embodied in Delaware River Basin Commission (DRBC) Resolution No. 2004-3 Docket No. D-77-20 (Revision 7). In approving that resolution, the Decree Parties committed to continuing discussions to develop and implement by May 31, 2007 a long-term flexible program to manage releases from the NYC Delaware Basin Reservoirs to better address fisheries in the tailwaters below those reservoirs; the Decree Parties agreed that implementation of such a program required consideration of other related issues.

The Decree Parties agree that reduction of spill volumes from the NYC Delaware Basin Reservoirs during flood events is a related issue that should be considered in the development of the long-term flexible program. The Decree Parties also agree that reduction of NYC Delaware Basin Reservoir spill volumes should not be delayed until final approval of a long-term flexible program occurs, and hereby agree to implement a temporary spill mitigation program through May 31, 2007.

During above normal hydrologic conditions that result in full or nearly full storage in the NYC Delaware Basin Reservoirs, the temporary spill mitigation program described below will be implemented to reduce the volume of water spilled from these reservoirs. The program will attempt to limit excess spillage through supplemental releases from the NYC Delaware Basin Reservoirs. The program shall be in effect through May 31, 2007. This temporary program is not part of any regular release program and does not establish a precedent for any future releases or actions.

Although the total volume of water spilled from the NYC Delaware Basin Reservoirs may be reduced by this temporary program, it is unlikely that peak flows downstream of these reservoirs will be significantly further reduced. The NYC Delaware Basin Reservoirs provide substantial attenuation of peak flows downstream even when one or more of the reservoirs are spilling. The reservoirs were not designed as flood control reservoirs and do not contain release works capable of releasing water at rates necessary for effective flood management operation; consequently, the Decree Parties continue to strongly urge communities downstream of the reservoirs to take all necessary and prudent actions to improve flood preparedness and increase awareness of flood potential.

Temporary Reservoir Spill Mitigation Program:

1. Upon approval of this agreement by the Decree Parties, NYC will implement a temporary program to achieve limited reduction of NYC Delaware Basin Reservoir spills through supplemental releases.
2. For the period ending May 31, 2007, whenever the usable storage in the NYC Delaware Basin Reservoirs is above the 80% rule curve as shown in Figure 1. in lieu of the releases otherwise required under Docket D-77-20 (Revision 7), supplemental releases from the NYC Delaware Basin Reservoirs will be made in accordance with the individual rule curves shown on Figure 2 and at rates as shown in Table 1. In order to provide for such releases, it is agreed that the operational assumptions used for modeling analyses and stipulated in paragraph 3 will apply throughout the period this program remains in effect.
3. The releases under this program have been modeled using the OASIS model and are based upon an operational assumption of a running daily average diversion by the City of not more than 610 mgd, combined, from the NYC Delaware Basin Reservoirs. The habitat flow targets, in accordance with Revision 7, continue to apply when storage is above the 80% rule curve.

