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Report of the River Master of the Delaware River for the Period December 1, 2009–November 30, 2010

Open-File Report 2019–1093

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

Report of the River Master of the Delaware River for the Period December 1, 2009–November 30, 2010

By Kendra L. Russell, Darwin Ockerman, Bruce E. Krejmas, Gary N. Paulachok, and Robert R. Mason, Jr.

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

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Conversion Factors

U.S. customary units to International System of Units

Multiply	By	To obtain
	Length	
inch (in.)	2.54	centimeter (cm)
inch (in.)	25.4	millimeter (mm)
foot (ft)	0.3048	meter (m)
mile (mi)	1.609	kilometer (km)
	Area	
square mile (mi^2)	259.0	hectare (ha)
square mile (mi^2)	2.590	square kilometer (km^2)
	Volume	
million gallons (Mgal)	3,785	cubic meter (m^3)
billion gallons (Bgal)	3.785	cubic hectometers (hm^3)
cubic foot per second day ([ft^3/s]-d)	2,447	cubic meter (m^3)
acre-foot (acre-ft)	1,233	cubic meter (m^3)
acre-foot (acre-ft)	0.001233	cubic hectometer (hm^3)
	Flow rate	
cubic foot per second (ft^3/s)	0.02832	cubic meter per second (m^3/s)
million gallons per day (Mgal/d)	0.04381	cubic meter per second (m^3/s)

Temperature in degrees Celsius (°C) may be converted to degrees Fahrenheit (°F) as follows:

$$°F = (1.8 \times °C) + 32.$$

Datum

Vertical coordinate information is referenced to the Bureau of Water Supply (BWS) datum, which was established by the New York City Department of Environmental Protection, Bureau of Water Supply.

Horizontal coordinate information is referenced to the North American Datum of 1983 (NAD 83).

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

Supplemental Information

Specific conductance is given in microsiemens per centimeter at 25 degrees Celsius (µS/cm at 25 °C).

Concentrations of chemical constituents in water are given in milligrams per liter (mg/L).

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 24, 2019

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

The Honorable
John Carney
Governor of Delaware

The Honorable
Phil Murphy
Governor of New Jersey

The Honorable
Andrew M. Cuomo
Governor of New York

The Honorable
Tom Wolf
Governor of Pennsylvania

The Honorable
Bill de Blasio
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 57th Annual Report of the River Master of the Delaware River for the 12-month period from December 1, 2009, to November 30, 2010. In this report, this period is referred to as the River Master water year or the report year.

During the 2010 River Master report year, monthly precipitation in the upper Delaware River Basin ranged from 60 percent of the long-term average in September 2010 to 249 percent of the long-term average in October 2010. Precipitation from December to May, when reservoirs typically refill, was 21.96 inches. Precipitation was below normal in January, April, May, June, September, and November, and above normal in the other 6 months.

On December 1, 2009, when the report year began, combined useable storage in the New York City reservoirs in the upper Delaware River Basin was 240.016 billion gallons (Bgal) or 88.6 percent of combined storage capacity. Combined storage in Pepacton, Cannonsville, and Neversink Reservoirs remained high until August 2010. Reservoir storage decreased from August and rebounded in mid-October, then increased through the end of November. A lower basin drought warning was issued by the Delaware River Basin Commission (DRBC)

on September 24, 2010. It automatically ended on October 31, 2010, when reservoir contents exceeded drought levels for 15 days, due in large part to heavy rainfall during the last week of September. During the report year, operations in the basin were conducted as stipulated by the Decree and the 2008 Flexible Flow Management Program (FFMP).

On May 26, 2010, the Delaware River Master Advisory Committee (Advisory Committee) met at the Embassy Suites Hotel in Parsippany, New Jersey, to discuss the issues related to the suspension of the Decree Party Work Group meetings and develop an agreed upon strategy to move forward with the current FFMP or a modified version. During the report year, the following individuals served as members of the Advisory Committee:

Delaware	John H. Talley
New Jersey	John Plonski
New York	Mark Klotz
New York City	Paul Rush
Pennsylvania	John Hines

During the report year, the River Master and staff participated in a number of water-supply-related meetings of the Delaware River Basin Commission (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. In addition to management of reservoir releases and streamflow in the upper Delaware River Basin, an issue of particular interest to the River Master was the impending expiration of the current FFMP on June 1, 2011.

During the year, River Master operations were executed through the U.S. Geological Survey (USGS) Office of the Delaware River Master located 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 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 are available through the Office of the Delaware River Master website (https://webapps.usgs.gov/odrm/data_archive.html).

The first section of this report documents Delaware River operations during the report year. During the year, the City of New York diverted 199.514 Bgal from the Delaware River Basin and released 226.322 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 47.74 Bgal. The second section of this report describes water quality at various monitoring 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 and Alliance Energy in informing the River Master of plans for power generation and furnishing data on reservoir releases and elevations are greatly appreciated.

Sincerely yours,

/Signed/

Robert R. Mason, Jr., P.E.
Delaware River Master

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 streamflow of the Delaware River at Montague, New Jersey, by the U.S. Geological Survey (USGS) New Jersey Water Science Center (WSC) and for other locations and tributaries by the USGS New York and Pennsylvania WSCs; for Pepacton, Cannonsville, and Neversink Reservoirs by the New York City Department of Environmental Protection (DEP), Bureau of Water Supply; for Lake Wallenpaupack by the PPL Corporation; and for Rio Reservoir by Alliance Energy. Quantitative precipitation forecasts and some precipitation data were provided by the National Weather Service office in Binghamton, New York.

Arthur Lillenthal, Marie Owens, Margaret Philips, and Vincent DiFrenna, all of the USGS, assisted and contributed to this report by collecting, organizing, and reviewing data. Amy Shallcross, Delaware River Basin Commission, and Jennifer Garigliano, New York City DEP, provided information regarding 2010 activities, including the lower basin drought warning, Interim Excess Release Quantity usage, and New York City DEP maintenance schedule.

Report of the River Master of the Delaware River for the Period December 1, 2009–November 30, 2010

By Kendra L. Russell, Darwin Ockerman, Bruce E. Krejmas, Gary N. Paulachok, and Robert R. Mason, Jr.

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. In addition, the Decree authorizes diversion 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 57th Annual Report of the River Master of the Delaware River. It covers the 2010 River Master report year, the period from December 1, 2009, to November 30, 2010.

During the report year, precipitation in the upper Delaware River Basin was 49.38 inches or 112 percent of the long-term average. Combined storage in Pepacton, Cannonsville, and Neversink Reservoirs remained high much of the year and did not decline below 80 percent of combined capacity until September 2010. A lower basin drought warning was issued by the Delaware River Basin Commission on September 24, 2010. It automatically ended on October 31, 2010, when the reservoir contents rose above drought levels, due in large part to heavy rainfall during the last week of September. River Master operations during the year were conducted as stipulated by the Decree and the Flexible Flow Management Program.

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 81 days during the report year. Interim Excess Release Quantity and conservation releases, designed to relieve thermal stress and protect the fishery and aquatic habitat in the tailwaters of the reservoirs, were made during the report year.

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.

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 U.S. customary 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 calls for more water to be released when previous directed releases (or lack of releases) were insufficient to meet the Montague flow objective. It calls for less water to be released when previous directed releases were higher than required 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 useable volume in a reservoir between the point of maximum depletion and the elevation of the lower 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 are defined as follows:

  - **L1**—Discharge Mitigation Releases are releases designed to help mitigate the effects of spilling immediately below the Delaware Basin reservoirs. New York City shall make such controlled releases from the Delaware Basin reservoirs in accordance with figures 1 and 2 and table 3 in the Flexible Flow Management Program (FFMP). Three zones of reservoir-specific storage (L1-a, L1-b, and L1-c) are defined relative to two rule curves for each reservoir.
  - **Normal**—Conservation releases when New York City combined reservoir storage is in the normal (L2) storage zone.
  - **Watch**—Conservation releases when New York City combined reservoir storage is in the drought watch (L3) storage zone.
  - **Warning**—Conservation releases when New York City combined reservoir storage is in the drought warning (L4) storage zone.
  - **Drought**—Conservation releases when New York City combined reservoir storage is in the drought (L5) storage zone (also referred to as Drought Emergency).
- **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 billion gallons (Bgal). Each year, the seasonal period for release of the excess quantity begins on June 15.
- **Flexible Flow Management Program**—A set of rules for the management of storage, diversions, releases, and flow targets relating to the apportioning of water from the Delaware River Basin under the 1954 U.S. Supreme Court Decree (available at https://webapps.usgs.gov/odrm/decree.html) and unanimously agreed to by the Decree Parties. The Flexible Flow Management Program (FFMP) differed from the interim fishery releases program (Delaware River Basin Commission [DRBC] Docket D-77-20 CP [Revision 7]) and the temporary spill mitigation program (DRBC Docket D-77-20 CP [Revision 9]). The FFMP also differed from certain provisions of the DRBC Water Code relating to the Montague, New Jersey, flow target and the New Jersey diversion during DRBC drought operations.
- **Index gaging stations**—Specific 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 help estimate inflows of surface water to the upper Delaware River.
- I**nterim Excess Release Quantity**—An Interim Excess Release Quantity (IERQ) was defined in the FFMP and made available for an interim period from October 1, 2007, to May 31, 2011. The IERQ is computed as 83 percent of the difference between the highest year's consumption of the New York City water-supply system during the period 2002–2006—1,257 Mgal/d—and New York City's current estimate of continuous safe yield of the New York City water-supply system of 1,290 Mgal/d, obtainable without pumping. During the 2010 report year, the IERQ available for release was 15,468 cubic feet per second-day (ft^3/s)-d. New York City shall release the IERQ provided for above at rates designed to increase the flow at Montague from 1,750 cubic feet per second (ft^3/s) to 1,850 ft^3/s for the period commencing on June 15 and continuing through September 15, and to maintain a flow at Trenton of 3,000 ft^3/s during basin-wide normal conditions for the period commencing on June 15 and continuing through March 15, referred to as the "seasonal-period." The IERQ required to be released in any seasonal period shall in no event exceed 70 Bgal.
- **Interim excess release quantity extraordinary needs bank**—In addition to the hydrologic criteria described in Section 2.5.6 A. of the Delaware River Basin Water Code and subject to other provisional uses of the IERQ as provided in the FFMP, including Section 6.b, the Decree Parties, the DRBC, and the Delaware River Master may at any time review extraordinary water needs to support such research, aquatic life, or other water-use activity as may be approved by the DRBC. Upon unanimous agreement, the Decree Parties may bank all or a portion of the IERQ remain-

ing at such time, and such portion shall be placed in an "IERQ Extraordinary Needs Bank" and used to provide for such extraordinary water needs. Such banked quantity shall be deducted from the IERQ.

- **Key gaging stations**—Specific sites on the East Branch Delaware River, West Branch Delaware River, Neversink River, Delaware and Raritan Canal, and mainstem Delaware River where continuous, systematic observation 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 where a reservoir ceases to continue making delivery of quantities of water for all purposes for which the reservoir was designed. This is also 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.
- **Salt front**—The salt front is defined as the 250 parts-per-million isochlor, or line of equal chloride concentration, in the Delaware Estuary. One part per million is one part of solute (in this case, chloride) per one million parts of solvent (river water). The 7-day average location of the salt front is used as an indicator of salinity intrusion in the Delaware Estuary.
- **Storage or contents**—Useable volume of water in a reservoir. Unless otherwise indicated, volume is computed on the basis of the level of pool 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 14 and a 25-hour day on November 7.
- **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.

Introduction

An Amended Decree of the Supreme Court of the United States, entered June 7, 1954, (available at https://webapps.usgs.gov/odrm/decree.html) authorizes diversion of water from the Delaware River Basin and provides for releases of water from three New York City reservoirs—Pepacton, Cannonsville, and Neversink—to the upper Delaware River. The Decree stipulates that these diversions and releases are to be made under the supervision and direction of the Delaware River Master. The Decree also stipulates that reports on Delaware River operations be made to the Court not less frequently than annually; the reports can be accessed at https://webapps.usgs.gov/odrm/reports/reports.html.

This report documents operations from December 1, 2009, to November 30, 2010, or the 2010 River Master report year. This report also presents information on the quality of water in the Delaware Estuary during the report year.

Since 2007, the Decree Parties have unanimously approved a series of FFMP agreements (available at https://webapps.usgs.gov/odrm/ffmp/index.html) to manage the shared waters of the Delaware River Basin (appendix 1). On December 10, 2008, the Decree Parties (Delaware, New Jersey, New York, New York City, and Pennsylvania) signed an FFMP to guide the operations of the Office of the Delaware River Master (ODRM). The agreement is in effect until May 31, 2011 (appendix 2).

Some hydrologic data presented in this report are records of streamflow and water quality for U.S. Geological Survey (USGS) data-collection stations. These records were collected and computed by the offices of the USGS at Troy, New York; Exton, New Cumberland, and Milford, Pennsylvania; and Lawrenceville, 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 USGS streamflow-gaging stations, in the Delaware River Basin are shown in figure 1.

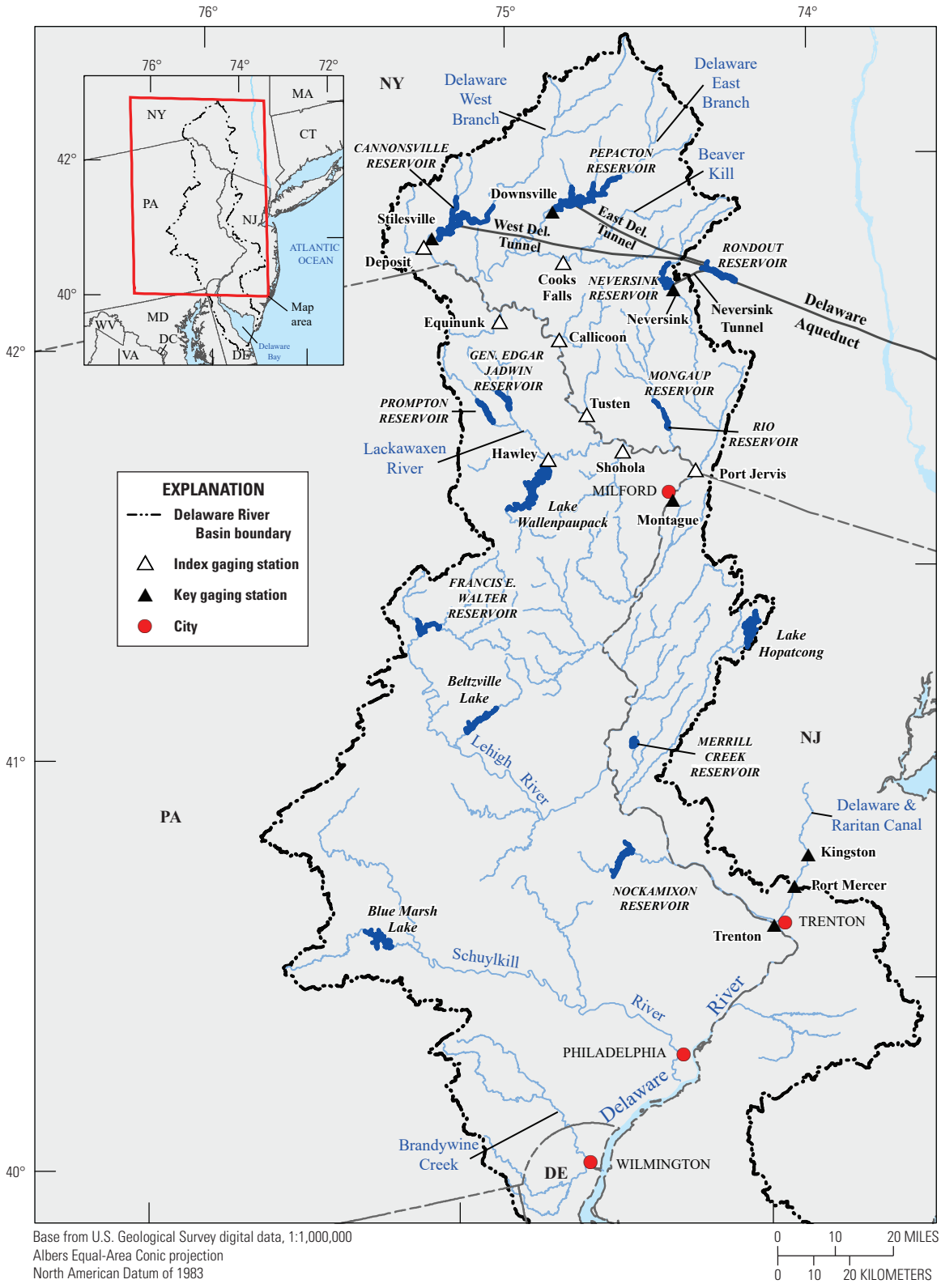

Figure 1. Map showing the Delaware River Basin upstream from Wilmington, Delaware.

Method to Determine Directed Releases from New York City Reservoirs

The data and computations of the various components of streamflow form the basic operational record used by the River Master to carry out specific responsibilities related to the Montague formula. The operational record has two parts: (1) segregating the streamflow components of the current daily mean discharge at the USGS streamflow gage at Montague, New Jersey (01438500), to compute the uncontrolled runoff and (2) forecasting the uncontrolled runoff and using forecasted information from other sources to predict the flow at Montague with adequate advance time to direct releases. The forecasting process is used to determine whether the River Master directs New York City reservoirs to release water to maintain the minimum flow targets at the USGS streamflow gage at Montague, New Jersey.

Segregating Streamflow Components, Delaware River at Montague, New Jersey

Segregation of streamflow at Montague involves determining the components of flow, including New York City reservoir releases, releases for generation of hydroelectric power, and uncontrolled runoff. For the segregation of the current flow, the following data are used:

1. Controlled releases from the Pepacton, Cannonsville, and Neversink Reservoirs of New York City.
2. Controlled releases from Lake Wallenpaupack on Wallenpaupack Creek for the production of hydroelectric power.
3. Controlled releases from Rio Reservoir on the Mongaup River for the production of hydroelectric power.

To determine the contributions of each of these releases, the amount of time it takes the water to travel from the release point to the USGS gage at Montague, New Jersey, is required. The various travel times are used to determine the appropriate time-delayed flow contributions from the above sources. The time-adjusted controlled flows are subtracted from the total streamflow measured at the Montague gaging station to determine the uncontrolled runoff (including reservoir spills and groundwater) from the drainage area upstream from Montague.

Travel times were computed from reservoir and powerplant operations data and historical streamflow records. The travel times are generally adequate for River Master operations. Occasionally, however, significant exceptions are observed. For example, during a large increase in directed release from Cannonsville Reservoir, the arrival time of the water at Montague can be delayed as much as 1.5 days because a substantial amount of water must first fill the channel before a steady flow arrives at Montague. 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. Following are the 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 2010 report year.

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

Forecasting Streamflow, Delaware River at Montague, New Jersey

The second step in the process for determining the directed releases is to forecast the streamflow at Montague. The flow must be forecast 3 days in advance to account for the travel time needed from the furthest New York City reservoir, Pepacton.

The electric utilities furnished forecasts of power generation and releases. Because the hydroelectric plants were used chiefly for meeting rapidly varying 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.

An estimate of uncontrolled runoff was computed using a routing and recession procedure based on discharges at 0800 hours at the following USGS gaging stations:

Station name (and number)	Drainage area (square miles)
Beaver Kill at Cooks Falls, New York (01420500)	241
Oquaga Creek at Deposit, New York (01426000)	67.6
Equinunk Creek at Equinunk, Pennsylvania (01427203)	56.3
Callicoon Creek at Callicoon, New York (01427500)	110
Tenmile River at Tusten, New York (01428000)	45.6
Lackawaxen River at Hawley, Pennsylvania (01431500)	290
Shohola Creek near Shohola, Pennsylvania (01432500)	83.6
Neversink River at Port Jervis, New York (01438000)	336

Throughout the year, the National Weather Service (NWS) office in Binghamton, New York, furnished quantitative forecasts of average precipitation and air temperatures for the 3,480-square-mile (mi^2) drainage basin upstream from Montague, New Jersey. During winter, runoff was estimated on the basis of the 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, is computed as the sum of forecasted releases from power reservoirs, estimated uncontrolled runoff including conservation releases from Rio Reservoir, and estimated runoff from predicted rainfall. 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 updated forecasts of precipitation or powerplant releases showed appreciable changes after a release was directed, the release required from the City's reservoirs was recomputed on the basis of the updated forecasts. Commonly, this procedure resulted in a reduced release requirement for New York City reservoirs that day. Only final values for releases from New York City reservoirs are presented in this report.

Hydrologic Conditions

Precipitation

Precipitation in the Delaware River Basin above Montague, New Jersey, totaled 49.38 inches (in.) during the 2010 report year and was 112 percent of the long-term (69-year) average. Monthly precipitation ranged from 60 percent of the long-term average in September 2010 to 249 percent of the long-term average in October 2010. Monthly precipitation during the report year and long-term average precipitation are presented in table 1. Precipitation data for the 2010 report year were computed from records for five geographically distributed stations: the Pepacton, Neversink, and Cannonsville Reservoir stations; the Hawley NWS station; and the USGS Milford station. These stations were operated by the NWS; New York City Department of Environmental Protection (DEP), Bureau of Water Supply; and ODRM.