Figure 1

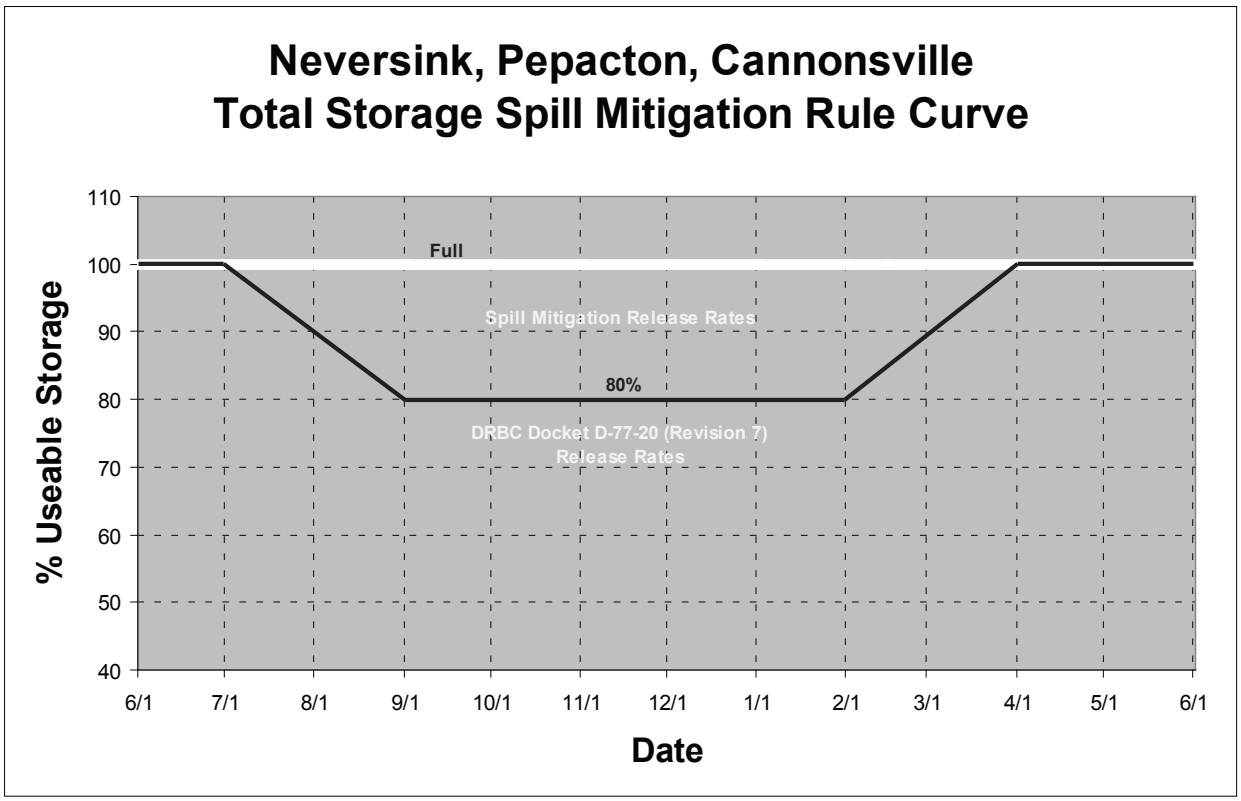

Figure 2

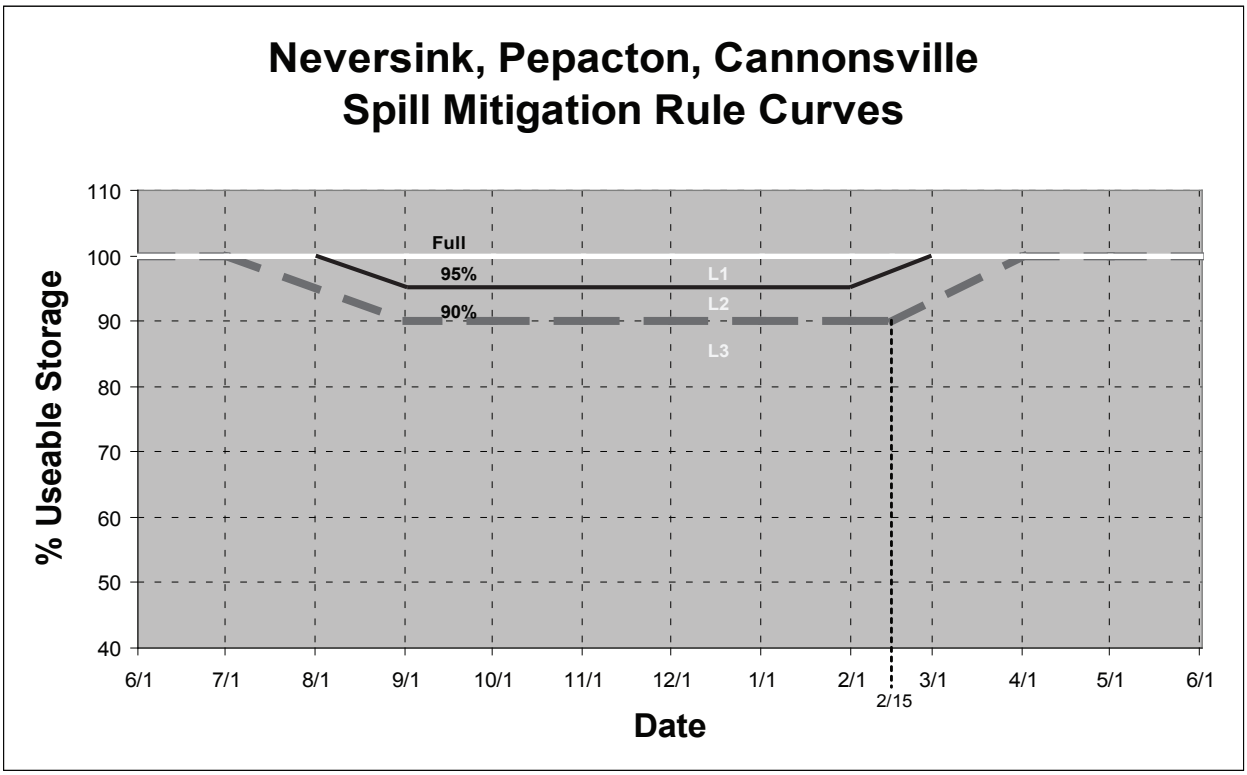

Table 1

Release Level	Release Rates (cfs)					
	Spring/Fall			Winter		
	Cannonsville	Pepacton	Neversink	Cannonsville	Pepacton	Neversink
L1	1000	700	190	1000	700	190
L2	275	200	85	250	185	85
L3	140	100	75	110	85	65

Spring/Fall:	May 1–May 31 and Sept. 15–Sept. 30
Winter:	October 1–April 30

4. Controlled reservoir releases will be made in accordance with the following:

   i. The flood stage for the West Branch Delaware River at Hale Eddy is 11 feet. Accordingly, supplemental releases from Cannonsville Reservoir will not be made when the river stage for the West Branch Delaware River at Hale Eddy is above 9 feet, or is forecasted to be above 9 feet within 48 hours of a planned supplemental release from Cannonsville Reservoir. This guidance may be modified at any time if additional information demonstrates that a lower cautionary stage should be used to limit the supplemental releases.

   ii. The flood stage for the East Branch Delaware River at Fishs Eddy is 13 ft. Accordingly, supplemental releases will not be made when the river stage for the East Branch Delaware River at Fishs Eddy is above 11 ft. or is forecast to be above 11 ft. within 48 hours of a planned supplemental release from Pepacton Reservoir. This guidance may be modified at any time if additional information demonstrates that a lower cautionary stage should be used to limit the supplemental releases.

   iii. The flood stage for the Neversink River at Bridgeville is 13 feet. Accordingly, supplemental releases will not be made when the river stage for the Neversink River at Bridgeville is above 12 feet, or is forecast to be above 12 feet within 48 hours of a planned supplemental release from Neversink Reservoir. This guidance may be modified at any time if additional information demonstrates that a lower cautionary stage should be used to limit the supplemental releases.

   iv. Supplemental releases may be suspended from the respective reservoir if ice conditions threaten flood prone areas of the Neversink River below Neversink Reservoir, East Branch Delaware River below Pepacton Reservoir, or West Branch Delaware River below Cannonsville Reservoir.

   v. Supplemental releases will be designed so that the combined discharge from the reservoirs and their respective spillways do not exceed flow rates as detailed in Table 2 below. All controlled releases will be reduced to the conservation releases in Table 3 when the spillway discharge exceeds these flow rates.