The seasonal period from December to May typically is when surface-water and groundwater reservoirs refill. During this period in 2009–2010, total precipitation was 21.96 in., which is 108 percent of the 69-year average. During the June to November period, total precipitation was 27.42 in., which is 116 percent of the long-term average.

Reservoir Storage

The following table 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 DEP, Bureau of Water Supply.

[Reservoir contents are in billion gallons. —, not applicable]

Level	Pepacton Reservoir		Cannonsville Reservoir		Neversink Reservoir	
	Elevation	Contents	Elevation	Contents	Elevation	Contents
Full pool or spillway crest	1,280	—	1,150	—	1,440	—
Point of maximum depletion	1,152	[1]140.190	1,040	[1]95.706	1,319	[1]34.941
Sill of diversion tunnel	1,143	[2]3.511	[3]1,035	[2]1.020	1,314	[2]0.525
Sill of river outlet tunnel	1,126.50	[4]4.200	1,020.50	[4]1.564	1,314	—
Dead storage	—	1.800	—	0.328	—	1.680

[1]Quantity stored between full pool or spillway crest and point of maximum depletion.

[2]Quantity stored between point of maximum depletion and sill of diversion tunnel.

[3]Elevation of mouth of inlet channel of diversion works.

[4]Quantity stored between sill of diversion tunnel and sill of river outlet tunnel.

Daily storage in Pepacton, Cannonsville, and Neversink Reservoirs, above the "point of maximum depletion" or minimum full-operating level, is given in tables 2, 3, and 4, respectively, and combined storage during the report year is shown in figure 2. On December 1, 2009, combined useable storage in the three reservoirs was 240.016 billion gallons (Bgal) or 88.6 percent of combined capacity. From December to May, inflow to the New York City reservoirs typically exceeds outflow and consequently, storage increases. Combined storage increased throughout the report year, and the reservoirs were at about 100 percent of useable capacity on May 31, 2010. Combined storage remained high (above 80 percent combined capacity) until September 2010. The lowest combined storage was 150.869 Bgal or 55.7 percent on September 30, 2010.

The three reservoirs spilled a total of 55.535 Bgal during the year. Pepacton spilled from March 22, 2010, to April 10, 2010. Cannonsville spilled from March 23, 2010, to April 10, 2010, and from April 27, 2010, to May 22, 2010. Neversink spilled from March 23, 2010, to April 7, 2010. Combined storage reached a maximum for the report year on March 25, 2010, at 277.424 Bgal. The reservoirs' storage decreased from that point, and the combined storage was 229.397 Bgal or 84.7 percent of combined capacity on November 30, 2010.

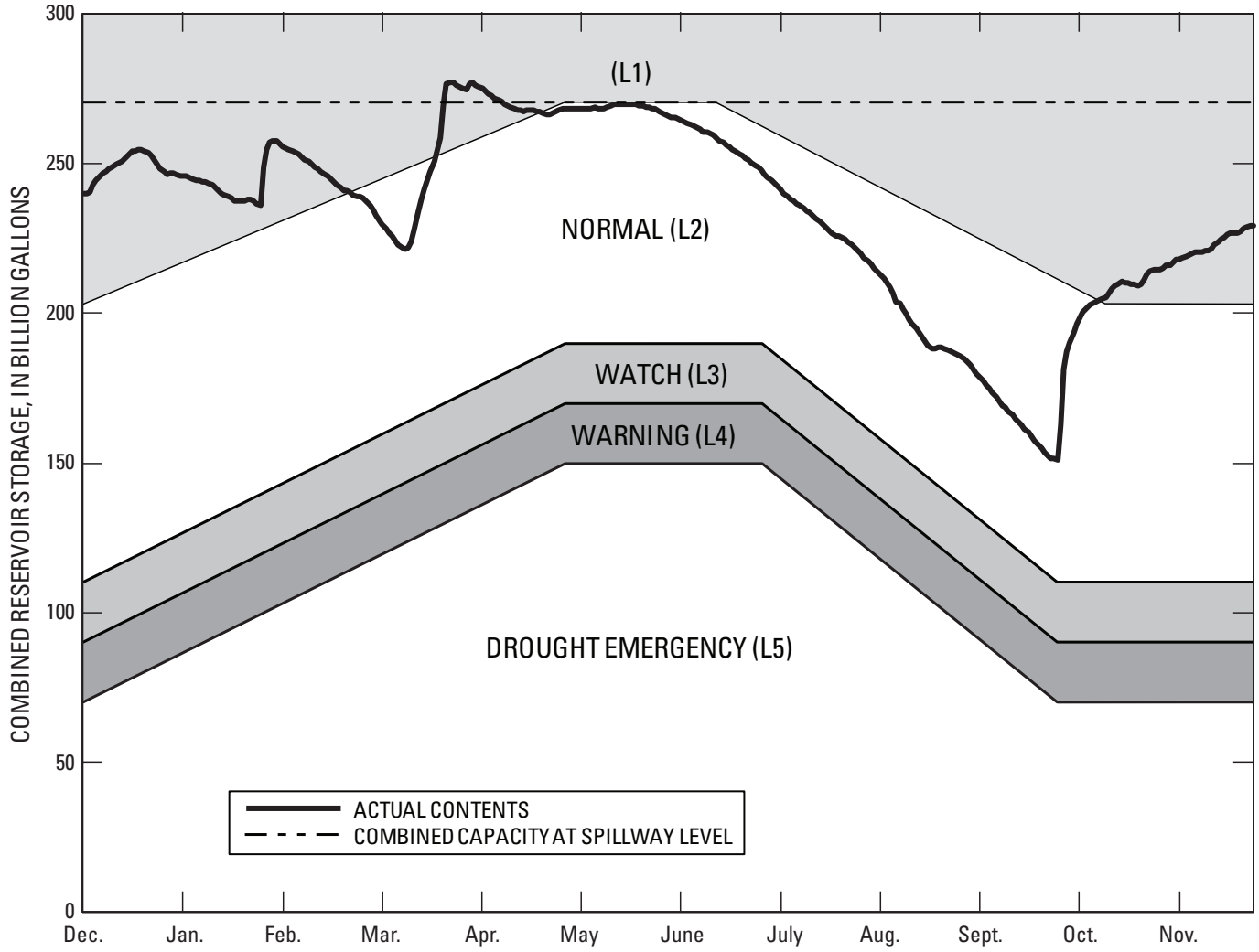

Figure 2. Graph showing operation curves and actual contents for New York City reservoirs in the Delaware River Basin, December 1, 2009, to November 30, 2010.

Operations

Operations during December 1, 2009, through November 30, 2010, were conducted as described by the FFMP (revised, effective December 10, 2008). The allowable diversion to New York City was 800 million gallons per day (Mgal/d), and the Montague flow objective was 1,750 cubic feet per second (ft^3/s). The allowable diversion to New Jersey was 100 Mgal/d, except from September 24, 2010, to October 31, 2010. The Delaware River Basin Commission (DRBC) issued a lower basin drought warning on September 24, 2010, for the portion of the watershed downstream from Montague, New Jersey. The Trenton, New Jersey, flow objective was decreased from 3,000 ft^3/s to 2,500 ft^3/s. In addition, New Jersey's allowable diversion of water from the Delaware River was reduced from 100 Mgal/d to 85 Mgal/d. After heavy rainfall (3 to 10 in.) in the last week of September 2010, reservoir elevations rebounded, and the drought warning automatically terminated on October 31, 2010. Conservation releases from New York City reservoirs were made at the rates shown in table 5, which are consistent with those incorporated in the FFMP.

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 specifies that the diversion rate shall be computed as the aggregate total diversion beginning June 1 of each year divided by the total number of days elapsed since the preceding May 31. Under the FFMP, New York City anticipated its average diversion would be less than 765 Mgal/d and made a quantity of water equivalent to 35 Mgal/d available to supplement reservoir releases as established in the FFMP Tailwater Habitat Protection and Discharge Mitigation Program.

Records of diversions through the East Delaware, West Delaware, and Neversink Tunnels (fig. 1) were furnished by the New York City DEP. 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 City computers, and 5-minute interval 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 ODRM each day. Each week, the computed diversion values were checked against the flow meter totalizer readings by the New York City DEP and corrected when necessary.

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 6. A running account of the average rates of combined diversions from the three reservoirs, computed as stipulated by the Decree, also is shown in table 6. A total of 199.514 Bgal of water was diverted to the New York City water-supply system during the report year with an average of 546.6 Mgal/d, which is below the maximum diversion rate. The maximum daily diversion from a single reservoir was 674 Mgal on October 7, 2010, from Pepacton Reservoir. The maximum daily combined diversion from all three reservoirs was 1,306 Mgal on October 24, 2010. Diversions by New York City did not exceed the limits stipulated by the Decree and the FFMP. 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.

The East Delaware Tunnel is used to divert water from Pepacton Reservoir to 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 showed that the (assumed constant) rate of leakage is about 8.0 Mgal/d. Because the powerplant was not in operation for the equivalent of 71 days during the 2010 report year, the estimated quantity of unmeasured leakage (diverted but not recorded) was about 0.6 Bgal.

The West Delaware Tunnel is used to divert water from Cannonsville Reservoir to Rondout Reservoir. Inspections of the channel below the outlet, when the 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 2010 report year, the powerplant operated part of the day on most days and was not operated the equivalent of 230 days. About 2.4 Bgal of water was diverted but not recorded according to the leakage rate noted above and records of powerplant operation.

Diversions by New Jersey

The 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. Under the FFMP, New Jersey diversions shall not exceed 100 Mgal/d as a monthly average, and the daily mean diversion shall not exceed 120 Mgal/d. When the lower basin is in a drought warning period, diversions shall not exceed 85 Mgal/d as a running average. The lower basin was in drought warning from September 24, 2010, to October 31, 2010.

The USGS gaging station (01460440) on the Delaware and Raritan Canal at Port Mercer, New Jersey (fig. 1), is used as the official control point for measuring these diversions by New Jersey (table 8). On the basis of data collected by the USGS at this site, the maximum monthly average diversion was 89.1 Mgal/d during November 2010. The maximum daily mean diversion was 103 Mgal on December 12, 2009. During the lower basin drought warning period (September 24 to October 31, 2010), the maximum running average was 84.6 Mgal/d. Diversions by New Jersey did not exceed the limits stipulated by the FFMP.

Montague Flow Objective

The components of forecasted flow at Montage during low flow (forecasted releases from power reservoirs, estimated uncontrolled runoff including conservation releases from Rio Reservoir, and forecasted increase in runoff from precipitation) and the sums of flows exclusive of releases from New York City's reservoirs are given in table 9. If the computed sum of the components 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. Table 10 presents 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.

The forecasted discharge at Montague, exclusive of water released from the New York City reservoirs, was greater than the flow objective on all days in the period from December 1, 2009, to June 27, 2010, and no releases were directed. The observed daily mean discharge at Montague was greater than the applicable flow objective (1,750 ft^3/s) on all days during this period.

The forecasted discharge at Montague, exclusive of water released from the New York City reservoirs, was less than the flow objective on 81 days between June 27, 2010, and September 28, 2010, and directed releases were required. On 15 days during the July 18, 2010, to September 30, 2010, period, the observed flow was less than the flow objective. On two of these days, September 17 and 21, 2010, the observed flow was greater than the flow target when accounting for the balancing adjustment (−50 ft^3/s on both days). Of the 15 observed flows, 11 were within 10 percent of the flow objective. On September 30, 2010, the observed flow was 1,380 ft^3/s, 78 percent of the flow objective.

The forecasted discharge at Montague, exclusive of water released from the New York City reservoirs, was greater than the flow objective from September 28, 2010, to November 30, 2010, and no directed releases were required. However, the observed daily mean discharge at Montague was less than the flow objective on 2 days during this period. On September 29 and 30, 2010, the flows were 1,580 and 1,450 ft^3/s, respectively.

The total discharge observed at Montague from June to October 2010 is shown in figure 3. The discharge is segregated into the portion derived from the New York City reservoirs, the portion contributed by the power reservoirs, and the uncontrolled runoff from the drainage area below the reservoirs. As described above, the uncontrolled runoff was computed as the residual of observed flow minus releases and spills from all reservoirs and was subject to errors in observations, transit times, and routings of the various components of flow. The conservation release from Rio Reservoir is included in the uncontrolled runoff component. The effect of these uncertainties is incorporated in the computation of uncontrolled runoff.

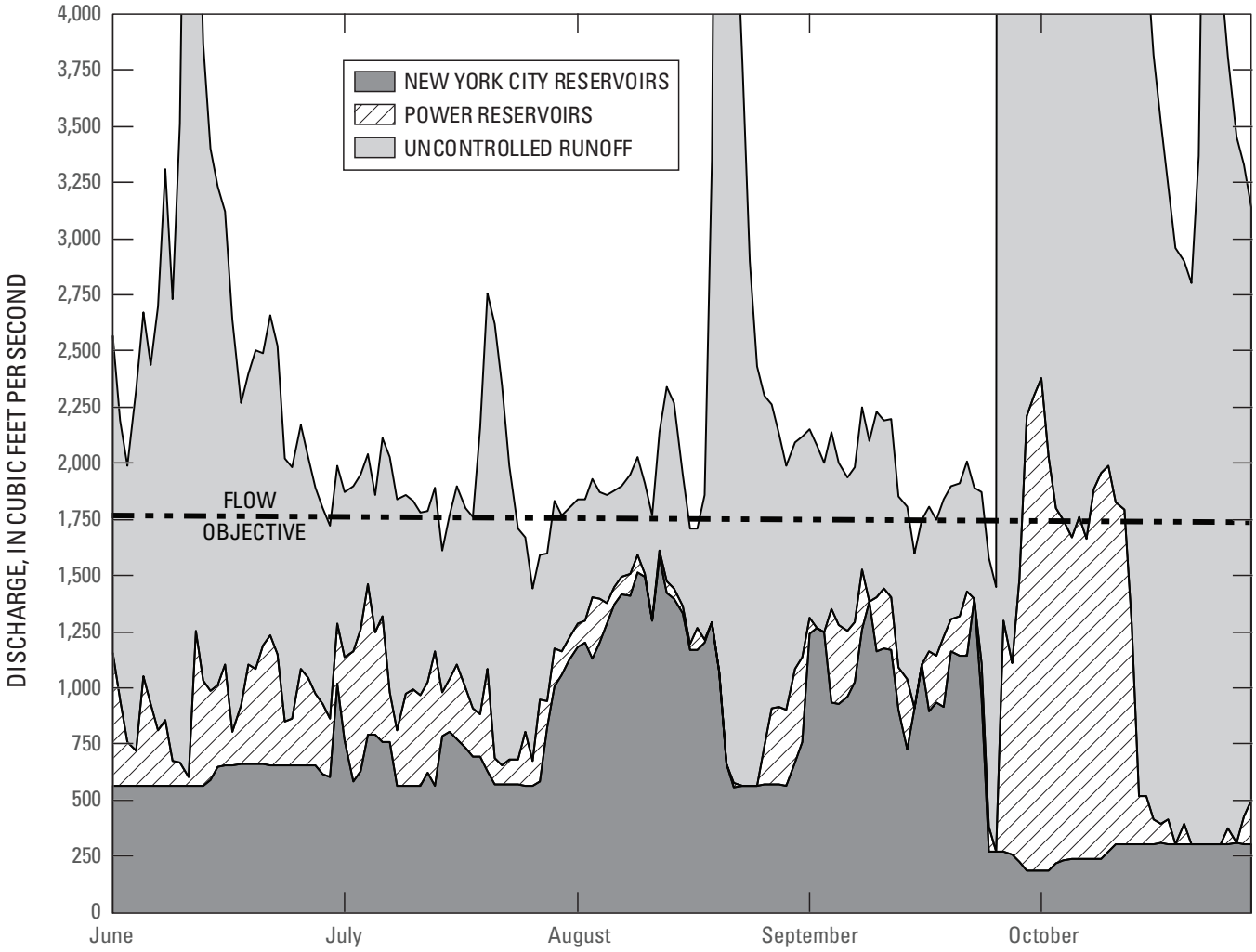

Figure 3. Graph showing components of flow, Delaware River at Montague, New Jersey, June 27 to September 30, 2010.

Excess Release Quantity and Interim Excess Release Quantity

Per section 4.c of the 2008 FFMP, the IERQ is established as 15,648 (ft^3/s)-d. The FFMP specifies that New York City shall release the IERQ provided for above at rates designed to increase the flow at Montague from 1,750 ft^3/s to 1,850 ft^3/s for the period commencing on June 15 and continuing through September 15, and to maintain a flow of 3,000 ft^3/s at the USGS streamgage Delaware River at Trenton, New Jersey (01463500), during basinwide normal conditions for the period commencing on June 15 and continuing through March 15 (seasonal period). Changes were agreed upon in May 2010 (see appendix 3), however, and the flow objective was held at 1,750 ft^3/s throughout the entire year. A quantity of 9,300 (ft^3/s)-d resulted from the 100-ft^3/s summertime increment of the Montague flow objective. The quantity was debited from the IERQ and designated as an IERQ Extraordinary Needs Bank.

A portion of the 9,300 (ft^3/s)-d of the IERQ Extraordinary Needs Bank was used as follows:

1. Releases of 3,233 (ft^3/s)-d provided increased summertime (June 1–August 31) releases from Cannonsville Reservoir
2. The New York State Department of Environmental Conservation used 329 (ft^3/s)-d for water temperature control on July 9–11, 2010 (see appendix 4).

In 2010, 5,950 (ft^3/s)-d of the IERQ water was released to maintain a target flow of 3,000 ft^3/s at Trenton from August 1, 2010, to September 23, 2010. The unused portion of the IERQ Extraordinary Needs Bank was restored to the annual IERQ balance to be used to maintain the flow target at Trenton on September 24, 2010 (see appendix 5). Because of heavy rainfall the last week of September 2010, IERQ water was not released to maintain the flow target at Trenton after September 24, 2010.

Maintenance needs or other considerations may occasionally require modifications to normal reservoir operations. The Rondout West Branch Tunnel was shut down from December 6, 2009, through December 13, 2009, for replacement of a 24-inch gate valve. A second shutdown lasted from January 11, 2010, through January 26, 2010, for bronze door testing and replacement. Effective September 1, 2009, until May 31, 2010, the Decree Parties approved a temporary supplemental releases program to address these shutdowns (the Rondout West Branch Tunnel Shutdown). This agreement is presented in appendix 6. The agreement was reissued from June 1, 2010, until May 31, 2011, and the revised agreement is presented in appendix 7. During these two shutdown periods, supplemental releases were made from Cannonsville, Pepacton, and Neversink Reservoirs. From December 1, 2009, to June 3, 2010, a total volume of 18,112 Mgal was released.

Tailwaters Habitat Protection and Discharge Mitigation Program

The FFMP established a Tailwaters Habitat Protection and Discharge Mitigation Program (THPDMP), which consists of conservation releases designed for protection of the ecology in the tailwaters below the New York City Delaware Basin reservoirs and discharge mitigation releases designed to help mitigate the effects of spilling immediately below the City's Delaware Basin reservoirs. Controlled releases were made from the New York City Delaware Basin reservoirs in accordance with the FFMP. From December 1, 2009, to November 30, 2010, 178.579 Bgal was released from the New York City Delaware Basin reservoirs in accordance with the THPDMP.

Comparison of River Master Operations Data with Other 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.

Analysis of Forecasts

Forecasts of streamflow at Montague, based on anticipated contributions from the components described previously but excluding releases from New York City reservoirs, differed from observed flow on most days. 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 Delaware Basin reservoirs, was less than the flow objective on most days from late June through September 2010. The following tabulation computes forecasted and actual hydroelectric power releases for the period from June 27 to September 30, 2010.

Releases and runoff	Sum of forecasted flow ([ft³/s]-d)	Sum of actual flow ([ft³/s]-d)
Lake Wallenpaupack	17,626	18,014
Rio Reservoir	781	1,855
Runoff from uncontrolled area	87,115	96,537

For the June 27 to September 30, 2010, period shown in the tabulation above, actual releases from Lake Wallenpaupack and Rio Reservoir averaged 2 and 137 percent more than the forecasted releases, respectively. Observed runoff from the uncontrolled area was about 11 percent more than forecasted runoff.

On any given day, forecasted releases and actual releases can differ considerably. The ranges of actual daily releases from June 27 to September 30, 2010, are as follows: daily releases at Lake Wallenpaupack differed from forecasted releases by 206 ft³/s less to 270 ft³/s greater, and daily releases at Rio Reservoir differed from forecasted releases by 142 ft³/s less to 195 ft³/s greater. On the basis of gaged streamflow at Montague, total directed releases from New York City Delaware Basin reservoirs during the report year were about 6 percent more than required for exact forecasting.

Comparison of hydrographs of forecasted daily runoff and observed daily runoff from the uncontrolled area (fig. 4) indicated that the forecasts generally were suitable for use in designing releases from New York City Delaware Basin reservoirs. Numerical adjustments to the designs were made when needed to 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.

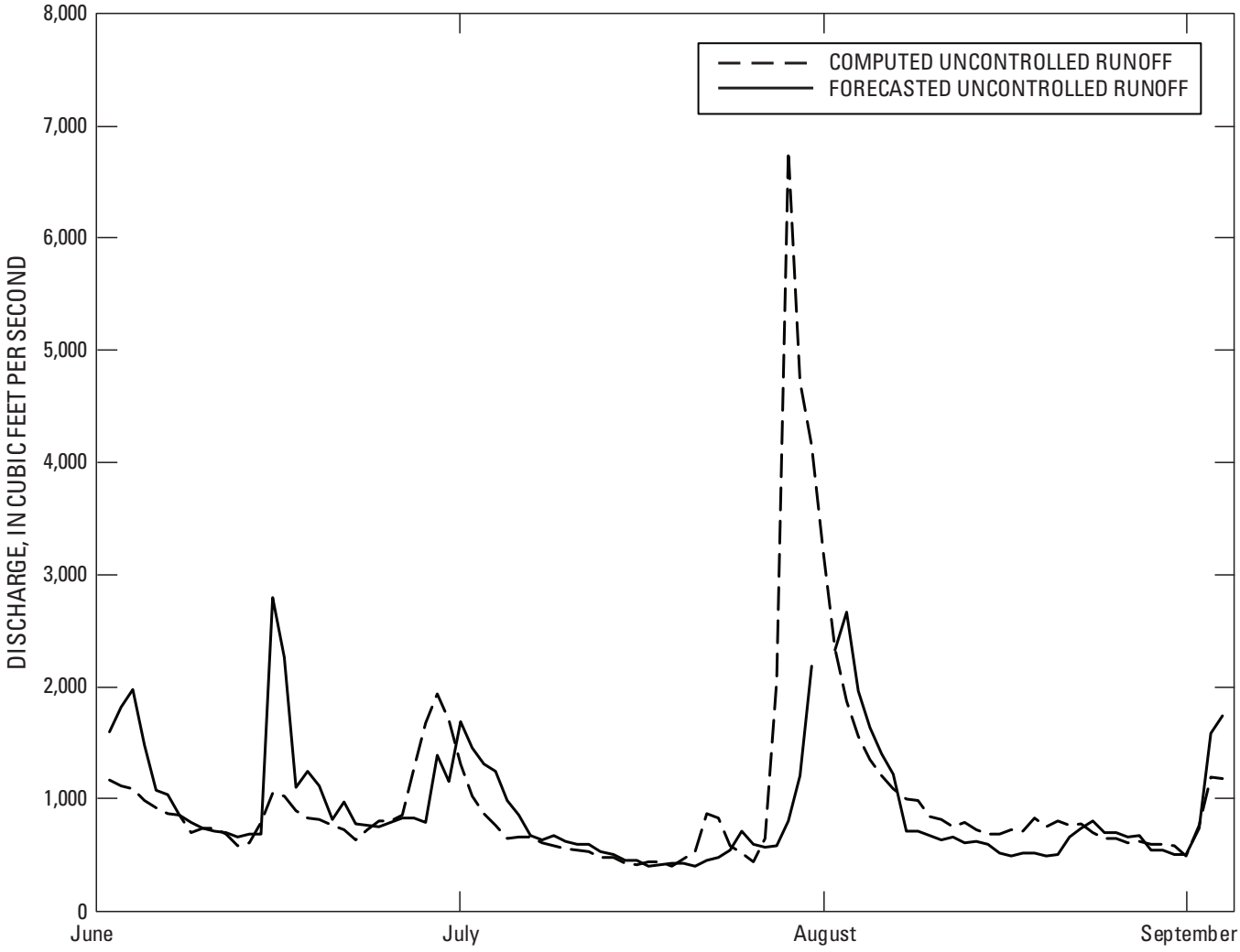

Figure 4. Hydrograph of uncontrolled runoff component, Delaware River at Montague, New Jersey, June 27 to September 30, 2009.

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 DEP. These data were collected from calibrated instruments connected to venturi meters installed in the outlet conduits of the reservoirs.

The USGS streamgage on East Branch Delaware River at Downsville, New York (01417000), is 0.5 mile (mi) 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 gaging station's records are rated good, which means that about 95 percent of the daily mean discharges are within 10–15 percent of the true discharge.

Figure 5*A* shows releases from Pepacton Reservoir (table 10), reported by New York City, versus the final records for the USGS gaging station on East Branch Delaware River at Downsville, New York (table 11), from December 1, 2009, to November 30, 2010. The mean difference is 5 percent, and 95 percent of the daily differences between the gage readings and New York City records are less than 14 percent. Larger differences rarely occur and may be due to rainfall. 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 streamgage on West Branch Delaware River at Stilesville, New York (0142500), is 1.4 mi 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 mean discharges are within 15 percent of true discharge, whereas a rating of poor means that the daily mean 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.

Figure 5*B* shows releases from Cannonsville Reservoir (table 10) reported by New York City versus the final records for the USGS gaging station on West Branch Delaware River at Stilesville, New York (table 12), from December 1, 2009, to November 30, 2010. The mean difference is 9 percent, and 95 percent of the daily differences between the gage readings and New York City records are less than 24 percent. The larger differences are primarily at lower flows, which corresponds with the poor rating of the gaging-station records at lower flows.

The USGS streamgage on Neversink River at Neversink, New York (0143600), is 1,650 feet 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 gaging station records are rated good, which means that about 95 percent of the daily mean discharges are within 10 percent of the true discharge.

Figure 5*C* shows releases from Neversink Reservoir (table 10), reported by New York City, versus the final records for the USGS gaging station on Neversink River at Neversink, New York (table 13), from December 1, 2009, to November 30, 2010. The mean difference is 5 percent, and 95 percent of the daily differences between the gage readings and New York City records are less than 14 percent.

Delaware River at Montague, New Jersey

The River Master's operations record for the Delaware River at Montague, New Jersey (table 9), showed about 0.6 percent more discharge for the report year than the published USGS record for the gaging station (table 14). Daily values for the two records agreed closely, except during ice-affected periods and the summer vegetation growth season.

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

From December 1, 2009, to November 30, 2010, operations of the Delaware River Master were conducted as stipulated by the Decree and the FFMP.

Diversions from the Delaware River Basin to the New York City water-supply system did not exceed those authorized by the Decree and the FFMP. 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.

The IERQ was used in accordance with the FFMP and agreements completed throughout the report year.

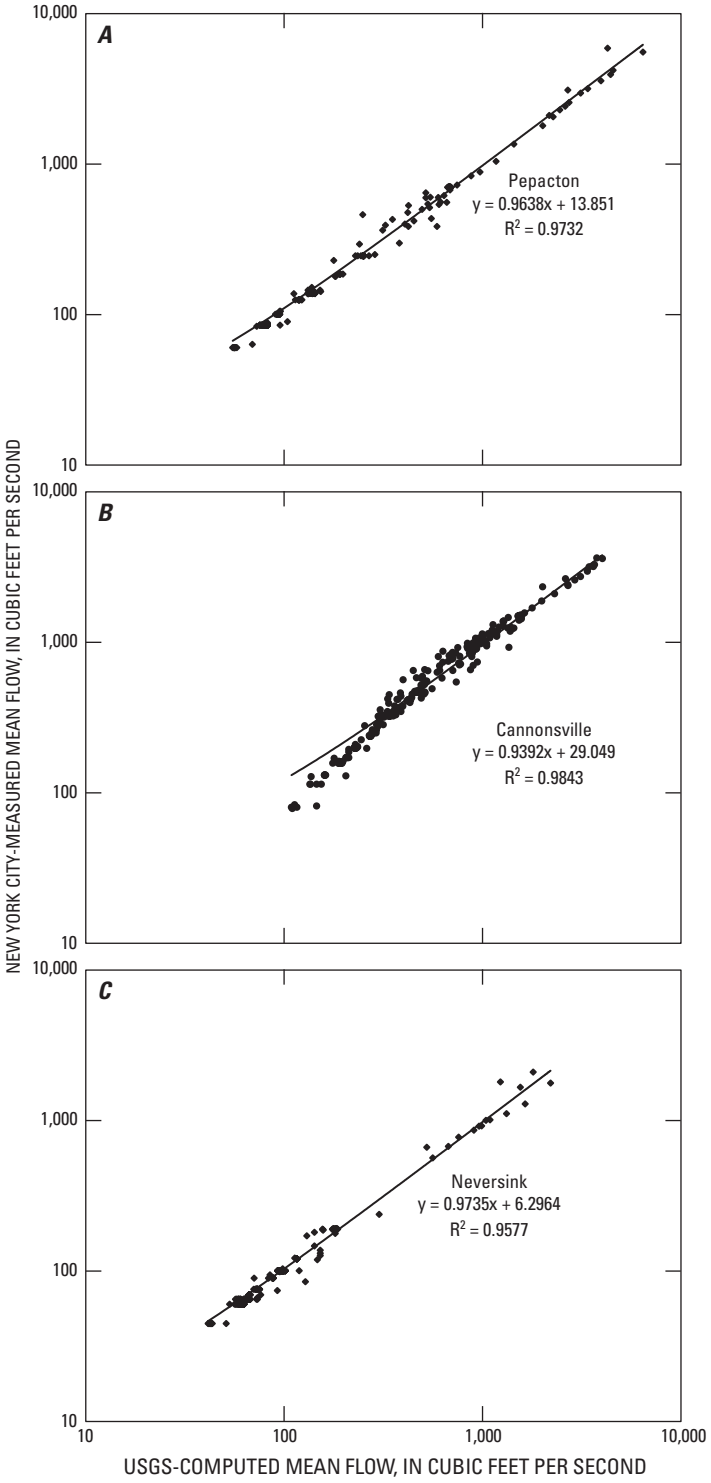

Figure 5. Graphs showing measured New York City reservoir releases versus computed mean flow records for downstream U.S. Geological Survey (USGS) gaging stations: (*A*) Pepacton Reservoir and gaging station on East Branch Delaware River at Downsville, New York; (*B*) Cannonsville Reservoir and gaging station on West Branch Delaware River at Stilesville, New York; and (*C*) Neversink Reservoir and gaging station on Neversink River at Neversink, New York.

Table 1. Precipitation in the Delaware River Basin upstream from Montague, New Jersey.

[Source: National Weather Service and New York City Department of Environmental Protection. All values, except percentages, in inches. —, not applicable]

Month	December 1940 to November 2009 monthly average	December 2009 to November 2010			
		Amount	Percent of average	Excess (+) or deficit (−) compared with long-term average	
				Month	Cumulative
December	3.45	4.35	126	0.90	0.90
January	3.05	2.90	95	−0.15	0.75
February	2.63	3.47	132	0.84	1.59
March	3.37	5.36	159	1.99	3.58
April	3.76	2.86	76	−0.90	2.68
May	4.16	3.02	73	−1.14	1.54
June	4.13	3.90	94	−0.23	1.31
July	4.13	4.49	109	0.36	1.67
August	3.93	5.40	137	1.47	3.14
September	4.02	2.40	60	−1.62	1.52
October	3.64	9.07	249	5.43	6.95
November	3.77	2.83	75	−0.94	6.01
Total for 12 months	44.05	50.05	114	—	—

Table 2. Storage in Pepacton Reservoir, New York, for year ending November 30, 2010.

[River Master daily operations record; gage reading at 0800 hours; data provided by New York City. Storage in millions of gallons above elevation 1,152.00 feet. Add 7,711 million gallons for total contents above sill of outlet tunnel, elevation 1,126.50 feet. Storage at spillway level is 140,190 million gallons. —, not applicable]

Day	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.
1	124,308	129,448	136,654	123,859	142,696	138,737	138,131	127,670	115,608	103,893	97,511	114,346
2	124,378	129,165	136,708	123,118	142,378	138,811	137,966	127,198	115,177	103,468	104,827	114,761
3	124,846	128,796	136,654	122,429	142,192	138,848	137,748	126,708	114,812	102,979	106,868	115,061
4	126,044	128,479	136,581	121,694	142,080	138,866	137,528	126,237	114,396	102,492	108,024	115,028
5	126,778	128,093	136,181	121,129	141,839	138,903	137,145	125,714	114,014	102,039	109,186	115,343
6	127,390	127,846	135,656	120,514	141,357	138,866	136,799	125,227	113,716	101,586	109,835	115,492
7	127,882	127,688	135,058	119,936	140,950	138,774	136,581	124,725	113,272	101,086	110,176	115,492
8	128,304	127,582	134,444	119,359	140,653	138,737	136,145	124,239	112,826	100,590	110,404	115,426
9	128,778	127,355	133,869	118,799	140,523	138,793	135,765	123,842	112,365	100,078	110,631	115,559
10	129,148	127,146	133,240	118,377	140,375	138,682	135,475	123,549	111,906	99,629	110,762	115,709
11	129,483	126,883	132,594	118,141	140,079	138,553	135,167	123,428	110,398	99,151	110,647	115,842
12	129,748	126,691	132,004	118,512	139,859	138,461	134,750	123,032	110,892	98,644	110,551	115,893
13	129,925	126,394	131,309	119,376	139,656	138,645	134,660	122,601	110,533	98,198	110,420	115,909
14	130,528	126,342	130,635	121,626	139,528	138,976	134,462	122,173	110,208	98,168	110,306	115,893
15	131,025	126,394	129,925	124,777	139,400	139,381	134,084	121,814	109,867	97,786	110,241	115,859
16	131,630	126,412	129,236	127,006	139,271	139,363	133,689	121,351	109,543	97,313	110,941	115,826
17	131,791	126,464	128,602	128,602	139,234	139,345	133,365	120,992	109,234	96,856	111,595	115,893
18	132,165	126,603	128,005	129,996	139,160	139,308	133,024	120,514	108,846	96,400	112,021	116,411
19	132,434	126,708	127,565	131,434	139,013	139,308	132,629	120,157	108,540	95,978	112,316	116,679
20	132,487	126,691	127,181	132,970	138,848	139,400	132,237	119,699	108,088	95,523	112,662	116,863
21	132,541	126,761	126,813	134,750	138,645	139,638	131,809	119,240	107,605	95,071	112,679	117,014
22	132,272	126,778	126,412	136,690	138,443	139,638	131,416	118,985	107,188	94,590	112,695	117,064
23	131,773	126,726	126,010	141,709	138,205	139,619	131,043	118,596	107,172	94,126	112,646	117,132
24	131,309	126,447	125,888	143,667	137,966	139,583	130,652	118,478	106,996	93,692	112,547	117,064
25	130,866	126,377	125,905	142,976	137,875	139,509	130,369	118,242	106,740	93,229	112,431	116,981
26	130,440	131,809	125,870	142,528	138,003	139,363	129,908	117,972	106,420	92,799	112,778	117,014
27	130,263	134,084	125,279	142,192	138,277	139,326	129,448	117,619	106,052	92,323	113,206	117,166
28	130,369	135,239	124,585	141,839	138,351	139,271	129,007	117,232	105,637	91,924	113,981	117,199
29	130,245	135,910	—	141,857	138,480	138,995	128,585	116,796	105,241	91,688	114,230	117,216
30	129,908	136,272	—	141,783	138,609	138,737	128,163	116,428	104,795	91,364	114,313	117,149
31	129,660	136,472	—	142,826	—	138,443	—	116,009	104,351	—	114,363	—
Change[1]	+5,352	+7,024	−12,069	+18,967	−4,087	−294	−9,968	−11,661	−11,257	−12,529	+16852	+2,803
Equiv. million gallons per day[2]	+172.6	+226.6	−431	+611.8	−136.2	−9.5	−332.3	−376.2	−363.1	−417.6	+543.6	+93.4
Equiv. cubic feet per second[3]	+267	+350.5	−666.7	+1,023.8	−210.7	−14.7	−514	−582	−561.7	−646	+840.9	+144.5

[1]Change = storage on the last day of the month − storage on the first day of the month. Net change for the year is −7,159.0 million gallons. Minimum/maximum storage for December–May is 118,141/143,667; minimum/maximum storage for June–November is 91,364/138,131.

[2]Net equivalent (equiv.) for year is −19.6 million gallons per day (Mgal/d).

[3]Net equiv. for year is −30.3 cubic feet per second (ft^3/s).

Table 3. Storage in Cannonsville Reservoir, New York, for year ending November 30, 2010.

[River Master daily operations record; gage reading at 0800 hours; data provided by New York City. Storage in millions of gallons above elevation 1,040.00 feet. Add 2,584 million gallons for total contents above sill of outlet tunnel, elevation 1,020.50 feet. Storage at spillway level is 95,706 million gallons. —, not applicable]

Day	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.
1	85,571	85,427	86,828	82,146	99,022	96,301	93,348	85,644	73,569	55,347	39,789	72,987
2	85,369	85,513	86,467	81,394	98,700	96,205	93,257	85,224	72,907	54,883	49,049	73,410
3	85,268	85,456	86,539	80,585	98,233	96,092	93,196	84,632	72,364	54,288	52,490	73,795
4	85,745	85,282	86,496	79,825	97,798	96,060	93,105	84,183	71,596	53,447	54,112	73,927
5	86,135	85,138	86,554	79,051	97,363	95,980	92,968	83,807	70,775	52,572	55,872	74,257
6	86,496	85,210	86,727	78,305	96,961	95,850	92,786	83,388	70,086	51,791	57,960	74,685
7	86,799	85,282	86,814	77,517	96,591	95,754	92,649	82,912	69,278	51,138	59,462	74,947
8	87,002	85,311	86,843	76,771	96,237	95,819	92,497	82,406	68,378	50,426	60,817	75,155
9	87,262	85,123	86,886	76,081	95,963	96,012	92,223	81,943	67,384	49,725	61,855	75,362
10	87,378	84,704	86,915	75,486	95,754	96,044	92,116	81,611	66,439	48,959	62,683	75,542
11	87,666	84,024	86,958	74,989	95,463	95,996	91,933	81,308	65,434	48,070	63,358	75,859
12	87,854	83,302	86,958	75,113	95,204	96,028	91,675	81,018	64,415	47,169	63,969	76,081
13	88,057	82,651	86,828	76,067	95,052	96,108	91,492	80,682	63,434	46,368	64,326	76,233
14	88,541	81,972	86,785	77,255	94,915	96,173	91,340	80,336	62,454	45,523	64,848	76,357
15	88,861	81,235	86,727	79,396	94,793	96,301	91,127	79,991	61,384	44,734	65,255	76,440
16	89,119	80,861	86,482	81,134	94,657	96,301	90,823	79,590	60,414	44,100	66,134	76,509
17	89,651	80,170	86,193	82,695	94,672	96,269	90,549	79,134	59,462	43,477	67,190	76,675
18	89,925	79,562	85,933	84,140	94,946	96,189	90,290	78,650	58,522	42,941	67,901	77,269
19	90,077	79,617	85,644	85,456	95,234	96,124	89,956	78,249	57,692	42,342	68,351	77,918
20	90,062	79,755	85,427	86,828	95,371	96,076	89,636	77,890	56,947	41,837	68,749	78,553
21	89,895	79,908	85,326	88,206	95,371	96,012	89,286	77,476	56,165	41,281	69,027	79,092
22	89,469	79,963	85,224	89,712	95,341	95,835	88,906	77,144	55,396	40,703	69,225	79,603
23	88,769	79,769	84,979	92,542	95,265	95,645	88,541	76,785	55,188	39,999	69,411	80,060
24	87,941	79,231	84,776	97,782	95,189	95,463	88,161	76,633	55,860	39,306	69,543	80,474
25	87,103	78,788	84,617	99,199	95,128	95,250	87,826	76,481	56,055	38,559	69,596	80,709
26	86,366	83,778	84,299	99,359	95,189	95,006	87,450	76,219	56,214	37,787	69,966	81,076
27	85,875	86,915	83,648	99,118	95,539	94,763	87,089	75,915	56,239	37,381	70,642	81,683
28	85,774	88,013	82,912	98,571	95,915	94,504	86,698	75,542	56,190	37,272	71,649	82,088
29	85,499	88,252	—	98,152	96,189	94,231	86,381	75,196	56,104	37,153	72,165	82,435
30	85,282	88,057	—	97,878	96,285	93,942	85,990	74,796	56,092	37,093	72,496	82,753
31	85,326	87,551	—	98,603	—	93,622	—	74,216	55,750	—	72,788	—
Change[1]	−245	2,124	−3,916	16,457	−2,737	−2,679	−7,358	−11,428	−17,819	−18,254	32,999	9,766
Equiv. million gallons per day[2]	−7.9	68.5	−139.9	530.9	−91.2	−86.4	−245.3	−368.6	−574.8	−608.5	1,064.50	326
Equiv. cubic feet per second[3]	−12.2	106	−216.3	821.2	−141.1	−133.7	−379.4	−570.3	−889.2	−941.3	1,646.70	503.6

[1]Change = storage on the last day of the month − storage on the first day of the month. Net change for the year is −2,818.0 million gallons. Minimum/maximum storage for December–May is 74,989/99,359; minimum/maximum storage for June–November is 74,989/99,359.