   vi. To more naturally effect downward transitions between release levels identified in Figures 1 and 2 and Table 1, supplemental release rates shall be ramped generally over a three-day period at Cannonsville and Pepacton Reservoirs and a two-day period at Neversink Reservoir, but in increments no less than 10 cfs at any reservoir.

Table 2

Reservoir	Maximum Combined Spill/ Release Flow Rate
Neversink	3400 cfs
Pepacton	2400 cfs
Cannonsville	4200 cfs

Table 3. Conservation Releases

	Conservation Release (cfs)			
Reservoir	***Normal***	***Drought Watch***	***Drought Warning***	***Drought***
Cannonsville (9/1-5/31)	45	38	32	23
Cannonsville (6/1-8/31)	60	51	43	23
Pepacton	35	30	25	19
Neversink	25	21	18	15

5. For the period ending May 31, 2007, whenever the total storage in the NYC Delaware Basin Reservoirs is below the applicable point on the 80% rule curve as shown in Figure 1, releases from the NYC Delaware Basin Reservoirs will be made and accounted for in accordance with DRBC Docket D-77-20 (Revision 7).
6. For the period ending May 31, 2007, whenever the total storage in the NYC Delaware Basin Reservoirs is above the applicable point on the 80% rule curve as shown in Figure 1 and supplemental releases are made in accordance with this spill mitigation program, to the extent necessary, habitat releases may be made to meet the habitat flow targets in accordance with DRBC Docket D-77-20 (Revision 7). There shall be no credits or debits to the 'Habitat Protection Bank' as established in Revision 7 including without limitation to the Excess Release Quantity Bank portion of the Habitat Protection Bank provided from the Excess Release Quantity.
7. The "Rainfall Event Based Temporary Spill Reduction Program for Pepacton Reservoir" effective February 8, 2006 and "Rainfall Event Based Temporary Spill Reduction Program for Neversink Reservoir" effective February 8, 2006 are hereby suspended for the effective period of this agreement.
8. The "Interim Program for Neversink Reservoir Spill Reduction" effective November 1, 2005 and the "Interim Program for Pepacton Reservoir Spill Reduction" effective November 1, 2005 are hereby suspended for the effective period of this agreement.
9. A quantity of water no greater than 50% of the water equivalent of snow pack storage in the watershed above each reservoir will be included in the storage calculation to determine the reservoir release levels in Figure 2 and Table 1.
10. This agreement will expire on May 31, 2007 and may be terminated at any time at the request of any Decree Party or may be modified with the unanimous consent of the Decree Parties.