[2]Net equivalent (equiv.) for year is −7.7 million gallons per day (Mgal/d).

[3]Net equiv. for year is −11.9 cubic feet per second (ft^3/s).

Table 4. Storage in Neversink Reservoir, New York, for year ending November 30, 2010.

[River Master daily operations record; gage reading at 0800 hours; data provided by New York City. Storage in millions of gallons above elevation 1,319.00 feet. Add 525 million gallons for total contents above sill of outlet tunnel, elevation 1,314.00 feet. Storage at spillway level is 34,941 million gallons; —, not applicable]

Day	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.
1	30,137	31,220	32,405	28,434	35,309	33,591	34,443	33,273	29,513	25,420	25,345	27,056
2	30,168	31,261	31,929	28,390	35,249	33,630	34,453	33,062	29,468	25,366	27,632	27,124
3	30,433	31,275	31,653	28,324	35,254	33,674	34,409	32,895	29,405	25,313	28,036	27,202
4	31,336	31,261	31,174	28,263	35,244	33,722	34,374	32,857	29,356	25,262	28,241	27,279
5	31,648	31,252	30,859	28,254	35,204	33,741	34,355	32,815	29,306	25,205	28,460	27,507
6	31,868	31,220	30,630	28,258	35,180	33,751	34,350	32,767	29,270	25,142	28,707	27,658
7	32,023	31,183	30,359	28,250	35,090	33,765	34,365	32,610	29,213	25,089	28,906	27,775
8	32,150	31,165	30,086	28,250	34,907	33,794	34,345	32,481	29,155	25,039	29,057	27,875
9	32,302	31,183	29,819	28,267	34,793	33,862	34,330	32,344	29,088	24,981	29,168	27,962
10	32,434	31,188	29,647	28,311	34,684	33,876	34,384	32,213	28,637	24,916	29,270	28,058
11	32,557	31,193	29,518	28,342	34,458	33,886	34,419	32,127	28,189	24,863	29,356	28,167
12	32,652	31,202	29,342	28,411	34,209	33,939	34,224	32,090	27,822	24,805	29,414	28,276
13	32,723	31,215	29,186	28,478	34,116	33,983	34,267	31,948	27,503	24,764	29,468	28,359
14	32,938	31,215	29,222	29,151	34,028	34,037	34,365	31,841	27,150	24,711	29,518	28,447
15	33,101	31,215	29,261	29,874	33,920	34,077	34,214	31,719	26,799	24,658	29,584	28,522
16	33,245	31,215	29,101	30,128	33,819	34,106	34,032	31,592	26,545	24,596	29,563	28,601
17	33,014	31,202	29,021	30,227	33,688	34,126	33,838	31,447	26,380	24,568	29,495	28,694
18	32,662	31,239	28,920	30,465	33,804	34,150	33,843	31,397	26,190	24,246	29,329	29,035
19	32,274	31,243	28,835	30,712	33,896	34,224	33,843	31,341	26,013	24,209	29,231	29,195
20	31,892	31,257	28,663	31,215	33,727	34,238	33,838	31,206	25,821	24,173	29,119	29,333
21	31,461	31,252	28,681	31,818	33,649	34,272	33,819	31,017	25,633	23,842	28,747	29,441
22	31,215	31,243	28,694	32,449	33,553	34,281	33,799	30,873	25,578	23,653	28,333	29,580
23	30,947	31,188	28,517	34,927	33,499	34,311	33,804	30,693	25,708	23,465	27,905	29,688
24	30,684	31,118	28,486	35,414	33,456	34,325	33,813	30,561	25,821	23,286	27,477	29,288
25	30,542	31,099	28,482	35,249	33,523	34,325	33,784	30,529	25,741	22,913	27,052	29,163
26	30,410	33,465	28,552	35,219	33,644	34,330	33,761	30,487	25,612	22,882	27,129	29,279
27	30,465	33,939	28,530	35,175	33,649	34,316	33,736	30,314	25,616	22,839	27,300	29,351
28	30,730	33,713	28,486	35,120	33,644	34,409	33,708	30,164	25,595	22,564	27,745	29,450
29	30,910	33,369	—	35,324	33,630	34,443	33,684	29,973	25,549	22,513	27,813	29,554
30	31,003	33,158	—	35,344	33,606	34,443	33,634	29,769	25,512	22,412	27,606	29,495
31	31,113	32,790	—	35,523	—	34,453	—	29,571	25,466	—	27,339	—
Change[1]	976	1,570	−3,919	7,089	−1,703	862	−809	−3,702	−4,047	−3,008	1,994	2,439
Equiv. million gallons per day[2]	31.5	50.6	−140	228.7	−56.8	27.8	−27	−119.4	−130.5	−100.3	64.3	81
Equiv. cubic feet per second[3]	48.7	78.3	−216.5	353.8	−87.8	43	−41.7	−184.7	−202	−155.1	99.5	125.8

[1]Change = storage on the last day of the month − storage on the first day of the month. Net change for the year is −642.0 million gallons. Minimum/maximum storage for December–May is 28,250/35,523; minimum/maximum storage for June–November is 22,412/34,453.

[2]Net equivalent (equiv.) for year is −1.7 million gallons per day (Mgal/d).

[3]Net equiv. for year is −2.7 cubic feet per second (ft^3/s).

Table 5. Conservation release rates for New York City reservoirs in the Delaware River Basin.

[Source: Flexible Flow Management Program, table 3 with 35 million gallons available; table in effect December 1, 2009, to November 30, 2010. All values in cubic feet per second. NA, not available because the storage zone does not apply during this period. Releases were made in accordance with zone L1-c rates]

Storage zone	Winter		Spring		Summer			Fall		
	Dec. 1–Mar. 31	Apr. 1–30	May 1–20	May 21–31	June 1–15	June 16–30	July 1–Aug. 31	Sept. 1–15	Sept. 16–30	Oct. 1–Nov. 30
Cannonsville										
L1-a	1,500	1,500	NA	NA	NA	1,500	1,500	1,500	1,500	1,500
L1-b	250	NA	NA	NA	NA	NA	350	300	275	250
L1-c	110	110	200	250	275	275	275	275	140	110
L2	80	80	190	240	260	260	260	260	115	80
L3	70	70	100	100	175	175	175	95	95	70
L4	55	55	75	75	130	130	130	55	55	60
L5	50	50	50	50	120	120	120	50	50	50
Pepacton										
L1-a	700	700	NA	NA	NA	700	700	700	700	700
L1-b	185	NA	NA	NA	NA	NA	250	200	200	185
L1-c	85	85	110	130	150	150	150	150	100	85
L2	65	65	100	125	140	140	140	140	85	60
L3	55	55	80	80	100	100	100	55	55	55
L4	45	45	50	50	85	85	85	40	40	40
L5	40	40	40	40	80	80	80	30	30	30
Neversink										
L1-a	190	190	NA	NA	NA	190	190	190	190	190
L1-b	100	NA	NA	NA	NA	NA	125	125	85	95
L1-c	65	65	85	100	110	110	110	110	75	60
L2	45	45	75	90	100	100	100	100	70	45
L3	40	40	50	50	75	75	75	40	40	40
L4	35	35	40	40	60	60	60	30	30	30
L5	30	30	30	30	55	55	55	25	25	25

Table 6. Diversions to New York City water-supply system.

[River Master daily operations record. Million gallons per day for 24-hour period beginning 0800 local time. —, not applicable]

Date	East Delaware Tunnel	West Delaware Tunnel	Neversink Tunnel	Average June 1, 2009, to date
12/1/2009	0	298	0	483
12/2/2009	0	284	0	482
12/3/2009	0	32	0	480
12/4/2009	89	0	0	478
12/5/2009	0	0	0	475
12/6/2009	0	0	0	473
12/7/2009	27	0	0	470
12/8/2009	0	0	0	468
12/9/2009	0	0	0	466
12/10/2009	0	0	0	463
12/11/2009	0	0	0	461
12/12/2009	0	0	0	458
12/13/2009	0	0	0	456
12/14/2009	0	0	0	454
12/15/2009	0	0	0	451
12/16/2009	0	0	281	451
12/17/2009	0	0	424	450
12/18/2009	0	0	423	450
12/19/2009	0	0	430	450
12/20/2009	0	0	432	450
12/21/2009	237	0	299	451
12/22/2009	288	181	309	452
12/23/2009	290	219	314	454
12/24/2009	291	199	201	455
12/25/2009	291	199	201	456
12/26/2009	291	199	195	457
12/27/2009	291	199	196	458
12/28/2009	290	199	9	459
12/29/2009	290	199	0	459
12/30/2009	290	199	0	459
12/31/2009	291	199	0	459
Total	**3,256**	**2,606**	**3,714**	**—**

Date	East Delaware Tunnel	West Delaware Tunnel	Neversink Tunnel	Average June 1, 2009, to date
1/1/2010	291	199	0	459
1/2/2010	292	199	0	459
1/3/2010	292	199	0	459
1/4/2010	291	199	0	460
1/5/2010	62	0	0	458
1/6/2010	0	0	0	456
1/7/2010	0	0	0	454
1/8/2010	0	0	0	452
1/9/2010	0	0	0	450
1/10/2010	0	0	0	448
1/11/2010	0	0	0	446
1/12/2010	0	0	0	444
1/13/2010	0	0	0	442
1/14/2010	0	0	0	440
1/15/2010	0	0	0	438
1/16/2010	0	0	0	436
1/17/2010	0	0	0	434
1/18/2010	0	0	0	432
1/19/2010	0	0	0	430
1/20/2010	0	0	0	428
1/21/2010	0	0	0	427
1/22/2010	0	0	0	425
1/23/2010	0	0	0	423
1/24/2010	0	0	0	421
1/25/2010	0	0	0	420
1/26/2010	0	0	0	418
1/27/2010	0	0	443	418
1/28/2010	0	261	481	419
1/29/2010	0	215	272	419
1/30/2010	0	299	418	421
1/31/2010	0	299	420	422
Total	**1,228**	**1,870**	**2,034**	**—**

Table 6. Diversions to New York City water-supply system.—Continued

[River Master daily operations record. Million gallons per day for 24-hour period beginning 0800 local time. —, not applicable]

Date	East Delaware Tunnel	West Delaware Tunnel	Neversink Tunnel	Average June 1, 2009, to date
2/1/2010	0	297	510	423
2/2/2010	12	191	311	424
2/3/2010	13	298	514	425
2/4/2010	360	115	377	427
2/5/2010	443	0	313	429
2/6/2010	443	0	312	430
2/7/2010	443	0	315	431
2/8/2010	443	0	314	432
2/9/2010	442	0	249	433
2/10/2010	434	0	209	434
2/11/2010	448	1	212	435
2/12/2010	442	123	212	436
2/13/2010	442	0	0	436
2/14/2010	449	0	0	437
2/15/2010	442	199	212	438
2/16/2010	442	199	108	439
2/17/2010	442	199	108	440
2/18/2010	442	197	112	442
2/19/2010	444	124	210	443
2/20/2010	442	0	0	443
2/21/2010	442	9	0	443
2/22/2010	442	124	210	444
2/23/2010	261	115	108	444
2/24/2010	0	0	0	443
2/25/2010	310	0	0	442
2/26/2010	432	0	0	442
2/27/2010	440	0	0	442
2/28/2010	435	0	0	442
Total	**10,230**	**2,191**	**4,916**	—

Date	East Delaware Tunnel	West Delaware Tunnel	Neversink Tunnel	Average June 1, 2009, to date
3/1/2010	430	0	0	442
3/2/2010	425	0	0	442
3/3/2010	424	0	0	442
3/4/2010	263	0	0	441
3/5/2010	295	0	0	441
3/6/2010	294	0	0	440
3/7/2010	293	0	0	440
3/8/2010	297	0	0	439
3/9/2010	294	0	0	439
3/10/2010	270	0	0	438
3/11/2010	16	0	0	437
3/12/2010	0	0	0	435
3/13/2010	0	0	0	434
3/14/2010	0	0	0	432
3/15/2010	376	175	340	434
3/16/2010	447	199	401	436
3/17/2010	298	0	218	436
3/18/2010	296	0	218	436
3/19/2010	198	0	2	436
3/20/2010	198	0	0	435
3/21/2010	196	0	0	434
3/22/2010	2	0	0	432
3/23/2010	0	0	0	431
3/24/2010	0	0	0	430
3/25/2010	0	0	0	428
3/26/2010	0	0	0	427
3/27/2010	0	0	0	425
3/28/2010	0	0	0	424
3/29/2010	0	0	0	422
3/30/2010	0	0	0	421
3/31/2010	0	0	0	420
Total	**5,312**	**374**	**1,179**	—

Table 6. Diversions to New York City water-supply system.—Continued

[River Master daily operations record. Million gallons per day for 24-hour period beginning 0800 local time. —, not applicable]

Date	East Delaware Tunnel	West Delaware Tunnel	Neversink Tunnel	Average June 1, 2009, to date
4/1/2010	0	0	0	418
4/2/2010	0	0	0	417
4/3/2010	0	0	0	416
4/4/2010	0	0	0	414
4/5/2010	415	0	0	414
4/6/2010	449	0	186	415
4/7/2010	449	0	406	416
4/8/2010	449	0	420	418
4/9/2010	450	0	420	419
4/10/2010	450	0	423	421
4/11/2010	450	0	422	422
4/12/2010	450	0	236	423
4/13/2010	450	0	199	424
4/14/2010	450	0	212	424
4/15/2010	450	94	211	425
4/16/2010	450	117	254	427
4/17/2010	450	0	0	427
4/18/2010	450	0	3	427
4/19/2010	450	200	252	428
4/20/2010	451	295	112	430
4/21/2010	450	299	111	431
4/22/2010	449	299	112	432
4/23/2010	447	299	100	434
4/24/2010	296	299	0	434
4/25/2010	292	299	2	435
4/26/2010	296	299	126	435
4/27/2010	299	299	72	436
4/28/2010	300	299	71	437
4/29/2010	300	299	71	437
4/30/2010	300	299	71	438
Total	**10,592**	**3,696**	**4,492**	—

Date	East Delaware Tunnel	West Delaware Tunnel	Neversink Tunnel	Average June 1, 2009, to date
5/1/2010	300	299	0	439
5/2/2010	300	299	0	439
5/3/2010	300	299	0	440
5/4/2010	300	299	13	440
5/5/2010	300	299	0	441
5/6/2010	382	299	0	441
5/7/2010	394	299	25	442
5/8/2010	399	300	0	443
5/9/2010	400	300	0	444
5/10/2010	400	300	0	444
5/11/2010	329	300	0	445
5/12/2010	199	300	0	445
5/13/2010	0	299	0	445
5/14/2010	132	299	0	445
5/15/2010	225	299	0	445
5/16/2010	284	299	0	445
5/17/2010	375	299	0	446
5/18/2010	396	299	0	447
5/19/2010	216	299	0	447
5/20/2010	0	299	0	446
5/21/2010	247	299	0	447
5/22/2010	250	299	0	447
5/23/2010	250	299	0	447
5/24/2010	250	299	0	447
5/25/2010	206	299	0	448
5/26/2010	200	299	0	448
5/27/2010	200	275	0	448
5/28/2010	323	299	0	448
5/29/2010	349	299	0	449
5/30/2010	349	299	0	449
5/31/2010	349	299	0	450
Total	**8,604**	**9,250**	**38**	—

Table 6. Diversions to New York City water-supply system.—Continued

[River Master daily operations record. Million gallons per day for 24-hour period beginning 0800 local time. —, not applicable]

Date	East Delaware Tunnel	West Delaware Tunnel	Neversink Tunnel	Average June 1, 2009, to date
6/1/2010	259	35	0	450
6/2/2010	247	0	0	449
6/3/2010	240	0	0	448
6/4/2010	425	0	0	448
6/5/2010	443	199	0	449
6/6/2010	448	199	0	449
6/7/2010	445	199	0	450
6/8/2010	330	199	0	450
6/9/2010	449	199	0	451
6/10/2010	450	199	1	451
6/11/2010	450	199	205	452
6/12/2010	450	199	0	453
6/13/2010	450	199	1	453
6/14/2010	450	199	212	454
6/15/2010	450	199	204	455
6/16/2010	450	198	200	456
6/17/2010	450	198	0	457
6/18/2010	450	198	0	457
6/19/2010	450	198	0	458
6/20/2010	450	198	0	458
6/21/2010	450	198	0	459
6/22/2010	450	198	0	459
6/23/2010	450	198	0	460
6/24/2010	331	198	0	460
6/25/2010	450	198	0	461
6/26/2010	450	198	0	461
6/27/2010	450	198	0	462
6/28/2010	450	199	0	462
6/29/2010	449	198	0	463
6/30/2010	449	198	322	464
Total	**12,615**	**5,195**	**1,145**	—

Date	East Delaware Tunnel	West Delaware Tunnel	Neversink Tunnel	Average June 1, 2009, to date
7/1/2010	450	198	190	465
7/2/2010	450	198	101	465
7/3/2010	450	198	0	466
7/4/2010	450	198	0	466
7/5/2010	449	198	6	467
7/6/2010	444	198	115	468
7/7/2010	446	197	93	468
7/8/2010	449	199	100	469
7/9/2010	449	199	101	470
7/10/2010	449	199	107	470
7/11/2010	449	199	0	471
7/12/2010	449	199	99	471
7/13/2010	449	198	105	472
7/14/2010	449	198	104	473
7/15/2010	449	198	105	473
7/16/2010	450	198	105	474
7/17/2010	450	198	0	475
7/18/2010	450	198	2	475
7/19/2010	450	199	145	476
7/20/2010	450	198	143	477
7/21/2010	416	198	141	477
7/22/2010	400	198	142	478
7/23/2010	400	198	139	478
7/24/2010	400	198	0	479
7/25/2010	400	198	0	479
7/26/2010	400	198	146	480
7/27/2010	400	198	144	480
7/28/2010	400	198	142	481
7/29/2010	400	198	144	482
7/30/2010	400	198	136	482
7/31/2010	400	198	0	482
Total	**13,397**	**6,143**	**2,755**	—

Table 6. Diversions to New York City water-supply system.—Continued

[River Master daily operations record. Million gallons per day for 24-hour period beginning 0800 local time. —, not applicable]

Date	East Delaware Tunnel	West Delaware Tunnel	Neversink Tunnel	Average June 1, 2009, to date
8/1/2010	400	198	0	483
8/2/2010	369	8	0	482
8/3/2010	381	197	0	483
8/4/2010	446	299	0	483
8/5/2010	445	298	0	484
8/6/2010	445	298	0	484
8/7/2010	450	298	0	485
8/8/2010	450	294	0	486
8/9/2010	449	294	418	487
8/10/2010	449	299	420	489
8/11/2010	450	299	315	490
8/12/2010	331	298	310	491
8/13/2010	301	298	308	492
8/14/2010	301	297	304	493
8/15/2010	301	296	301	494
8/16/2010	300	298	145	494
8/17/2010	300	297	141	495
8/18/2010	300	297	140	496
8/19/2010	420	230	141	496
8/20/2010	450	200	141	497
8/21/2010	450	199	0	497
8/22/2010	450	199	3	498
8/23/2010	450	199	143	498
8/24/2010	450	125	145	499
8/25/2010	450	122	142	499
8/26/2010	450	129	0	499
8/27/2010	450	127	0	500
8/28/2010	450	100	0	500
8/29/2010	450	1	0	500
8/30/2010	449	299	0	500
8/31/2010	449	299	0	501
Total	**12,686**	**7,092**	**3,517**	—

Date	East Delaware Tunnel	West Delaware Tunnel	Neversink Tunnel	Average June 1, 2009, to date
9/1/2010	449	299	0	501
9/2/2010	449	299	0	502
9/3/2010	450	299	0	502
9/4/2010	450	298	0	503
9/5/2010	450	298	0	503
9/6/2010	450	298	0	504
9/7/2010	450	297	0	504
9/8/2010	450	297	0	505
9/9/2010	450	297	0	505
9/10/2010	450	300	0	506
9/11/2010	450	300	0	506
9/12/2010	447	299	0	507
9/13/2010	0	299	0	507
9/14/2010	359	299	0	507
9/15/2010	448	299	0	507
9/16/2010	450	298	1	508
9/17/2010	450	101	308	509
9/18/2010	450	100	0	509
9/19/2010	450	101	2	509
9/20/2010	450	101	311	510
9/21/2010	450	101	151	510
9/22/2010	449	101	154	510
9/23/2010	450	102	155	511
9/24/2010	449	101	354	512
9/25/2010	449	101	0	512
9/26/2010	449	101	0	512
9/27/2010	449	100	308	512
9/28/2010	450	101	153	513
9/29/2010	448	99	152	513
9/30/2010	0	0	0	512
Total	**12,495**	**6,086**	**2,049**	—

Table 6. Diversions to New York City water-supply system.—Continued

[River Master daily operations record. Million gallons per day for 24-hour period beginning 0800 local time. —, not applicable]

Date	East Delaware Tunnel	West Delaware Tunnel	Neversink Tunnel	Average June 1, 2009, to date
10/1/2010	0	0	0	511
10/2/2010	0	0	0	510
10/3/2010	0	0	0	509
10/4/2010	0	0	0	508
10/5/2010	440	0	0	508
10/6/2010	673	0	0	508
10/7/2010	674	0	0	509
10/8/2010	496	0	0	508
10/9/2010	499	0	0	508
10/10/2010	500	0	0	508
10/11/2010	499	0	0	508
10/12/2010	500	0	0	508
10/13/2010	454	0	0	508
10/14/2010	450	0	0	508
10/15/2010	450	155	244	509
10/16/2010	451	201	300	510
10/17/2010	451	201	298	511
10/18/2010	358	289	210	511
10/19/2010	350	300	204	512
10/20/2010	477	300	450	513
10/21/2010	500	301	501	515
10/22/2010	500	301	503	517
10/23/2010	500	301	505	518
10/24/2010	498	301	504	520
10/25/2010	5	11	0	519
10/26/2010	0	0	0	518
10/27/2010	5	0	0	517
10/28/2010	307	204	149	517
10/29/2010	450	299	378	518
10/30/2010	450	299	408	519
10/31/2010	450	299	414	521
Total	**11,387**	**3,762**	**5,068**	—

Date	East Delaware Tunnel	West Delaware Tunnel	Neversink Tunnel	Average June 1, 2009, to date
11/1/2010	8	11	0	520
11/2/2010	5	0	0	519
11/3/2010	346	199	0	519
11/4/2010	444	300	0	519
11/5/2010	500	300	0	520
11/6/2010	521	313	0	520
11/7/2010	500	300	0	521
11/8/2010	500	300	0	521
11/9/2010	461	300	0	522
11/10/2010	450	299	0	522
11/11/2010	450	299	0	523
11/12/2010	450	299	0	523
11/13/2010	450	300	0	523
11/14/2010	450	300	0	524
11/15/2010	450	300	0	524
11/16/2010	450	300	0	525
11/17/2010	448	300	0	525
11/18/2010	432	43	0	525
11/19/2010	450	0	0	525
11/20/2010	450	0	0	525
11/21/2010	450	0	0	525
11/22/2010	450	0	0	524
11/23/2010	450	76	465	525
11/24/2010	450	88	164	526
11/25/2010	450	105	4	526
11/26/2010	450	111	99	526
11/27/2010	450	110	0	526
11/28/2010	450	129	0	526
11/29/2010	450	102	145	526
11/30/2010	92	41	81	526
Total	**12,357**	**5,225**	**958**	—

Table 7. Consumption of water by New York City, 1950 to 2010.