Consent to Action by The City of New York

Consent of the Parties to the U.S. Supreme Court Decree in New Jersey v. New York, 347 U.S. 995 (1954), approving the Temporary Spill Mitigation Program for Neversink, Pepacton and Cannonsville Reservoirs, January 3, 2007 through May 31, 2007, implemented by the City of New York.

/s/ Mark N. Mauriello
State of New Jersey Date

/s/ Mark Klotz
State of New York Date

/s/ Kevin C. Donnelly
State of Delaware Date

/s/ Cathy Curran Myers
Commonwealth of Pennsylvania Date

/s/ John H. Talley
State of Delaware Date

/s/ Paul Rush
City of New York Date

Appendix B

Temporary Spill Mitigation Program
for
Neversink, Pepacton, and Cannonsville Reservoirs

June 1, 2007 – September 26, 2007

On April 21, 2004, the Parties to the 1954 U.S. Supreme Court Decree (Decree Parties) approved an interim program for managing releases from the New York City Neversink, Pepacton and Cannonsville Reservoirs (NYC Delaware Basin Reservoirs). That interim program was embodied in Delaware River Basin Commission (DRBC) Resolution No. 2004-3 Docket No. D-77-20 (Revision 7). In approving that resolution, the Decree Parties committed to continuing discussions to develop and implement a long-term flexible program to manage releases from the NYC Delaware Basin Reservoirs to better address fisheries in the tailwaters below those reservoirs; the Decree Parties agreed that implementation of such a program required consideration of other related issues.

The Decree Parties agree that reduction of spill volumes from the NYC Delaware Basin Reservoirs during flood events is a related issue that should be considered in the development of the long-term flexible program. The Decree Parties also agree that reduction of NYC Delaware Basin Reservoir spill volumes should not be delayed until final approval of a long-term flexible program occurs, and hereby agree to implement a temporary spill mitigation program through September 26, 2007.

During above normal hydrologic conditions that result in full or nearly full storage in the NYC Delaware Basin Reservoirs, the temporary spill mitigation program described below will be implemented to reduce the volume of water spilled from these reservoirs. The program will attempt to limit excess spillage through spill mitigation releases from the NYC Delaware Basin Reservoirs. The program is not designed to achieve any specific void volumes in the reservoirs; rather, it provides for significantly increased releases during periods of high storage in order to reduce combined usable storage and the occurrence and duration of spills to the extent practicable. The program shall be in effect through September 26, 2007. This temporary program is not part of any regular release program and does not establish a precedent for any future releases or actions.

Although the total volume of water spilled from the NYC Delaware Basin Reservoirs may be reduced by this temporary program, it is unlikely that peak flows downstream of these reservoirs will be significantly further reduced. The NYC Delaware Basin Reservoirs provide substantial attenuation of peak flows downstream even when one or more of the reservoirs are spilling. The reservoirs were not designed as flood control reservoirs and do not contain release works capable of releasing water at rates necessary for effective flood management operation; consequently, the Decree Parties continue to strongly urge communities downstream of the reservoirs to take all necessary and prudent actions to improve flood preparedness and increase awareness of flood potential.

Temporary Reservoir Spill Mitigation Program:

1. Upon approval of this agreement by the Decree Parties, NYC will implement a temporary program to achieve limited reduction of NYC Delaware Basin Reservoir spills through spill mitigation releases.

2. For the period ending September 26, 2007, whenever the combined reservoir usable storage in the NYC Delaware Basin Reservoirs is in the Spill Mitigation Release Zone as shown in Figure 1, in lieu of the releases otherwise required under Docket D-77-20 (Revision 7), spill mitigation releases from the NYC Delaware Basin Reservoirs will be made in accordance with the individual rule curves shown on Figure 2 and at rates as shown in Table 1. In order to provide for such releases, it is agreed that the operational assumptions used for previous modeling analyses and stipulated in paragraph 3 will apply throughout the period this program remains in effect.