[Data furnished by 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	358.6
1951	1,041.90	28.1	1,070.00	390.6
1952	1,087.00	32.7	1,119.70	409.8
1953	1,093.90	44.6	1,138.50	415.6
1954	1,063.40	46.3	1,109.70	405
1955	1,109.90	45.3	1,155.20	421.6
1956	1,111.30	48.9	1,160.20	424.6
1957	1,169.00	57.2	1,226.20	447.6
1958	1,152.90	49.6	1,202.50	438.9
1959	1,204.30	60.3	1,264.60	461.6
1960	1,199.40	58.9	1,258.30	460.5
1961	1,221.00	64	1,285.00	469
1962	1,207.60	68.8	1,276.40	465.9
1963	1,218.00	76.7	1,294.70	472.6
1964	1,189.20	79.4	1,268.60	464.3
1965	1,052.10	71.2	1,123.30	410
1966	1,044.90	73.2	1,118.10	408.1
1967	1,135.30	71	1,206.30	440.3
1968	1,242.00	78.2	1,320.20	483.2
1969	1,328.70	80.1	1,408.80	514.2
1970	1,400.30	90.4	1,490.70	544.1
1971	1,423.60	87.9	1,511.50	551.7
1972	1,412.40	83	1,495.40	547.3
1973	1,448.90	95.4	1,544.30	563.7
1974	1,441.80	96.3	1,538.10	561.4
1975	1,415.00	92.1	1,507.10	550.1
1976	1,435.00	95.8	1,530.80	560.3
1977	1,483.00	104.7	1,587.70	579.5
1978	1,479.40	103	1,582.40	577.6
1979	1,513.00	104.6	1,617.60	590.4
1980	1,506.30	110.1	1,616.30	591.6
1981	1,309.50	100	1,409.50	514.5
1982	1,383.00	104.8	1,487.80	543.1
1983	1,424.20	112.6	1,536.80	561
1984	1,465.20	113.9	1,579.10	578
1985	1,325.40	106.5	1,431.90	522.7
1986	1,351.10	115.2	1,466.30	535.2
1987	1,447.10	119.8	1,566.90	571.9
1988	1,484.30	125.6	1,609.90	589.1
1989	1,402.00	113.4	1,515.40	553.2
1990	1,424.40	122.4	1,546.80	564.6
1991	1,469.90	123.6	1,593.50	581.6

Table 7. Consumption of water by New York City, 1950 to 2010.—Continued

[Data furnished by 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)	
1992	1,368.70	113.9	1,482.60	542.6
1993	1,368.90	118.8	1,487.70	543
1994	1,357.80	119.2	1,477.00	539.1
1995	1,326.10	123.1	1,449.20	529
1996	1,283.50	120.2	1,403.70	512.4
1997	1,201.30	123.5	1,324.80	483.6
1998	1,220.00	124.7	1,344.70	490.8
1999	1,237.20	128.6	1,365.80	498.5
2000	1,240.40	124.9	1,365.30	499.7
2001	1,184.00	128.4	1,312.40	479
2002	1,135.60	121.1	1,256.70	458.7
2003	1,093.70	115.9	1,209.60	441.5
2004	1,099.60	117.5	1,217.10	445.5
2005	1,107.60	123.8	1,231.40	449.5
2006	1,069.20	116.8	1,186.00	432.9
2007	1,114.00	122.9	1,237.00	451.5
2008	1,082.90	114.8	1,197.70	438.4
2009	1,007.20	109.4	1,116.60	407.6
2010	1,039.00	119	1,158.00	422.7

Table 8. 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, 2010.

[U.S. Geological Survey published record. All values except totals are in million gallons per day, Mgal/d; total in million gallons, Mgal; —, not applicable]

Day	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.
1	78	96	[1]70	79	63	73	74	83	79	74	66	90
2	74	92	71	76	81	73	71	85	78	76	74	89
3	79	86	65	64	86	72	67	83	77	77	76	88
4	91	96	62	59	88	70	70	83	76	77	82	96
5	90	96	66	60	87	72	70	83	76	77	82	90
6	75	98	71	64	71	70	73	85	75	77	83	91
7	82	98	72	67	69	72	69	82	72	78	81	89
8	87	90	72	68	65	73	70	80	72	77	81	90
9	49	92	73	76	67	72	72	81	74	76	81	90
10	88	95	[1]72	75	61	74	76	77	75	74	80	89
11	101	96	[1]78	77	66	74	72	79	73	74	83	87
12	103	102	82	72	66	76	74	79	74	79	84	87
13	98	100	76	−9	69	75	74	88	74	78	80	87
14	72	100	75	−132	70	73	75	55	74	79	82	85
15	91	96	75	4	69	68	74	60	74	81	82	86
16	98	87	78	35	73	74	70	77	74	82	81	89
17	85	76	72	46	69	74	71	87	74	84	80	91
18	83	79	76	55	69	72	74	91	74	82	85	90
19	93	74	83	61	70	67	74	85	73	81	94	89
20	100	70	75	64	68	70	77	90	74	83	89	86
21	94	68	74	70	69	74	85	92	75	82	92	87
22	95	68	67	78	67	74	88	94	75	83	93	85
23	96	72	75	53	68	74	88	90	75	87	94	86
24	90	77	55	75	70	77	88	90	76	85	94	90
25	102	63	67	80	70	76	89	89	75	77	94	91
26	55	49	78	78	65	76	85	85	74	79	93	92
27	52	51	82	74	61	74	87	[1]82	74	82	93	89
28	90	52	81	79	70	72	87	[1]81	73	82	92	90
29	91	59	—	9	69	72	86	[1]79	74	82	91	90
30	86	[1]65	—	6	64	77	84	79	74	81	90	92
31	96	[1]69	—	38	—	77	—	79	75	—	91	—
Total[2]	**2,664**	**2,512**	**2,043**	**1,602**	**2,099**	**2,266**	**2,314**	**2,557**	**2,311**	**2,387**	**2,645**	**2,673**
Mean[3]	85.9	81	73	51.7	70	73.1	77.1	82.5	74.5	79.6	85.3	89.1

[1]Estimated.

[2]Year total is 28,073 Mgal.

[3]Year mean is 76.9 Mgal/d.

Table 9. New York City reservoir release design data.

[River Master daily operations record. Montague design rate = 1,750 cubic feet per second (ft^3/s) December 1, 2009, to November 30, 2010. Column (Col.) 1 and Col. 2 are furnished by power companies; Col. 3 is computed from index stations; Col. 4 is the increase in runoff computed on the basis of 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 = Col. 6 + Col. 7, when positive, otherwise Col. 8 =0; Col. 9 = Col. 7 from table 10; Col. 10 = summation of Col. 9; Col. 11 = design rate − (Col. 9 + Col. 10 from table 10), 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 ft^3/s]

Advance estimate of discharge of Delaware River at Montague, New Jersey, exclusive of New York City reservoir releases							Indicated deficiency	Balancing adjustment	Directed release (ft^3/s)	Computation of balancing adjustment					
Date of advance estimate	Powerplant release forecasts		Uncontrolled runoff		Montague date	Discharge (ft^3/s)				Adjusted directed release		Actual deficiency		Cumulative difference (ft^3/s)-d	Balancing adjustment (ft^3/s)
	Lake Wallenpaupack (ft^3/s)	Rio Reservoir (ft^3/s)	Current condition	Weather adjustment						Daily (ft^3/s)	Cumulative ([ft^3/s]-d)	Daily (ft^3/s)	Cumulative ([ft^3/s]-d)		
2010	Col. 1	Col. 2	Col. 3	Col. 4	2010	Col. 5	Col. 6	Col. 7	Col. 8	Col. 9	Col. 10	Col. 11	Col. 12	Col. 13	Col. 14
6/21	408	142	1,371	299	6/24	2,220	0	45	0	0	0	0	601	−601	50
6/22	408	0	1,235	398	6/25	2,041	0	50	0	0	0	0	601	−601	50
6/23	408	0	1,342	189	6/26	1,939	0	50	0	0	0	0	601	−601	50
6/24	0	0	1,258	344	6/27	1,602	148	50	198	198	198	388	989	−791	50
6/25	216	0	1,213	609	6/28	1,822	0	50	0	0	198	427	1,416	−1,218	50
6/26	331	0	1,077	898	6/29	2,306	0	50	0	0	198	235	1,651	−1,453	50
6/27	331	0	1,016	460	6/30	1,807	0	50	0	0	198	376	2,027	−1,829	50
6/28	331	160	989	91	7/1	1,571	179	50	229	229	427	516	2,543	−2,116	50
6/29	331	142	1,032	0	7/2	1,505	245	50	295	295	722	569	3,112	−2,390	50
6/30	331	0	855	0	7/3	1,186	564	50	614	606	1,328	636	3,748	−2,420	50
7/1	0	0	783	0	7/4	783	967	50	1,017	1,019	2,347	779	4,527	−2,180	50
7/2	299	0	736	0	7/5	1,035	715	50	765	766	3,113	646	5,173	−2,060	50
7/3	337	160	714	0	7/6	1,211	539	50	589	583	3,696	433	5,606	−1,910	50
7/4	337	142	697	0	7/7	1,176	574	50	624	627	4,323	427	6,033	−1,710	50
7/5	337	0	660	3	7/8	1,000	750	50	800	792	5,115	502	6,535	−1,420	50
7/6	337	0	659	30	7/9	1,026	724	50	774	774	5,889	681	7,216	−1,327	50
7/7	475	0	635	44	7/10	1,154	596	50	646	646	6,535	402	7,618	−1,083	50
7/8	0	0	603	2,197	7/11	2,800	0	50	0	0	6,535	482	8,100	−1,565	50
7/9	232	0	836	1,431	7/12	2,499	0	50	0	0	6,535	476	8,576	−2,041	50
7/10	363	0	813	293	7/13	1,469	281	50	331	331	6,866	455	9,031	−2,165	50
7/11	363	0	927	319	7/14	1,609	141	50	191	191	7,057	485	9,516	−2,459	50
7/12	363	0	743	370	7/15	1,476	274	50	324	324	7,381	535	10,051	−2,670	50
7/13	363	0	671	140	7/16	1,174	576	50	626	622	8,003	582	10,633	−2,630	50
7/14	445	106	712	263	7/17	1,526	224	50	274	274	8,277	425	11,058	−2,781	50
7/15	232	0	723	54	7/18	1,009	741	50	791	788	9,065	928	11,986	−2,921	50
7/16	232	0	663	100	7/19	995	755	50	805	806	9,871	582	10,633	−2,901	50

Table 9. New York City reservoir release design data.—Continued

[River Master daily operations record. Montague design rate = 1,750 cubic feet per second (ft^3/s) December 1, 2009, to November 30, 2010. Column (Col.) 1 and Col. 2 are furnished by power companies; Col. 3 is computed from index stations; Col. 4 is the increase in runoff computed on the basis of 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 = Col. 6 + Col. 7, when positive, otherwise Col. 8 =0; Col. 9 = Col. 7 from table 10; Col. 10 = summation of Col. 9; Col. 11 = design rate − (Col. 9 + Col. 10 from table 10), 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 ft^3/s]

Advance estimate of discharge of Delaware River at Montague, New Jersey, exclusive of New York City reservoir releases							Indicated deficiency	Balancing adjustment	Directed release (ft^3/s)	Computation of balancing adjustment					
Date of advance estimate	Powerplant release forecasts		Uncontrolled runoff		Montague date	Discharge (ft^3/s)				Adjusted directed release		Actual deficiency		Cumulative difference (ft^3/s)-d	Balancing adjustment (ft^3/s)
	Lake Wallenpaupack (ft^3/s)	Rio Reservoir (ft^3/s)	Current condition	Weather adjustment						Daily (ft^3/s)	Cumulative ([ft^3/s]-d)	Daily (ft^3/s)	Cumulative ([ft^3/s]-d)		
2010	Col. 1	Col. 2	Col. 3	Col. 4	2010	Col. 5	Col. 6	Col. 7	Col. 8	Col. 9	Col. 10	Col. 11	Col. 12	Col. 13	Col. 14
7/17	272	0	707	47	7/20	1,026	724	50	774	774	10,645	425	11,058	−2,751	50
7/18	272	0	664	128	7/21	1,064	686	50	736	734	11,379	928	11,986	−2,701	50
7/19	272	0	626	206	7/22	1,104	646	50	696	691	12,070	786	12,772	−2,691	50
7/20	272	0	727	106	7/23	1,105	645	50	695	693	12,763	624	13,396	−2,281	50
7/21	387	0	709	77	7/24	1,173	577	50	627	628	13,391	684	14,080	−1,653	50
7/22	216	0	1,079	305	7/25	1,600	150	50	200	200	13,591	681	14,761	−1,453	50
7/23	216	0	853	296	7/26	1,365	385	50	435	435	14,026	283	15,044	−1,018	50
7/24	118	0	1,420	271	7/27	1,809	0	50	0	0	14,026	0	15,044	−1,346	50
7/25	118	0	1,437	16	7/28	1,571	179	50	229	229	14,255	0	15,044	−1,725	50
7/26	118	0	1,305	0	7/29	1,423	327	50	377	377	14,632	0	15,044	−1,994	50
7/27	118	0	1,147	103	7/30	1,368	382	50	432	432	15,064	328	15,372	−2,438	50
7/28	239	0	938	42	7/31	1,219	531	50	581	582	15,646	608	15,980	−2,598	50
7/29	118	0	848	3	8/1	969	781	50	831	825	16,471	646	16,626	−2,748	50
7/30	118	0	620	57	8/2	795	955	50	1,005	1,004	17,475	876	17,502	−2,668	50
7/31	99	0	551	83	8/3	733	1,017	50	1,067	1,061	18,536	742	18,244	−2,648	50
8/1	99	0	489	189	8/4	777	973	50	1,023	1,122	19,658	975	19,219	−2,598	50
8/2	99	0	498	120	8/5	717	1,033	50	1,083	1,185	20,843	924	20,143	−2,508	50
8/3	99	0	501	95	8/6	695	1,055	50	1,105	1,204	22,047	1,041	21,184	−2,418	50
8/4	231	0	498	94	8/7	823	927	50	977	1,127	23,174	1,072	22,256	−2,238	50
8/5	99	71	499	31	8/8	700	1,050	50	1,100	1,204	24,378	1,095	23,351	−2,118	50
8/6	99	0	509	0	8/9	608	1,142	50	1,192	1,289	25,667	1,114	24,465	−2,008	50
8/7	81	0	443	2	8/10	526	1,224	50	1,274	1,372	27,039	947	25,412	−1,878	50
8/8	81	0	421	26	8/11	528	1,222	50	1,272	1,414	28,453	1,084	26,496	−1,728	50
8/9	81	0	389	6	8/12	476	1,274	50	1,324	1,413	29,866	1,179	27,675	−1,528	50
8/10	81	0	403	8	8/13	492	1,258	50	1,308	1,515	31,381	1,235	32,629	−1,248	50
8/11	81	0	390	31	8/14	502	1,248	50	1,298	1,496	32,877	1,336	33,965	−1,088	50

Table 9. New York City reservoir release design data.—Continued

[River Master daily operations record. Montague design rate = 1,750 cubic feet per second (ft^3/s) December 1, 2009, to November 30, 2010. Column (Col.) 1 and Col. 2 are furnished by power companies; Col. 3 is computed from index stations; Col. 4 is the increase in runoff computed on the basis of 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 = Col. 6 + Col. 7, when positive, otherwise Col. 8 =0; Col. 9 = Col. 7 from table 10; Col. 10 = summation of Col. 9; Col. 11 = design rate − (Col. 9 + Col. 10 from table 10), 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 ft^3/s]

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 (ft^3/s)	Indicated deficiency	Balancing adjustment	Directed release (ft^3/s)	Adjusted directed release		Actual deficiency		Cumulative difference (ft^3/s)-d	Balancing adjustment (ft^3/s)
	Lake Wallenpaupack (ft^3/s)	Rio Reservoir (ft^3/s)	Current condition	Weather adjustment						Daily (ft^3/s)	Cumulative ([ft^3/s]-d)	Daily (ft^3/s)	Cumulative ([ft^3/s]-d)		
2010	Col. 1	Col. 2	Col. 3	Col. 4	2010	Col. 5	Col. 6	Col. 7	Col. 8	Col. 9	Col. 10	Col. 11	Col. 12	Col. 13	Col. 14
8/12	81	0	363	57	8/15	501	1,249	50	1,299	1,300	34,177	1,280	35,245	−1,068	50
8/13	81	0	393	0	8/16	474	1,276	50	1,326	1,577	35,754	1,187	36,432	−678	50
8/14	27	0	416	31	8/17	474	1,276	50	1,326	1,422	37,176	832	37,264	−88	9
8/15	27	0	429	48	8/18	504	1,246	50	1,296	1,399	38,575	879	38,143	432	−43
8/16	27	0	513	28	8/19	568	1,182	50	1,232	1,332	39,907	1,132	39,275	632	−50
8/17	27	0	693	12	8/20	732	1,018	50	1,068	1,167	41,074	1,207	40,482	592	−50
8/18	27	0	594	5	8/21	626	1,124	50	1,174	1,170	42,244	1,210	41,692	552	−50
8/19	27	0	568	0	8/22	595	1,155	50	1,205	1,204	43,448	1,094	42,786	662	−50
8/20	27	0	539	39	8/23	605	1,145	50	1,195	1,292	44,740	0	42,786	1,954	−50
8/21	27	0	499	307	8/24	833	917	50	967	1,072	45,812	0	42,786	3,026	−50
8/22	27	0	607	602	8/25	1,236	514	50	564	664	46,476	0	42,786	3,690	−50
8/23	27	0	2,051	136	8/26	2,214	0	50	0	0	46,476	0	42,786	3,690	−50
8/24	27	0	1,750+	0	8/27	1,750+	0	20	0	0	46,476	0	42,786	3,690	−50
8/25	27	0	2,309	14	8/28	2,350	0	−50	0	0	46,476	0	42,786	3,690	−50
8/26	27	0	2,669	0	8/29	2,696	0	−50	0	0	46,476	0	42,786	3,690	−50
8/27	193	0	1,957	0	8/30	2,150	0	−50	0	0	46,476	20	42,806	3,670	−50
8/28	324	0	1,638	0	8/31	1,962	0	−50	0	0	46,476	58	42,864	3,612	−50
8/29	324	0	1,400	0	9/1	1,724	26	−50	−24	0	46,476	188	43,052	3,424	−50
8/30	324	0	1,216	0	9/2	1,540	210	−50	160	160	46,636	325	43,377	3,259	−50
8/31	324	0	707	0	9/3	1,031	719	−50	669	669	47,305	329	43,706	3,599	−50
9/1	324	0	707	8	9/4	1,039	711	−50	661	761	48,066	391	44,097	3,969	−50
9/2	0	0	662	4	9/5	666	1,084	−50	1,034	1,241	49,307	841	44,938	4,369	−50
9/3	0	0	635	1	9/6	636	1,114	−50	1,064	1,269	50,576	939	45,877	4,699	−50
9/4	0	0	635	1	9/7	636	1,114	−50	1,064	1,269	50,576	994	46,871	4,699	−50
9/5	0	0	659	0	9/8	659	1,091	−50	1,041	1,244	51,820	543	47,414	4,949	−50
9/6	353	0	613	0	9/9	966	784	−50	734	933	52,753	677	48,091	5,339	−50

Table 9. New York City reservoir release design data.—Continued

[River Master daily operations record. Montague design rate = 1,750 cubic feet per second (ft^3/s) December 1, 2009, to November 30, 2010. Column (Col.) 1 and Col. 2 are furnished by power companies; Col. 3 is computed from index stations; Col. 4 is the increase in runoff computed on the basis of 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 = Col. 6 + Col. 7, when positive, otherwise Col. 8 =0; Col. 9 = Col. 7 from table 10; Col. 10 = summation of Col. 9; Col. 11 = design rate − (Col. 9 + Col. 10 from table 10), 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 ft^3/s]

Advance estimate of discharge of Delaware River at Montague, New Jersey, exclusive of New York City reservoir releases							Indicated deficiency	Balancing adjustment	Directed release (ft^3/s)	Computation of balancing adjustment					
Date of advance estimate	Powerplant release forecasts		Uncontrolled runoff		Montague date	Discharge (ft^3/s)				Adjusted directed release		Actual deficiency		Cumulative difference (ft^3/s)-d	Balancing adjustment (ft^3/s)
	Lake Wallenpaupack (ft^3/s)	Rio Reservoir (ft^3/s)	Current condition	Weather adjustment						Daily (ft^3/s)	Cumulative ([ft^3/s]-d)	Daily (ft^3/s)	Cumulative ([ft^3/s]-d)		
2010	Col. 1	Col. 2	Col. 3	Col. 4	2010	Col. 5	Col. 6	Col. 7	Col. 8	Col. 9	Col. 10	Col. 11	Col. 12	Col. 13	Col. 14
9/7	353	0	615	6	9/10	974	776	−50	726	927	53,680	768	48,859	5,589	−50
9/8	353	0	576	14	9/11	943	807	−50	757	958	54,638	796	49,655	5,779	−50
9/9	353	0	521	1	9/12	875	875	−50	825	1,026	55,664	761	50,416	6,009	−50
9/10	147	0	488	2	9/13	637	1,113	−50	1,063	1,261	56,925	1,033	51,449	6,509	−50
9/11	0	0	480	31	9/14	511	1,239	−50	1,189	1,383	58,308	680	52,129	6,859	−50
9/12	235	0	479	32	9/15	746	1,004	−50	954	1,160	59,468	737	52,866	7,339	−50
9/13	235	0	455	34	9/16	724	1,026	−50	976	1,177	60,645	717	53,583	7,779	−50
9/14	235	0	479	19	9/17	733	1,017	−50	967	1,167	61,812	803	54,386	8,229	−50
9/15	235	0	539	126	9/18	900	850	−50	800	903	62,715	668	55,054	8,329	−50
9/16	235	0	520	216	9/19	971	779	−50	729	728	63,443	1,057	56,111	8,389	−50
9/17	0	0	471	330	9/20	801	949	−50	899	907	64,350	1,103	57,214	8,239	−50
9/18	0	0	694	3	9/21	697	1,053	−50	1,003	1,103	65,453	835	58,049	8,239	−50
9/19	206	0	693	4	9/22	903	847	−50	797	895	66,348	935	58,984	8,299	−50
9/20	206	0	654	1	9/23	861	889	−50	839	935	67,283	826	59,810	8,299	−50
9/21	206	0	653	22	9/24	881	869	−50	819	916	68,199	1,014	60,824	8,389	−50
9/22	206	0	523	13	9/25	742	1,008	−50	958	1,164	69,363	986	61,810	8,539	−50
9/23	206	0	512	35	9/26	753	997	−50	947	1,146	70,509	884	62,694	8,699	−50
9/24	248	0	504	1	9/27	753	997	−50	947	1,144	71,653	1,259	63,953	8,959	−50
9/25	0	0	499	0	9/28	499	1,251	−50	1,201	1,399	73,052	835	64,788	9,099	−50
9/26	206	0	524	213	9/29	943	807	−50	757	955	74,007	441	65,229	9,219	−50
9/27	206	0	520	1,066	9/30	1,792	0	−50	0	0	74,007	569	65,798	8,778	−50

Table 10. Controlled releases from reservoirs in the upper Delaware River Basin and segregation of flow of Delaware River at Montague, New Jersey.

[River Master daily operations record. Mean discharge in cubic feet per second for 24 hours. Column (Col.) 2, 24 hours beginning 1200 of date shown; Col. 3, 24 hours ending 2400 1 day later; Col. 4, 24 hours beginning 1500 1 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, Interim Excess Release Quantity (IERQ) releases to meet the Trenton, New Jersey, flow objective and releases to relieve thermal stress (Th); —, not applicable]

Controlled releases from New York City reservoirs					Controlled releases from power reservoirs			Segregation of flow, Delaware River at Montague, New Jersey						IERQ bank releases
Directed		Pepacton	Cannonsville	Neversink	Date	Lake Wallenpaupack	Rio Reservoir	Date	Controlled releases			Computed uncontrolled	Total	
									New York City reservoirs		Power-plants			
Date	Amount								Directed	Other				
2009	Col. 1	Col. 2	Col. 3	Col. 4	2009	Col. 5	Col. 6	2009	Col. 7	Col. 8	Col. 9	Col. 10	Col. 11	Col. 12
11/28	0	105	469	60	11/30	384	323	12/1	0	634	707	2,709	4,050	0
11/29	0	105	469	62	12/1	294	596	12/2	0	636	890	2,624	4,150	0
11/30	0	105	424	65	12/2	390	596	12/3	0	594	986	5,180	6,760	0
12/1	0	105	354	65	12/3	425	596	12/4	0	524	1,021	9,755	11,300	0
12/2	0	105	328	65	12/4	399	206	12/5	0	498	605	7,327	8,430	0
12/3	0	144	328	70	12/5	0	0	12/6	0	542	0	6,298	6,840	0
12/4	0	145	394	101	12/6	0	135	12/7	0	640	135	5,635	6,410	0
12/5	0	246	466	101	12/7	396	305	12/8	0	813	701	4,856	6,370	0
12/6	0	246	467	101	12/8	369	596	12/9	0	814	965	4,901	6,680	0
12/7	0	246	467	101	12/9	404	613	12/10	0	814	1,017	5,479	7,310	0
12/8	0	246	467	101	12/10	457	613	12/11	0	814	1,070	4,966	6,850	0
12/9	0	246	469	101	12/11	378	613	12/12	0	816	991	4,093	5,900	0
12/10	0	246	467	101	12/12	0	589	12/13	0	814	589	3,677	5,080	0
12/11	0	246	469	101	12/13	26	589	12/14	0	816	615	5379	6,810	0
12/12	0	246	467	101	12/14	307	589	12/15	0	814	896	7,090	8,800	0
12/13	0	246	469	101	12/15	485	589	12/16	0	816	1,074	7,070	8,960	0
12/14	0	246	469	101	12/16	893	589	12/17	0	816	1,482	6,392	8,690	0
12/15	0	246	469	101	12/17	789	571	12/18	0	816	1,360	5,064	7,240	0
12/16	0	246	469	127	12/18	718	589	12/19	0	842	1,307	5,141	7,290	0
12/17	0	263	571	190	12/19	482	489	12/20	0	1,024	971	5,195	7,190	0
12/18	0	381	821	189	12/20	384	457	12/21	0	1,391	841	4,698	6,930	0
12/19	0	492	1,006	190	12/21	570	195	12/22	0	1,688	765	4,527	6,980	0
12/20	0	568	1,296	101	12/22	813	195	12/23	0	1,965	1,008	4,177	7,150	0
12/21	0	605	1,494	101	12/23	750	0	12/24	0	2,200	750	3,830	6,780	0
12/22	0	701	1,501	101	12/24	541	0	12/25	0	2,303	541	3,166	6,010	0
12/23	0	699	1,497	101	12/25	377	0	12/26	0	2,297	377	3,136	5,810	0

Table 10. 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 operations record. Mean discharge in cubic feet per second for 24 hours. Column (Col.) 2, 24 hours beginning 1200 of date shown; Col. 3, 24 hours ending 2400 1 day later; Col. 4, 24 hours beginning 1500 1 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, Interim Excess Release Quantity (IERQ) releases to meet the Trenton, New Jersey, flow objective and releases to relieve thermal stress (Th); —, not applicable]

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	IERQ bank releases
									New York City reservoirs		Power-plants			
Date	Amount								Directed	Other				
2009/2010	Col. 1	Col. 2	Col. 3	Col. 4	2009/2010	Col. 5	Col. 6	2009/2010	Col. 7	Col. 8	Col. 9	Col. 10	Col. 11	Col. 12
12/24	0	699	1,497	101	12/26	269	135	12/27	0	2,297	404	7,899	10,600	0
12/25	0	699	1,497	101	12/27	252	199	12/28	0	2,297	451	10,352	13,100	0
12/26	0	701	1,494	101	12/28	1,091	408	12/29	0	2,296	1,499	7,405	11,200	0
12/27	0	701	1,400	101	12/29	746	291	12/30	0	2,202	1,037	5,741	8,980	0
12/28	0	701	845	101	12/30	1,002	443	12/31	0	1,647	1,445	4,838	7,930	0
12/29	0	701	476	101	12/31	849	291	1/1	0	1,278	1,140	4,842	7,260	0
12/30	0	701	472	130	1/1	479	220	1/2	0	1,303	699	4,598	6,600	0
12/31	0	701	472	187	1/2	415	220	1/3	0	1,360	635	4,285	6,280	0
1/1	0	701	472	189	1/3	630	344	1/4	0	1,362	974	3,324	5,660	0
1/2	0	701	473	192	1/4	766	582	1/5	0	1,366	1,348	3,406	6,120	0
1/3	0	701	470	192	1/5	640	546	1/6	0	1,363	1,186	3,721	6,270	0
1/4	0	701	472	190	1/6	765	514	1/7	0	1,363	1,279	3,598	6,240	0
1/5	0	701	472	190	1/7	624	238	1/8	0	1,363	862	3,245	5,470	0
1/6	0	701	512	184	1/8	638	152	1/9	0	1,397	790	3,263	5,450	0
1/7	0	699	763	99	1/9	507	152	1/10	0	1,561	659	2,650	4,870	0
1/8	0	701	1,024	99	1/10	598	85	1/11	0	1,824	683	2,603	5,110	0
1/9	0	701	1,292	107	1/11	587	71	1/12	0	2,100	658	3,012	5,770	0
1/10	0	701	1,493	121	1/12	717	177	1/13	0	2,315	894	3,141	6,350	0
1/11	0	699	1,497	121	1/13	621	266	1/14	0	2,317	887	2,736	5,940	0
1/12	0	679	1,497	121	1/14	688	142	1/15	0	2,297	830	2,413	5,540	0
1/13	0	376	1,496	121	1/15	419	0	1/16	0	1,993	419	2,298	4,710	0
1/14	0	246	1,499	121	1/16	316	0	1/17	0	1,866	316	2,358	4,540	0
1/15	0	246	1,499	121	1/17	294	160	1/18	0	1,866	454	3,060	5,380	0
1/16	0	246	1,338	121	1/18	900	142	1/19	0	1,705	1,042	4,453	7,200	0
1/17	0	246	866	121	1/19	1,230	0	1/20	0	1,233	1,230	3,977	6,440	0

Table 10. 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 operations record. Mean discharge in cubic feet per second for 24 hours. Column (Col.) 2, 24 hours beginning 1200 of date shown; Col. 3, 24 hours ending 2400 1 day later; Col. 4, 24 hours beginning 1500 1 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, Interim Excess Release Quantity (IERQ) releases to meet the Trenton, New Jersey, flow objective and releases to relieve thermal stress (Th); —, not applicable]

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	IERQ bank releases
									New York City reservoirs		Power-plants			
Date	Amount								Directed	Other				
2010	Col. 1	Col. 2	Col. 3	Col. 4	2010	Col. 5	Col. 6	2010	Col. 7	Col. 8	Col. 9	Col. 10	Col. 11	Col. 12
1/18	0	246	493	121	1/20	1,293	0	1/21	0	860	1,293	3,527	5,680	0
1/19	0	246	467	121	1/21	887	160	1/22	0	834	1,047	3,169	5,050	0
1/20	0	246	470	139	1/22	404	142	1/23	0	855	546	2,829	4,230	0
1/21	0	260	634	190	1/23	312	0	1/24	0	1,084	312	3,004	4,400	0
1/22	0	430	1,157	190	1/24	355	227	1/25	0	1,777	582	6,631	8,990	0
1/23	0	622	1,488	190	1/25	834	833	1/26	0	2,300	1,667	34,933	38,900	0
1/24	0	701	1,273	192	1/26	886	833	1/27	0	2,166	1,719	19,615	23,500	0
1/25	0	292	647	192	1/27	1,016	833	1/28	0	1,131	1,849	13,820	16,800	0
1/26	0	554	1,354	190	1/28	875	833	1/29	0	2,098	1,708	9,394	13,200	0
1/27	0	701	1,496	190	1/29	938	191	1/30	0	2,387	1,129	7,484	11,000	0
1/28	0	701	1,497	189	1/30	998	0	1/31	0	2,387	998	5,825	9,210	0
1/29	0	702	1,499	190	1/31	791	53	2/1	0	2,391	844	5,375	8,610	0
1/30	0	702	1,499	190	2/1	723	213	2/2	0	2,391	936	5,323	8,650	0
1/31	0	702	1,374	189	2/2	684	248	2/3	0	2,265	932	4,153	7,350	0
2/1	0	702	908	190	2/3	431	248	2/4	0	1,800	679	3,911	6,390	0
2/2	0	701	503	190	2/4	362	248	2/5	0	1,394	610	3,826	5,830	0
2/3	0	701	469	105	2/5	384	106	2/6	0	1,275	490	3,575	5,340	0
2/4	0	701	469	101	2/6	358	0	2/7	0	1,271	358	3,461	5,090	0
2/5	0	699	469	101	2/7	297	142	2/8	0	1,269	439	3,162	4,870	0
2/6	0	702	469	101	2/8	369	426	2/9	0	1,272	795	2,963	5,030	0
2/7	0	702	469	91	2/9	365	426	2/10	0	1,262	791	3,197	5,250	0
2/8	0	702	469	65	2/10	502	426	2/11	0	1,236	928	2,946	5,110	0
2/9	0	701	469	65	2/11	405	426	2/12	0	1,235	831	2,724	4,790	0
2/10	0	701	470	65	2/12	390	106	2/13	0	1,236	496	2,558	4,290	0
2/11	0	701	469	65	2/13	311	0	2/14	0	1,235	311	2,614	4,160	0
2/12	0	701	469	65	2/14	347	142	2/15	0	1,235	489	2,636	4,360	0

Table 10. 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 operations record. Mean discharge in cubic feet per second for 24 hours. Column (Col.) 2, 24 hours beginning 1200 of date shown; Col. 3, 24 hours ending 2400 1 day later; Col. 4, 24 hours beginning 1500 1 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, Interim Excess Release Quantity (IERQ) releases to meet the Trenton, New Jersey, flow objective and releases to relieve thermal stress (Th); —, not applicable]

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	IERQ bank releases
									New York City reservoirs		Power-plants			
Date	Amount								Directed	Other				
2010	Col. 1	Col. 2	Col. 3	Col. 4	2010	Col. 5	Col. 6	2010	Col. 7	Col. 8	Col. 9	Col. 10	Col. 11	Col. 12
2/13	0	701	469	65	2/15	525	266	2/16	0	1,235	791	2,374	4,400	0
2/14	0	701	469	65	2/16	487	142	2/17	0	1,235	629	2,326	4,190	0
2/15	0	701	469	65	2/17	495	0	2/18	0	1,235	495	2,280	4,010	0
2/16	0	688	469	65	2/18	489	160	2/19	0	1,222	649	2,099	3,970	0
2/17	0	501	470	65	2/19	296	142	2/20	0	1,036	438	2,076	3,550	0
2/18	0	261	470	65	2/20	315	0	2/21	0	796	315	2,069	3,180	0
2/19	0	186	470	65	2/21	283	0	2/22	0	721	283	2,036	3,040	0
2/20	0	186	470	65	2/22	505	0	2/23	0	721	505	2,064	3,290	0
2/21	0	186	469	65	2/23	508	0	2/24	0	720	508	2,272	3,500	0
2/22	0	186	470	65	2/24	786	160	2/25	0	721	946	2,453	4,120	0
2/23	0	184	514	101	2/25	854	266	2/26	0	799	1,120	2,501	4,420	0
2/24	0	186	852	108	2/26	1,523	89	2/27	0	1,146	1,612	2,822	5,580	0
2/25	0	212	1,264	190	2/27	1,632	0	2/28	0	1,672	1,632	2,916	6,220	0
2/26	0	377	1,493	190	2/28	1,548	124	3/1	0	2,252	1,672	2,406	6,330	0
2/27	0	453	1,497	190	3/1	828	213	3/2	0	2,402	1,041	2,137	5,580	0
2/28	0	699	1,493	190	3/2	701	89	3/3	0	2,382	790	2,248	5,420	0
3/1	0	699	1,497	190	3/3	687	0	3/4	0	2,386	687	2,437	5,510	0
3/2	0	701	1,499	161	3/4	774	160	3/5	0	2,361	934	2,415	5,710	0
3/3	0	701	1,499	101	3/5	499	142	3/6	0	2,301	641	2,528	5,470	0
3/4	0	701	1,497	101	3/6	0	0	3/7	0	2,299	0	2,681	4,980	0
3/5	0	701	1,499	101	3/7	0	0	3/8	0	2,301	0	3,109	5,410	0
3/6	0	701	1,499	101	3/8	445	160	3/9	0	2,301	605	3,794	6,700	0
3/7	0	701	1,501	101	3/9	322	142	3/10	0	2,303	464	5,063	7,830	0
3/8	0	702	1,497	101	3/10	373	0	3/11	0	2,300	373	5,987	8,660	0
3/9	0	701	1,497	118	3/11	458	195	3/12	0	2,316	653	9,931	12,900	0

Table 10. 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 operations record. Mean discharge in cubic feet per second for 24 hours. Column (Col.) 2, 24 hours beginning 1200 of date shown; Col. 3, 24 hours ending 2400 1 day later; Col. 4, 24 hours beginning 1500 1 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, Interim Excess Release Quantity (IERQ) releases to meet the Trenton, New Jersey, flow objective and releases to relieve thermal stress (Th); —, not applicable]

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	IERQ bank releases
									New York City reservoirs		Power-plants			
Date	Amount								Directed	Other				
2010	Col. 1	Col. 2	Col. 3	Col. 4	2010	Col. 5	Col. 6	2010	Col. 7	Col. 8	Col. 9	Col. 10	Col. 11	Col. 12
3/10	0	503	1,493	190	3/12	413	851	3/13	0	2,186	1,264	15,050	18,500	0
3/11	0	696	1,494	190	3/13	0	585	3/14	0	2,380	585	27,935	30,900	0
3/12	0	701	1,497	178	3/14	0	851	3/15	0	2,376	851	28,973	32,200	0
3/13	0	673	1,437	190	3/15	389	851	3/16	0	2,300	1,240	22,260	25,800	0
3/14	0	701	1,510	183	3/16	401	851	3/17	0	2,394	1,252	17,254	20,900	0
3/15	0	701	1,462	118	3/17	755	851	3/18	0	2,281	1,606	14,013	17,900	0
3/16	0	600	1,301	65	3/18	677	851	3/19	0	1,966	1,528	12,206	15,700	0
3/17	0	597	1,146	65	3/19	1,027	851	3/20	0	1,808	1,878	10,614	14,300	0
3/18	0	500	950	65	3/20	935	851	3/21	0	1,515	1,786	9,599	12,900	0
3/19	0	511	857	65	3/21	836	851	3/22	0	1,433	1,687	8,880	12,000	0
3/20	0	393	699	65	3/22	1,623	851	3/23	0	1,157	2,474	21,969	25,600	0
3/21	0	399	548	94	3/23	1,671	851	3/24	0	1,041	2,522	32,137	35,700	0
3/22	0	254	368	190	3/24	1,675	851	3/25	0	812	2,526	24,862	28,200	0
3/23	0	65	390	190	3/25	1,382	851	3/26	0	645	2,233	20,422	23,300	0
3/24	0	65	534	190	3/26	710	851	3/27	0	789	1,561	17,850	20,200	0
3/25	0	65	679	190	3/27	623	851	3/28	0	934	1,474	14,692	17,100	0
3/26	0	65	832	190	3/28	748	851	3/29	0	1,087	1,599	16,514	19,200	0
3/27	0	65	992	166	3/29	1,621	851	3/30	0	1,223	2,472	20,405	24,100	0
3/28	0	179	1,118	54	3/30	1,625	851	3/31	0	1,351	2,476	33,273	37,100	0
3/29	0	65	1,197	158	3/31	1,674	851	4/1	0	1,420	2,525	29,555	33,500	0
3/30	0	79	1,476	190	4/1	1,671	816	4/2	0	1,745	2,487	21,368	25,600	0
3/31	0	65	1,497	190	4/2	1,119	851	4/3	0	1,752	1,970	16,378	20,100	0
4/1	0	65	1,493	190	4/3	515	851	4/4	0	1,748	1,366	13,686	16,800	0
4/2	0	65	1,497	189	4/4	447	851	4/5	0	1,751	1,298	11,551	14,600	0
4/3	0	65	1,497	190	4/5	547	709	4/6	0	1,754	1,256	9,690	12,700	0