3. The releases under this program are based upon an operational assumption of a running daily average diversion by the City of not more than 610 mgd, combined, from the NYC Delaware Basin Reservoirs. The habitat flow targets, in accordance with Revision 7, continue to apply when combined reservoir usable storage is in the Spill Mitigation Release Zone.

Figure 1

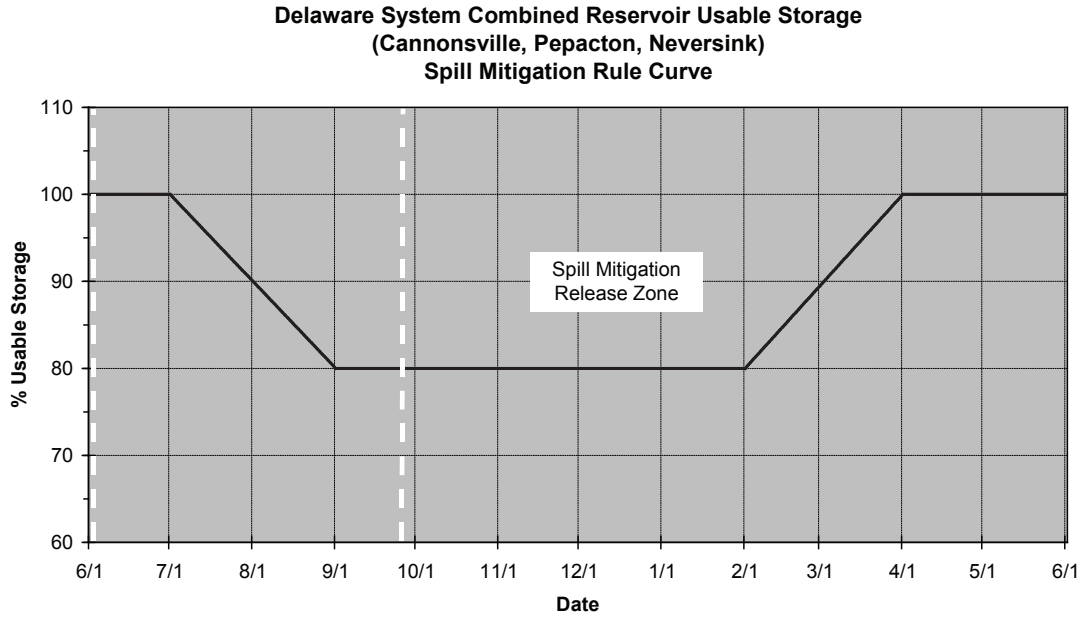

Figure 2

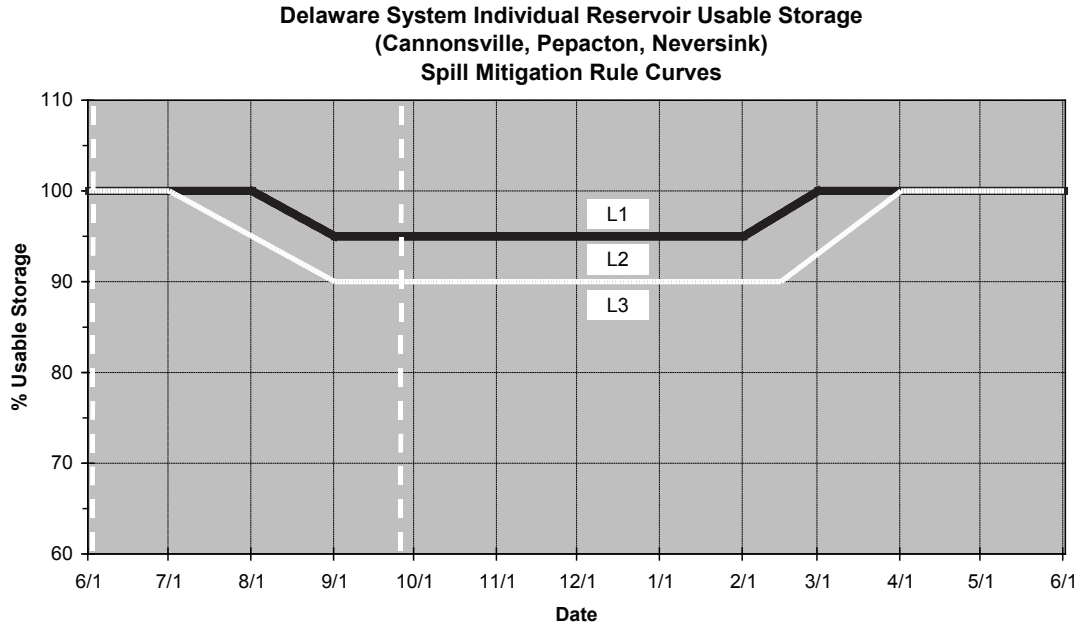

Table 1

Cannonsville	Release Rates (cfs)				
Release Level	**Oct 1 - Mar 31**	**Apr 1 - Apr 30**	**May 1 - May 31**	**Jun 1 - Jun 30**	**Jul 1 - Sep 30**
L1	1000	1000	---	---	100
L2	250	---	---	---	350
L3	110	---	140	235	235
Pepacton	**Release Rates (cfs)**				
Release Level	**Oct 1 - Mar 31**	**Apr 1 - Apr 30**	**May 1 - May 31**	**Jun 1 - Jun 30**	**Jul 1 - Sep 30**
L1	700	700	---	---	700
L2	185	---	---	---	250
L3	85	---	100	150	150
Neversink	**Release Rates (cfs)**				
Release Level	**Oct 1 - Mar 31**	**Apr 1 - Apr 30**	**May 1 - May 31**	**Jun 1 - Jun 30**	**Jul 1 - Sep 30**
L1	190	190	---	---	190
L2	85	---	---	---	130
L3	65	---	75	115	115

4. Controlled reservoir releases will be made in accordance with the following:

   i. For the period June 1 through June 30, Zones L1 and L2 shall not be applicable in accordance with Figure 2, and releases shall be made in accordance with Zone L3 as provided in Figure 2 and Table 1. Except as provided in paragraph viii, for the period June 1 through June 30, no spill mitigation releases shall be made.

   ii. For the period July 1 through March 31, if combined reservoir usable storage is in the Spill Mitigation Release Zone in accordance with Figure 1, spill mitigation releases shall be made based upon individual reservoir usable storage in accordance with Zones L1, L2 and L3 as provided in Figure 2 and Table 1.

   iii. For the period April 1 through April 30, if combined reservoir usable storage including snow pack as provided in paragraph iv is in excess of 100%, spill mitigation releases shall be made based upon individual reservoir usable storage in accordance with Zone L1 as provided in Figure 2 and Table 1.