Table 10. 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 operations record. Mean discharge in cubic feet per second for 24 hours. Column (Col.) 2, 24 hours beginning 1200 of date shown; Col. 3, 24 hours ending 2400 1 day later; Col. 4, 24 hours beginning 1500 1 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, Interim Excess Release Quantity (IERQ) releases to meet the Trenton, New Jersey, flow objective and releases to relieve thermal stress (Th); —, not applicable]

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	IERQ bank releases
									New York City reservoirs		Power-plants			
Date	Amount								Directed	Other				
2010	Col. 1	Col. 2	Col. 3	Col. 4	2010	Col. 5	Col. 6	2010	Col. 7	Col. 8	Col. 9	Col. 10	Col. 11	Col. 12
4/4	0	80	1,496	189	4/6	556	674	4/7	0	1,765	1,230	8,105	11,100	0
4/5	0	238	1,496	190	4/7	461	479	4/8	0	1,924	940	6,636	9,500	0
4/6	0	442	1,496	173	4/8	613	106	4/9	0	2,111	719	6,200	9,030	0
4/7	0	637	1,499	65	4/9	446	0	4/10	0	2,201	446	5,913	8,560	0
4/8	0	699	1,499	65	4/10	0	0	4/11	0	2,263	0	4,907	7,170	0
4/9	0	701	1,501	65	4/11	13	53	4/12	0	2,267	66	4,307	6,640	0
4/10	0	688	1,388	65	4/12	364	124	4/13	0	2,141	488	3,361	5,990	0
4/11	0	524	1,044	65	4/13	462	195	4/14	0	1,633	657	3,330	5,620	0
4/12	0	365	914	65	4/14	482	266	4/15	0	1,344	748	3,138	5,230	0
4/13	0	226	886	65	4/15	520	266	4/16	0	1,177	786	3,007	4,970	0
4/14	0	145	760	65	4/16	373	124	4/17	0	970	497	3,723	5,190	0
4/15	0	141	637	65	4/17	0	71	4/18	0	843	71	4,606	5,520	0
4/16	0	84	497	65	4/18	0	142	4/19	0	646	142	4,022	4,810	0
4/17	0	84	265	65	4/19	466	266	4/20	0	414	732	3,494	4,640	0
4/18	0	84	170	65	4/20	430	266	4/21	0	319	696	3,215	4,230	0
4/19	0	84	152	65	4/21	407	266	4/22	0	301	673	3,056	4,030	0
4/20	0	84	172	65	4/22	748	266	4/23	0	321	1,014	2,825	4,160	0
4/21	0	84	172	65	4/23	340	124	4/24	0	321	464	2,605	3,390	0
4/22	0	85	172	65	4/24	0	0	4/25	0	322	0	3,048	3,370	0
4/23	0	85	172	65	4/25	0	142	4/26	0	322	142	4,656	5,120	0
4/24	0	84	172	65	4/26	0	266	4/27	0	321	266	8,123	8,710	0
4/25	0	85	172	65	4/27	641	266	4/28	0	322	907	8,141	9,370	0
4/26	0	85	172	65	4/28	515	266	4/29	0	322	781	6,097	7,200	0
4/27	0	85	192	65	4/29	0	248	4/30	0	342	248	5,340	5,930	0
4/28	0	85	265	65	4/30	0	213	5/1	0	415	213	4,752	5,380	0

Table 10. 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 operations record. Mean discharge in cubic feet per second for 24 hours. Column (Col.) 2, 24 hours beginning 1200 of date shown; Col. 3, 24 hours ending 2400 1 day later; Col. 4, 24 hours beginning 1500 1 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, Interim Excess Release Quantity (IERQ) releases to meet the Trenton, New Jersey, flow objective and releases to relieve thermal stress (Th); —, not applicable]

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	IERQ bank releases
									New York City reservoirs		Power-plants			
Date	Amount								Directed	Other				
2010	Col. 1	Col. 2	Col. 3	Col. 4	2010	Col. 5	Col. 6	2010	Col. 7	Col. 8	Col. 9	Col. 10	Col. 11	Col. 12
4/29	0	85	308	68	5/1	0	71	5/2	0	461	71	4,278	4,810	0
4/30	0	88	376	76	5/2	0	142	5/3	0	540	142	4,118	4,800	0
5/1	0	101	381	76	5/3	346	266	5/4	0	558	612	3,810	4,980	0
5/2	0	101	347	76	5/4	314	266	5/5	0	524	580	3,626	4,730	0
5/3	0	101	325	76	5/5	311	266	5/6	0	502	577	3,311	4,390	0
5/4	0	101	305	76	5/6	336	284	5/7	0	482	620	2,898	4,000	0
5/5	0	101	278	76	5/7	265	142	5/8	0	455	407	2,738	3,600	0
5/6	0	101	224	76	5/8	0	0	5/9	0	401	0	3,259	3,660	0
5/7	0	101	190	76	5/9	0	142	5/10	0	367	142	3,361	3,870	0
5/8	0	101	190	76	5/10	0	284	5/11	0	367	284	2,869	3,520	0
5/9	0	101	190	76	5/11	10	301	5/12	0	367	311	2,962	3,640	0
5/10	0	102	190	76	5/12	486	142	5/13	0	368	628	3,874	4,870	0
5/11	0	101	190	76	5/13	402	0	5/14	0	367	402	3,751	4,250	0
5/12	0	101	190	76	5/14	80	0	5/15	0	367	80	3,523	3,970	0
5/13	0	101	190	76	5/15	0	174	5/16	0	367	174	3,219	3,760	0
5/14	0	101	190	76	5/16	0	142	5/17	0	367	142	2,921	3,430	0
5/15	0	101	192	76	5/17	0	142	5/18	0	369	142	2,809	3,320	0
5/16	0	101	190	76	5/18	0	177	5/19	0	367	177	3,426	3,970	0
5/17	0	101	190	76	5/19	328	177	5/20	0	367	505	3,288	4,160	0
5/18	0	101	190	76	5/20	359	89	5/21	0	367	448	2,935	3,750	0
5/19	0	101	190	80	5/21	322	89	5/22	0	371	411	2,508	3,290	0
5/20	0	105	243	90	5/22	0	0	5/23	0	438	0	2,332	2,770	0
5/21	0	125	261	90	5/23	0	0	5/24	0	476	0	2,204	2,680	0
5/22	0	124	246	90	5/24	0	0	5/25	0	460	0	2,120	2,580	0
5/23	0	124	238	90	5/25	0	160	5/26	0	462	160	1,988	2,610	0

Table 10. 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 operations record. Mean discharge in cubic feet per second for 24 hours. Column (Col.) 2, 24 hours beginning 1200 of date shown; Col. 3, 24 hours ending 2400 1 day later; Col. 4, 24 hours beginning 1500 1 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, Interim Excess Release Quantity (IERQ) releases to meet the Trenton, New Jersey, flow objective and releases to relieve thermal stress (Th); —, not applicable]

Controlled releases from New York City reservoirs					Controlled releases from power reservoirs			Segregation of flow, Delaware River at Montague, New Jersey						IERQ bank releases
Directed		Pepacton	Cannonsville	Neversink	Date	Lake Wallenpaupack	Rio Reservoir	Date	Controlled releases			Computed uncontrolled	Total	
									New York City reservoirs		Power-plants			
Date	Amount								Directed	Other				
2010	Col. 1	Col. 2	Col. 3	Col. 4	2010	Col. 5	Col. 6	2010	Col. 7	Col. 8	Col. 9	Col. 10	Col. 11	Col. 12
5/24	0	124	240	90	5/26	475	142	5/27	0	454	617	1,819	2,890	0
5/25	0	125	238	90	5/27	474	0	5/28	0	453	474	1,803	2,730	0
5/26	0	125	238	90	5/28	18	71	5/29	0	453	89	1,818	2,360	0
5/27	0	125	238	90	5/29	0	0	5/30	0	453	0	1,797	2,250	0
5/28	0	125	238	90	5/30	61	160	5/31	0	453	221	1,766	2,440	0
5/29	0	125	238	90	5/31	199	142	6/1	0	453	341	1,576	2,370	0
5/30	0	125	238	93	6/1	410	0	6/2	0	456	410	1,584	2,450	0
5/31	0	127	297	99	6/2	385	0	6/3	0	523	385	1,542	2,450	0
6/1	0	139	326	101	6/3	430	160	6/4	0	566	590	1,414	2,570	0
6/2	0	139	326	101	6/4	242	142	6/5	0	566	384	1,240	2,190	0
6/3	0	139	326	101	6/5	196	0	6/6	0	566	196	1,228	1,990	0
6/4	0	139	326	101	6/6	154	0	6/7	0	566	154	1,610	2,330	0
6/5	0	139	326	101	6/7	323	160	6/8	0	566	483	1,621	2,670	0
6/6	0	139	326	101	6/8	219	142	6/9	0	566	361	1,513	2,440	0
6/7	0	139	326	101	6/9	247	0	6/10	0	566	247	1,887	2,700	0
6/8	0	139	326	99	6/10	290	0	6/11	0	564	290	2,456	3,310	0
6/9	0	139	325	99	6/11	110	0	6/12	0	563	110	2,057	2,730	0
6/10	0	139	326	99	6/12	0	106	6/13	0	564	106	2,840	3,510	0
6/11	0	139	326	101	6/13	36	0	6/14	0	566	36	5,608	6,210	0
6/12	0	139	325	101	6/14	526	160	6/15	0	565	686	3,789	5,040	0
6/13	0	139	325	101	6/15	323	142	6/16	0	565	465	2,840	3,870	0
6/14	0	139	351	101	6/16	394	0	6/17	0	591	394	2,415	3,400	0
6/15	0	139	408	101	6/17	207	160	6/18	0	648	367	2,215	3,230	0
6/16	0	139	412	101	6/18	312	142	6/19	0	652	454	2,014	3,120	0
6/17	0	139	415	101	6/19	153	0	6/20	0	655	153	1,832	2,640	0

Table 10. 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 operations record. Mean discharge in cubic feet per second for 24 hours. Column (Col.) 2, 24 hours beginning 1200 of date shown; Col. 3, 24 hours ending 2400 1 day later; Col. 4, 24 hours beginning 1500 1 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, Interim Excess Release Quantity (IERQ) releases to meet the Trenton, New Jersey, flow objective and releases to relieve thermal stress (Th); —, not applicable]

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	IERQ bank releases
									New York City reservoirs		Power-plants			
Date	Amount								Directed	Other				
2010	Col. 1	Col. 2	Col. 3	Col. 4	2010	Col. 5	Col. 6	2010	Col. 7	Col. 8	Col. 9	Col. 10	Col. 11	Col. 12
6/18	0	138	421	101	6/20	264	0	6/21	0	660	264	1,346	2,270	0
6/19	0	139	419	101	6/21	444	0	6/22	0	659	444	1,297	2,400	0
6/20	0	141	418	101	6/22	423	0	6/23	0	660	423	1,417	2,500	0
6/21	0	139	419	101	6/23	372	160	6/24	0	659	532	1,299	2,490	0
6/22	0	139	418	101	6/24	434	142	6/25	0	658	576	1,426	2,660	0
6/23	0	139	418	101	6/25	419	71	6/26	0	658	490	1,372	2,520	0
6/24	198	139	418	101	6/26	195	0	6/27	198	460	195	1,167	2,020	0
6/25	0	138	418	101	6/27	209	0	6/28	0	657	209	1,114	1,980	0
6/26	0	139	415	101	6/28	431	0	6/29	0	655	431	1,084	2,170	0
6/27	0	139	416	101	6/29	231	160	6/30	0	656	391	983	2,030	0
6/28	229	139	416	101	6/30	175	142	7/1	229	427	317	917	1,890	0
6/29	295	139	379	101	7/1	312	0	7/2	295	324	312	869	1,800	0
6/30	614	139	325	142	7/2	255	0	7/3	606	0	255	859	1,720	0
7/1	1,017	139	775	105	7/3	270	0	7/4	1,019	0	270	701	1,990	0
7/2	765	139	526	101	7/4	370	0	7/5	766	0	370	734	1,870	0
7/3	589	139	343	101	7/5	510	71	7/6	583	0	581	736	1,900	0
7/4	624	159	367	101	7/6	404	230	7/7	627	0	634	689	1,950	0
7/5	800	179	512	101	7/7	477	195	7/8	792	0	672	576	2,040	0
7/6	774	176	514	101	7/8	457	0	7/9	774	17	457	612	1,860	17 (Th)
7/7	646	139	524	99	7/9	560	0	7/10	646	116	560	788	2,110	116 (Th)
7/8	0	139	521	102	7/10	150	71	7/11	0	762	221	1,047	2,030	196 (Th)
7/9	0	139	326	101	7/11	245	0	7/12	0	566	245	1,029	1,840	0
7/10	331	139	325	101	7/12	406	0	7/13	331	234	406	889	1,860	0
7/11	191	139	325	101	7/13	342	89	7/14	191	374	431	834	1,830	0
7/12	324	139	325	101	7/14	316	89	7/15	324	241	405	810	1,780	0

Table 10. 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 operations record. Mean discharge in cubic feet per second for 24 hours. Column (Col.) 2, 24 hours beginning 1200 of date shown; Col. 3, 24 hours ending 2400 1 day later; Col. 4, 24 hours beginning 1500 1 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, Interim Excess Release Quantity (IERQ) releases to meet the Trenton, New Jersey, flow objective and releases to relieve thermal stress (Th); —, not applicable]

Controlled releases from New York City reservoirs					Controlled releases from power reservoirs			Segregation of flow, Delaware River at Montague, New Jersey						IERQ bank releases
Directed		Pepacton	Cannonsville	Neversink	Date	Lake Wallenpaupack	Rio Reservoir	Date	Controlled releases			Computed uncontrolled	Total	
									New York City reservoirs		Power-plants			
Date	Amount								Directed	Other				
2010	Col. 1	Col. 2	Col. 3	Col. 4	2010	Col. 5	Col. 6	2010	Col. 7	Col. 8	Col. 9	Col. 10	Col. 11	Col. 12
7/13	626	139	382	101	7/15	294	113	7/16	622	0	407	761	1,790	0
7/14	274	139	325	101	7/16	466	131	7/17	274	291	597	728	1,890	0
7/15	791	139	548	101	7/17	195	0	7/18	788	0	195	627	1,610	0
7/16	805	139	566	101	7/18	234	0	7/19	806	0	234	730	1,770	0
7/17	774	139	534	101	7/19	328	0	7/20	774	0	328	798	1,900	0
7/18	736	138	495	101	7/20	268	0	7/21	734	0	268	798	1,800	0
7/19	696	138	452	101	7/21	218	0	7/22	691	0	218	851	1,760	0
7/20	695	139	453	101	7/22	192	0	7/23	693	0	192	1,275	2,160	0
7/21	627	139	388	101	7/23	353	106	7/24	628	0	459	1,673	2,760	0
7/22	200	139	328	101	7/24	118	0	7/25	200	368	118	1,934	2,620	0
7/23	435	139	328	101	7/25	86	0	7/26	435	133	86	1,696	2,350	0
7/24	0	139	328	101	7/26	114	0	7/27	0	568	114	1,308	1,990	0
7/25	229	139	328	101	7/27	116	0	7/28	229	339	116	1,026	1,710	0
7/26	377	139	326	101	7/28	116	121	7/29	377	189	237	867	1,670	0
7/27	432	139	326	101	7/29	110	0	7/30	432	134	110	764	1,440	0
7/28	581	139	342	101	7/30	367	0	7/31	582	0	367	641	1,590	0
7/29	831	139	585	101	7/31	118	0	8/1	825	0	118	657	1,600	0
7/30	1,005	139	764	101	8/1	169	0	8/2	1,004	0	169	657	1,830	0
7/31	1,067	139	821	101	8/2	99	0	8/3	1,061	0	99	610	1,770	0
8/1	1,023	139	882	101	8/3	102	0	8/4	1,122	0	102	576	1,800	100
8/2	1,083	139	945	101	8/4	99	0	8/5	1,185	0	99	556	1,840	100
8/3	1,105	139	964	101	8/5	97	0	8/6	1,204	0	97	539	1,840	100
8/4	977	138	888	101	8/6	274	0	8/7	1,127	0	274	529	1,930	150
8/5	1,100	139	964	101	8/7	104	89	8/8	1,204	0	193	473	1,870	100
8/6	1,192	139	1,049	101	8/8	88	0	8/9	1,289	0	88	483	1,860	100

Table 10. 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 operations record. Mean discharge in cubic feet per second for 24 hours. Column (Col.) 2, 24 hours beginning 1200 of date shown; Col. 3, 24 hours ending 2400 1 day later; Col. 4, 24 hours beginning 1500 1 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, Interim Excess Release Quantity (IERQ) releases to meet the Trenton, New Jersey, flow objective and releases to relieve thermal stress (Th); —, not applicable]

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	IERQ bank releases
									New York City reservoirs		Power-plants			
Date	Amount								Directed	Other				
2010	Col. 1	Col. 2	Col. 3	Col. 4	2010	Col. 5	Col. 6	2010	Col. 7	Col. 8	Col. 9	Col. 10	Col. 11	Col. 12
8/7	1,274	139	1,132	101	8/9	79	0	8/10	1,372	0	79	429	1,880	100
8/8	1,272	139	1,174	101	8/10	79	0	8/11	1,414	0	79	407	1,900	150
8/9	1,324	139	1,173	101	8/11	97	0	8/12	1,413	0	97	440	1,950	100
8/10	1,308	139	1,275	101	8/12	79	0	8/13	1,515	0	79	436	2,030	200
8/11	1,298	139	1,256	101	8/13	9	0	8/14	1,496	0	9	405	1,910	200
8/12	1,299	139	1,060	101	8/14	0	0	8/15	1,300	0	0	470	1,770	0
8/13	1,326	139	1,337	101	8/15	35	0	8/16	1,577	0	35	528	2,140	250
8/14	1,326	139	1,182	101	8/16	51	0	8/17	1,422	0	51	867	2,340	100
8/15	1,296	139	1,159	101	8/17	43	0	8/18	1,399	0	43	828	2,270	100
8/16	1,232	139	1,092	101	8/18	31	0	8/19	1,332	0	31	587	1,950	100
8/17	1,068	139	927	101	8/19	31	0	8/20	1,167	0	31	512	1,710	100
8/18	1,174	139	930	101	8/20	27	71	8/21	1,170	0	98	442	1,710	0
8/19	1,205	139	964	101	8/21	13	0	8/22	1,204	0	13	643	1,860	0
8/20	1,195	139	1,052	101	8/22	0	0	8/23	1,292	0	0	2,058	3,350	100
8/21	967	139	832	101	8/23	0	0	8/24	1,072	0	0	6,778	7,850	100
8/22	564	139	424	101	8/24	0	0	8/25	664	0	0	4,726	5,390	100
8/23	0	139	316	101	8/25	18	0	8/26	0	556	18	4,146	4,720	0
8/24	0	139	325	101	8/26	0	0	8/27	0	565	0	3,205	3,770	0
8/25	0	139	322	101	8/27	0	0	8/28	0	562	0	2,338	2,900	0
8/26	0	139	322	101	8/28	0	0	8/29	0	562	0	1,868	2,430	0
8/27	0	139	330	101	8/29	168	0	8/30	0	570	168	1,562	2,300	0
8/28	0	139	328	101	8/30	338	0	8/31	0	568	338	1,354	2,260	0
8/29	0	139	328	101	8/31	350	0	9/1	0	568	350	1,212	2,130	0
8/30	160	139	325	101	9/1	338	0	9/2	160	405	338	1,087	1,990	0
8/31	669	139	429	101	9/2	418	0	9/3	669	0	418	1,003	2,090	0

Table 10. 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 operations record. Mean discharge in cubic feet per second for 24 hours. Column (Col.) 2, 24 hours beginning 1200 of date shown; Col. 3, 24 hours ending 2400 1 day later; Col. 4, 24 hours beginning 1500 1 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, Interim Excess Release Quantity (IERQ) releases to meet the Trenton, New Jersey, flow objective and releases to relieve thermal stress (Th); —, not applicable]