   iv. During the period October 1 through April 30, a quantity of water equal to 50% of the water equivalent of snow pack storage in the watershed above each reservoir will be included in the storage calculation to determine the applicable combined reservoir usable storage zone in Figure 1 and the applicable respective reservoir usable storage zone in Figure 2 and Table 1.

   v. For the period May 1 through May 31, Zones L1 and L2 shall not be applicable in accordance with Figure 2, and releases shall be made in accordance with Zone L3 as provided in Figure 2 and Table 1. Except as provided in paragraph viii, for the period May 1 through May 31, no spill mitigation releases shall be made.

   vi. For the period ending May 31, whenever the combined reservoir usable storage in the NYC Delaware Basin Reservoirs is below the Spill Mitigation Release Zone as shown in Figure 1, releases from the NYC Delaware Basin Reservoirs will be made and accounted for in accordance with DRBC Docket D-77-20 (Revision 7).

vii. For the period ending May 31, whenever the combined reservoir usable storage in the NYC Delaware Basin Reservoirs is in the Spill Mitigation Release Zone as shown in Figure 1 and spill mitigation releases are made in accordance with this spill mitigation program, to the extent necessary, habitat releases may be made to meet the habitat flow targets in accordance with DRBC Docket D-77-20 (Revision 7). There shall be no credits or debits to the Habitat Protection Bank as established in Revision 7 including without limitation to the Excess Release Quantity Bank portion of the Habitat Protection Bank provided from the Excess Release Quantity.

viii. At all times, if individual reservoir usable storage exceeds 100% at any reservoir, the NYCDEP and NYSDEC release managers may transfer up to 100% of spills at that reservoir to bottom releases to the extent possible as mutually agreed upon.

ix. The flood stage for the West Branch Delaware River at Hale Eddy is 11 feet. Accordingly, spill mitigation releases will not be made from Cannonsville Reservoir when the river stage for the West Branch Delaware River at Hale Eddy is above 9 feet, or is forecasted to be above 9 feet within 48 hours of a planned spill mitigation release from Cannonsville Reservoir. This guidance may be modified at any time if additional information demonstrates that a lower cautionary stage should be used to limit the spill mitigation releases.

x. The flood stage for the East Branch Delaware River at Fishs Eddy is 13 ft. Accordingly, spill mitigation releases will not be made from Pepacton Reservoir when the river stage for the East Branch Delaware River at Fishs Eddy is above 11 ft. or is forecast to be above 11 feet within 48 hours of a planned spill mitigation release from Pepacton Reservoir. This guidance may be modified at any time if additional information demonstrates that a lower cautionary stage should be used to limit the spill mitigation releases.

xi. The flood stage for the Neversink River at Bridgeville is 13 feet. Accordingly, spill mitigation releases will not be made from Neversink Reservoir when the river stage for the Neversink River at Bridgeville is above 12 feet, or is forecast to be above 12 feet within 48 hours of a planned spill mitigation release from Neversink Reservoir. This guidance may be modified at any time if additional information demonstrates that a lower cautionary stage should be used to limit the spill mitigation releases.

xii. Spill mitigation releases may be suspended from the respective reservoir if NYCDEP and NYSDEC in consultation with the National Weather Service determine that ice conditions threaten flood prone areas of the Neversink River below Neversink Reservoir, East Branch Delaware River below Pepacton Reservoir, or West Branch Delaware River below Cannonsville Reservoir.

xiii. Spill mitigation releases may also be suspended from the respective reservoir if the local, state and federal emergency management agencies recommend a need to temporarily suspend such releases.

xiv. Spill mitigation releases will be designed so that the combined discharge from each reservoir's controlled release works and spillway does not exceed the flow rate as detailed in Table 2 below. Respective controlled releases will be reduced to the conservation releases in Table 3 when the spillway discharge exceeds these flow rates.

xv. To more naturally effect downward transitions between spill mitigation release rates identified in Figures 1 and 2 and Table 1, spill mitigation release rates may be ramped generally over a period not to exceed three days at Cannonsville and Pepacton Reservoirs and not to exceed two days at Neversink Reservoir, but in increments no less than 10 cfs at any reservoir.

Table 2

Reservoir	Maximum Combined Spill/Release Flow Rate
Neversink	3400 cfs
Pepacton	2400 cfs
Cannonsville	4200 cfs

Table 3. Conservation Releases

	Conservation Release (cfs)			
Reservoir	***Normal***	***Drought Watch***	***Drought Warning***	***Drought***
Cannonsville (9/1-5/31)	45	38	32	23
Cannonsville (6/1-8/31)	60	51	43	23
Pepacton	35	30	25	19
Neversink	25	21	18	15

5. This agreement will expire on September 26, 2007 and may be terminated at any time at the request of any Decree Party or may be modified with the unanimous consent of the Decree Parties.

Consent to Action by The City of New York

Consent of the Parties to the U.S. Supreme Court Decree in New Jersey v. New York, 347 U.S. 995 (1954), approving the Temporary Spill Mitigation Program for Neversink, Pepacton and Cannonsville Reservoirs from June 1, 2007 through September 26, 2007, implemented by the City of New York.

/s/ Mark N. Mauriello
State of New Jersey Date

/s/ Mark Klotz
State of New York Date

/s/ Kevin C. Donnelly
State of Delaware Date

/s/ Cathy Curran Myers
Commonwealth of Pennsylvania Date

/s/ John H. Talley
State of Delaware Date

/s/ Paul Rush
City of New York Date

Appendix C

NO. 2007 – 7

A RESOLUTION to extend Revisions 7 and 9 of Docket D-77-20 CP, providing for, respectively, a program to manage releases from New York City's Neversink, Pepacton and Cannonsville reservoirs for the protection of fisheries, and a program to reduce the volume of spills from these reservoirs during floods.

WHEREAS, by Resolution No. 2004-3 in April of 2004, the Commission established a temporary release program known as "Revision 7"for the Neversink, Pepacton and Cannonsville reservoirs (hereinafter, "the City Delaware Reservoirs"), intended to protect the tailwaters fishery below these reservoirs for the period from May 1, 2004 through May 31, 2007; and

WHEREAS, by Resolution No. 2006-18 in September of 2006, the Commission established a program known as "Revision 9" to take effect from the date of its adoption through May 31, 2007 to reduce the volume of spills from the City Delaware Reservoirs during flood events; and

WHEREAS, Revisions 7 and 9 both were established with the understanding set forth in Resolution No. 2004-3 that the parties to the U.S. Supreme Court Decree of 1954 ("Decree Parties") would continue discussions to develop and implement by May 31, 2007 a long-term flexible program to manage releases from the City Delaware Reservoirs to better address multiple flow needs downstream; and

WHEREAS, between February 12 and March 1 of 2007, the Commission published in the federal and state registers and on its website notice that it would hold public hearings and accept written comments on a proposal by the Decree Parties for a Flexible Flow Management Plan (FFMP) that would provide a comprehensive framework for addressing multiple flow management objectives, including water supply, drought mitigation, flood mitigation, protection of the tailwaters fishery, a diverse array of habitat needs in the main stem, estuary and bay, recreational goals and salinity repulsion; and

WHEREAS, in response to its notice, the Commission received written and oral comments from approximately 140 agencies, organizations, elected officials and private citizens, including many substantive recommendations for enhancing the FFMP with respect to its multiple flow objectives; and

WHEREAS, in the course of the Decree Parties'continued negotiations over details of the FFMP, additional issues requiring negotiation arose, including a request by New Jersey for reexamination of the Commission's current drought operations plan, in order to better address water supply and flood mitigation needs throughout the basin; and

WHEREAS, the Decree Parties require additional time to review and fully consider the comments submitted by the public, to explore ways to accommodate New Jersey's request, and to craft a revised Flexible Flow Management Plan that attempts to better respond to competing needs; and

WHEREAS, the Commission's public notice announcing a comment period and hearings on the FFMP also invited the public to comment on alternative reservoir management strategies that might be adopted in the event that consensus on the FFMP were not reached. The notice stated that the alternative options to be considered were extending the current reservoir release program or reinstating a previous reservoir release program, and the notice further advised that either option would be considered in combination with a seasonal spill mitigation program or an annual spill mitigation program for the three City Delaware Reservoirs; and

WHEREAS, notwithstanding the shortcomings of the current fishery protection program known as Revision 7, the Decree Parties and the Commission find that this plan affords greater benefits than previous flow management regimes during the summer months, and wishes to secure these benefits for the approaching season; and

WHEREAS, because the spill mitigation program set forth in Revision 9 was to be in place only from late September of 2006 through May of 2007 before being replaced by a more comprehensive program, Table 1 of Revision 9 does not include summer release rates to accompany the rule curves provided in Figures 1 and 2 of Revision 9; however, the rule curves establish that spill mitigation releases are to be made during the months of July through September when reservoir levels reach or exceed the useable storage levels established by the curves; and

WHEREAS, with the technical and administrative support of the Commission, the Decree Parties continue to evaluate their options for addressing the competing demands on the finite waters of the Delaware and intend to advance a revised FFMP proposal that is responsive to public comment, the evolving needs of the respective parties and the rights and obligations conferred by the Supreme Court Decree of 1954; now therefore,

BE IT RESOLVED by the Delaware River Basin Commission:

1. The releases program known as Revision 7 of Docket D-77-20 CP, which was established by Resolution No. 2004-3 to provide protection for fisheries below the City Delaware Reservoirs, is hereby extended through September 30, 2007.
2. The releases program known as Revision 9 of Docket D-77-20 CP, which was established by Resolution No. 2006-18 to reduce the volume of spills from the City Delaware Reservoirs during flood events, is hereby extended (as amended by Resolution No. 2007-1) through September 30, 2007.
3. The parties to the Supreme Court Decree of 1954 are hereby authorized and requested to agree prior to July 1, 2007 upon appropriate reservoir spill mitigation release rates for the City Delaware Reservoirs to be implemented for the period from July 1 through September 14 consistent with the spill mitigation rule curves that appear in Figures 1 and 2 of Revision 9, provided that in the absence of public notice and a hearing before the Commission, such release rates shall not exceed the maximum rates of 1000 cubic feet per second (cfs) for Cannonsville, 700 cfs for Pepacton, and 190 cfs for Neversink set forth in Table 1 of Revision 9. The release rates agreed upon by the Decree Parties will be posted on the Commission's website as soon as they become available.
4. Public notice, the opportunity for further written comment and a public hearing will be provided prior to Commission action on a revised Flexible Flow Management Plan, when such a plan is submitted by the Decree Parties for the Commission's consideration.

/s/ William A. Gast
William A. Gast, Acting Chairman *pro tem*

/s/ Pamela M. Bush
Pamela M. Bush, Esquire, Commission Secretary

ADOPTED: May 10, 2007