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	IERQ bank releases
									New York City reservoirs		Power-plants			
Date	Amount								Directed	Other				
2010	Col. 1	Col. 2	Col. 3	Col. 4	2010	Col. 5	Col. 6	2010	Col. 7	Col. 8	Col. 9	Col. 10	Col. 11	Col. 12
9/1	661	139	521	101	9/3	375	0	9/4	761	0	375	984	2,120	100
9/2	1,034	141	999	101	9/4	0	71	9/5	1,241	0	71	838	2,150	200
9/3	1,064	139	1,029	101	9/5	0	0	9/6	1,269	0	0	811	2,080	200
9/4	1,041	139	1,004	101	9/6	0	0	9/7	1,244	0	0	756	2,000	200
9/5	734	139	693	101	9/7	421	0	9/8	933	0	421	786	2,140	200
9/6	726	139	687	101	9/8	352	0	9/9	927	0	352	721	2,000	200
9/7	757	139	718	101	9/9	297	0	9/10	958	0	297	685	1,940	200
9/8	825	139	786	101	9/10	269	0	9/11	1,026	0	269	685	1,980	200
9/9	1,063	139	1,021	101	9/11	268	0	9/12	1,261	0	268	721	2,250	200
9/10	1,189	139	1,143	101	9/12	0	0	9/13	1,383	0	0	717	2,100	200
9/11	954	139	920	101	9/13	245	0	9/14	1,160	0	245	825	2,230	200
9/12	976	139	937	101	9/14	264	0	9/15	1,177	0	264	749	2,190	200
9/13	967	139	927	101	9/15	236	0	9/16	1,167	0	236	797	2,200	200
9/14	800	139	674	90	9/16	185	0	9/17	903	0	185	762	1,850	100
9/15	729	130	528	70	9/17	203	106	9/18	728	0	309	773	1,810	0
9/16	899	85	752	70	9/18	0	0	9/19	907	0	0	693	1,600	0
9/17	1,003	85	948	70	9/19	0	0	9/20	1,103	0	0	647	1,750	100
9/18	797	84	741	70	9/20	267	0	9/21	895	0	267	648	1,810	100
9/19	839	85	780	70	9/21	210	0	9/22	935	0	210	605	1,750	100
9/20	819	85	763	68	9/22	309	0	9/23	916	0	309	615	1,840	100
9/21	958	85	1,009	70	9/23	142	0	9/24	1164	0	142	594	1,900	200
9/22	947	87	989	70	9/24	171	0	9/25	1146	0	171	593	1,910	200
9/23	947	85	989	70	9/25	286	0	9/26	1144	0	286	580	2,010	200
9/24	1201	85	1,244	70	9/26	0	0	9/27	1399	0	0	491	1,890	200
9/25	757	85	800	70	9/27	156	0	9/28	955	0	156	759	1,870	177

Table 10. 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 operations record. Mean discharge in cubic feet per second for 24 hours. Column (Col.) 2, 24 hours beginning 1200 of date shown; Col. 3, 24 hours ending 2400 1 day later; Col. 4, 24 hours beginning 1500 1 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, Interim Excess Release Quantity (IERQ) releases to meet the Trenton, New Jersey, flow objective and releases to relieve thermal stress (Th); —, not applicable]

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	IERQ bank releases
									New York City reservoirs		Power-plants			
Date	Amount								Directed	Other				
2010	Col. 1	Col. 2	Col. 3	Col. 4	2010	Col. 5	Col. 6	2010	Col. 7	Col. 8	Col. 9	Col. 10	Col. 11	Col. 12
9/26	0	85	116	70	9/28	114	0	9/29	0	271	114	1,195	1,580	0
9/27	0	85	114	70	9/29	0	0	9/30	0	269	0	1,181	1,450	0
9/28	0	85	114	70	9/30	780	248	10/1	0	269	1,028	47,303	48,600	0
9/29	0	85	114	62	10/1	0	851	10/2	0	261	851	45,588	46,700	0
9/30	0	85	93	45	10/2	415	851	10/3	0	223	1,266	17,511	19,000	0
10/1	0	60	84	45	10/3	1,171	851	10/4	0	189	2,022	10,689	12,900	0
10/2	0	60	80	45	10/4	1,268	851	10/5	0	185	2,119	10,796	13,100	0
10/3	0	60	79	45	10/5	1,345	851	10/6	0	184	2,196	14,620	17,000	0
10/4	0	60	80	45	10/6	1,311	532	10/7	0	185	1,843	10,872	12,900	0
10/5	0	60	111	45	10/7	1,264	319	10/8	0	216	1,583	8,141	9,940	0
10/6	0	60	130	45	10/8	1,281	230	10/9	0	235	1,511	6,334	8,080	0
10/7	0	60	131	45	10/9	1,277	160	10/10	0	236	1,437	5,107	6,780	0
10/8	0	60	131	45	10/10	1,224	301	10/11	0	236	1,525	4,369	6,130	0
10/9	0	60	133	45	10/11	1,106	319	10/12	0	238	1,425	4,157	5,820	0
10/10	0	60	131	45	10/12	1,274	372	10/13	0	236	1,646	4,338	6,220	0
10/11	0	60	131	50	10/13	1,290	426	10/14	0	241	1,716	3,583	5,540	0
10/12	0	63	149	60	10/14	1,293	426	10/15	0	272	1,719	3,709	5,700	0
10/13	0	85	159	60	10/15	1,295	230	10/16	0	304	1,525	4,471	6,300	0
10/14	0	85	159	60	10/16	1,279	213	10/17	0	304	1,492	6,144	7,940	0
10/15	0	85	158	60	10/17	858	124	10/18	0	303	982	4,965	6,250	0
10/16	0	85	161	60	10/18	0	213	10/19	0	306	213	4,331	4,850	0
10/17	0	85	159	60	10/19	0	213	10/20	0	304	213	3,793	4,310	0
10/18	0	85	161	60	10/20	0	106	10/21	0	306	106	3,408	3,820	0
10/19	0	85	162	60	10/21	0	89	10/22	0	307	89	3,124	3,520	0
10/20	0	85	161	60	10/22	0	106	10/23	0	306	106	2,828	3,240	0
10/21	0	85	159	60	10/23	0	0	10/24	0	304	0	2,656	2,960	0

Table 10. 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 operations record. Mean discharge in cubic feet per second for 24 hours. Column (Col.) 2, 24 hours beginning 1200 of date shown; Col. 3, 24 hours ending 2400 1 day later; Col. 4, 24 hours beginning 1500 1 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, Interim Excess Release Quantity (IERQ) releases to meet the Trenton, New Jersey, flow objective and releases to relieve thermal stress (Th); —, not applicable]

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	IERQ bank releases
									New York City reservoirs		Power-plants			
Date	Amount								Directed	Other				
2010	Col. 1	Col. 2	Col. 3	Col. 4	2010	Col. 5	Col. 6	2010	Col. 7	Col. 8	Col. 9	Col. 10	Col. 11	Col. 12
10/22	0	85	159	60	10/24	0	89	10/25	0	304	89	2,507	2,900	0
10/23	0	85	159	60	10/25	0	0	10/26	0	304	0	2,496	2,800	0
10/24	0	85	158	60	10/26	0	0	10/27	0	303	0	3,067	3,370	0
10/25	0	85	158	60	10/27	0	0	10/28	0	303	0	5,457	5,760	0
10/26	0	85	158	60	10/28	0	0	10/29	0	303	0	4,737	5,040	0
10/27	0	85	158	60	10/29	0	0	10/30	0	303	0	3,887	4,190	0
10/28	0	85	159	60	10/30	0	71	10/31	0	304	71	3,435	3,810	0
10/29	0	85	162	60	10/31	0	0	11/1	0	307	0	3,143	3,450	0
10/30	0	85	161	60	11/1	0	124	11/2	0	306	124	2,900	3,330	0
10/31	0	85	161	60	11/2	0	195	11/3	0	306	195	2,639	3,140	0
11/1	0	85	159	60	11/3	0	195	11/4	0	304	195	2,701	3,200	0
11/2	0	85	158	60	11/4	0	160	11/5	0	303	160	4,937	5,400	0
11/3	0	85	181	60	11/5	0	106	11/6	0	326	106	5,568	6,000	0
11/4	0	85	201	60	11/6	0	0	11/7	0	346	0	4,604	4,950	0
11/5	0	85	203	62	11/7	0	0	11/8	0	350	0	4,110	4,460	0
11/6	0	88	210	60	11/8	0	195	11/9	0	358	195	3,707	4,260	0
11/7	0	85	203	60	11/9	0	195	11/10	0	348	195	3,677	4,220	0
11/8	0	85	201	60	11/10	0	106	11/11	0	346	106	3,468	3,920	0
11/9	0	85	200	60	11/11	0	89	11/12	0	345	89	3,256	3,690	0
11/10	0	85	200	60	11/12	0	71	11/13	0	345	71	3,004	3,420	0
11/11	0	85	200	60	11/13	0	0	11/14	0	345	0	2,855	3,200	0
11/12	0	85	203	60	11/14	0	0	11/15	0	348	0	2,732	3,080	0
11/13	0	85	201	60	11/15	0	35	11/16	0	346	35	2,689	3,070	0
11/14	0	85	201	60	11/16	0	177	11/17	0	346	177	4,207	4,730	0
11/15	0	85	201	60	11/17	0	177	11/18	0	346	177	7,557	8,080	0

Table 10. 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 operations record. Mean discharge in cubic feet per second for 24 hours. Column (Col.) 2, 24 hours beginning 1200 of date shown; Col. 3, 24 hours ending 2400 1 day later; Col. 4, 24 hours beginning 1500 1 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, Interim Excess Release Quantity (IERQ) releases to meet the Trenton, New Jersey, flow objective and releases to relieve thermal stress (Th); —, not applicable]

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	IERQ bank releases
									New York City reservoirs		Power-plants			
Date	Amount								Directed	Other				
2010	Col. 1	Col. 2	Col. 3	Col. 4	2010	Col. 5	Col. 6	2010	Col. 7	Col. 8	Col. 9	Col. 10	Col. 11	Col. 12
11/16	0	85	201	60	11/18	0	195	11/19	0	346	195	6,279	6,820	0
11/17	0	85	201	60	11/19	0	106	11/20	0	346	106	5,148	5,600	0
11/18	0	87	200	60	11/20	0	0	11/21	0	347	0	4,593	4,940	0
11/19	0	87	200	60	11/21	0	124	11/22	0	347	124	4,159	4,630	0
11/20	0	85	203	60	11/22	344	230	11/23	0	348	574	3,428	4,350	0
11/21	0	85	201	60	11/23	1,276	369	11/24	0	346	1,645	3,819	5,810	0
11/22	0	85	203	60	11/24	1,668	191	11/25	0	348	1,859	3,253	5,460	0
11/23	0	85	204	60	11/25	1,673	124	11/26	0	349	1,797	3,554	5,700	0
11/24	0	85	203	60	11/26	1,671	106	11/27	0	348	1,777	4,875	7,000	0
11/25	0	85	200	60	11/27	1,675	0	11/28	0	345	1,675	4,500	6,520	0
11/26	0	85	198	60	11/28	1,679	124	11/29	0	343	1,803	3,884	6,030	0
11/27	0	85	200	60	11/29	1,127	383	11/30	0	345	1,510	3,395	5,250	0
Monthly totals														
Dec. 2009	**0**	**10,976**	**23,300**	**3,204**	—	**14,391**	**12,109**	—	**0**	**37,480**	**26,500**	**168,600**	**232,580**	**0**
Jan. 2010	**0**	**16,848**	**29,531**	**4,732**	—	**21,481**	**8,354**	—	**0**	**51,111**	**29,835**	**177,214**	**258,160**	**0**
Feb. 2010	**0**	**15,405**	**17,799**	**2,822**	—	**15,417**	**4,435**	—	**0**	**36,026**	**19,852**	**82,712**	**138,590**	**0**
Mar. 2010	**0**	**16,024**	**37,275**	**4,283**	—	**23,746**	**17,128**	—	**0**	**57,582**	**40,874**	**413,644**	**512,100**	**0**
Apr. 2010	**0**	**6,303**	**25,755**	**3,024**	—	**13,810**	**9,805**	—	**0**	**35,082**	**23,615**	**214,083**	**272,780**	**0**
May 2010	**0**	**3,280**	**7,471**	**2,467**	—	**4,587**	**4,042**	—	**0**	**13,218**	**8,629**	**91,883**	**113,460**	**0**
June 2010	**198**	**4,130**	**10,774**	**3,003**	—	**8,578**	**1,989**	—	**198**	**17,709**	**10,567**	**55,786**	**84,260**	**0**
July 2010	**15,477**	**4,404**	**12,952**	**3,175**	—	**8,824**	**1,358**	—	**15,448**	**5,083**	**10,182**	**28,567**	**59,280**	**329 (Th)**
Aug. 2010	**28,511**	**4,308**	**26,774**	**3,131**	—	**2,248**	**160**	—	**30,830**	**3,383**	**2,408**	**40,109**	**76,730**	**2,350**
Sept. 2010	**23,516**	**3,516**	**22,914**	**2,614**	—	**5,876**	**177**	—	**27,531**	**1,513**	**6,053**	**23,513**	**58,610**	**3,977**
Oct. 2010	**0**	**2,338**	**4,239**	**1,697**	—	**19,731**	**9,042**	—	**0**	**8,274**	**28,773**	**258,423**	**295,470**	**0**
Nov. 2010	**0**	**2,557**	**5,820**	**1,802**	—	**11,113**	**3,777**	—	**0**	**10,179**	**14,890**	**118,641**	**143,710**	**0**

Table 11. Daily mean discharge of the East Branch Delaware River at Downsville, New York (station number 01417000), for report year ending November 30, 2010.

[U.S. Geological Survey published record. All values except totals are in cubic feet per second, ft^3/s; totals are in cubic feet per second day, (ft^3/s)-d: —, not applicable]

Day	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.
1	96	680	680	680	3,950	90	133	137	139	140	69	82
2	95	680	680	680	3,120	95	139	137	139	142	56	82
3	112	680	680	680	2,730	95	139	137	139	143	56	82
4	132	680	680	680	2,450	93	139	138	139	142	55	82
5	178	680	680	680	2,010	92	139	182	139	141	56	82
6	229	680	683	680	1,440	92	140	181	140	141	56	82
7	235	680	692	681	1,170	92	139	153	140	141	56	82
8	244	680	692	686	971	93	139	138	140	141	56	82
9	250	680	690	689	876	93	140	137	140	141	56	82
10	251	680	680	661	744	94	139	137	140	141	57	82
11	251	680	680	518	615	95	139	138	140	142	57	82
12	252	680	680	687	423	94	140	137	140	142	58	82
13	252	552	680	686	287	92	139	136	142	142	73	82
14	252	268	682	691	152	93	139	134	143	142	80	82
15	252	250	687	690	139	92	139	133	143	143	80	82
16	251	250	680	640	104	92	138	133	143	96	80	82
17	251	251	604	598	82	92	136	132	143	76	80	82
18	314	251	381	541	82	94	134	132	142	76	80	82
19	420	252	198	496	81	95	132	132	142	76	80	82
20	530	251	190	451	80	94	137	135	141	76	80	82
21	546	251	191	406	80	114	136	137	141	76	80	82
22	668	324	191	352	80	123	135	136	142	78	80	81
23	680	518	192	4,270	82	122	135	137	141	78	80	81
24	680	668	192	6,430	81	119	135	136	142	78	80	80
25	680	590	240	4,420	79	119	135	136	143	78	80	81
26	676	249	424	3,390	79	119	137	135	142	78	80	81
27	679	676	671	2,610	80	119	138	137	142	78	80	80
28	680	680	680	2,170	80	119	137	137	141	78	80	80
29	679	680	—	2,270	80	119	136	138	140	78	82	81
30	680	679	—	2,690	80	118	137	139	140	80	82	81
31	680	680	—	4,550	—	119	—	139	140	—	82	—
Total[1]	**12,175**	**16,480**	**15,080**	**46,353**	**22,307**	**3,176**	**4,120**	**4,326**	**4,368**	**3,299**	**2,208**	**2,455**
Mean[2]	392.7	531.6	538.6	1,495.3	743.6	102.5	137.3	139.5	140.9	110.0	71.2	81.8

[1]Year total is 136,347 (ft^3/s)-d.

[2]Year mean is 373.8 ft^3/s.

Table 12. Daily mean discharge of the West Branch Delaware River at Stilesville, New York (station number 01425000), for report year ending November 30, 2010.

[U.S. Geological Survey published record. All values except totals are in cubic feet per second, ft^3/s; totals are in cubic feet per second day (ft^3/s)-d; —, not applicable]

Day	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.
1	431	476	1,410	1,540	4,020	513	317	339	769	386	146	195
2	366	471	943	1,540	3,620	485	340	776	837	448	113	195
3	338	464	512	1,540	3,120	434	340	514	899	932	110	194
4	336	463	463	1,540	2,700	397	340	356	915	962	109	212
5	388	463	463	1,540	2,310	355	340	371	843	935	116	229
6	463	463	463	1,540	1,990	316	341	492	898	609	137	229
7	466	491	463	1,550	1,780	261	339	497	977	608	160	228
8	471	733	463	1,550	1,630	245	339	510	1,070	631	160	228
9	465	1,010	463	1,550	1,560	277	343	508	1,120	707	160	228
10	463	1,280	463	1,550	1,520	280	342	341	1,120	954	161	227
11	463	1,510	463	1,550	1,390	269	340	336	1,210	1,090	161	227
12	463	1,520	463	1,550	1,050	279	343	332	1,190	861	162	227
13	466	1,520	463	1,570	923	293	343	331	999	876	176	227
14	471	1,520	463	1,570	890	305	340	376	1,270	860	187	228
15	469	1,540	463	1,580	759	332	361	337	1,110	591	189	231
16	469	1,540	471	1,530	625	329	416	511	1,090	465	189	232
17	470	1,380	467	1,340	492	318	419	524	1,020	679	188	235
18	512	898	467	1,180	291	304	422	490	863	884	188	232
19	751	501	469	1,050	205	296	427	473	865	672	188	232
20	996	470	468	883	179	287	427	442	898	700	189	232
21	1,280	463	468	709	206	303	427	440	982	694	189	232
22	1,520	599	471	557	205	292	434	380	765	940	188	232
23	1,540	1,130	471	398	206	275	433	328	387	932	188	232
24	1,540	1,520	498	2,010	208	270	432	326	298	923	188	234
25	1,540	1,360	840	3,450	210	272	429	326	306	1,180	188	234
26	1,540	632	1,270	3,670	212	271	427	325	302	738	188	230
27	1,540	1,350	1,530	3,380	212	270	427	326	302	146	196	227
28	1,440	1,530	1,540	2,920	255	271	430	322	308	136	193	227
29	870	1,530	—	2,690	375	272	423	333	307	135	194	227
30	487	1,540	—	2,620	455	272	388	531	308	154	198	227
31	478	1,540	—	3,770	—	273	—	710	305	—	197	—
Total[1]	**23,492**	**31,907**	**17,851**	**55,417**	**33,598**	**9,616**	**11,469**	**13,203**	**24,533**	**20,828**	**5,296**	**6,770**
Mean[2]	757.8	1,029.3	637.5	1,787.6	1,119.9	310.2	382.3	425.9	791.4	694.3	170.8	225.7

[1]Year total is 253,980 (ft^3/s)-d.

[2]Year mean is 694.4 ft^3/s.

Table 13. Daily mean discharge of the Neversink River at Neversink, New York (station number 01436000), for report year ending November 30, 2010.

[All values except totals are in cubic feet per second, ft^3/s; totals are in cubic feet per second day (ft^3/s)-d; —, not applicable]

Day	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.
1	64	157	178	175	1,320	72	95	97	95	96	51	60
2	67	179	178	177	1,090	75	96	142	95	95	41	60
3	67	179	178	177	1,040	75	96	96	95	96	42	60
4	67	184	152	119	960	75	96	95	98	94	42	60
5	85	184	95	93	758	74	95	96	98	95	42	60
6	101	183	95	93	561	72	96	96	98	95	43	60
7	100	184	93	94	301	73	95	96	101	96	43	60
8	99	147	93	94	128	72	95	96	101	97	43	59
9	100	99	73	94	73	70	96	96	101	97	42	60
10	99	100	60	94	72	72	95	96	101	98	43	60
11	99	113	59	142	67	73	96	96	98	98	43	60
12	100	116	59	182	67	73	96	96	98	98	43	60
13	101	115	59	181	67	73	96	96	98	98	53	60
14	101	116	60	182	67	73	96	93	98	98	59	62
15	101	116	60	182	67	72	96	94	98	97	57	62
16	99	116	60	152	67	73	96	94	98	76	56	63
17	97	116	60	92	66	73	96	94	98	66	57	62
18	156	116	59	64	65	73	98	94	98	67	58	63
19	186	116	57	64	64	73	98	95	98	67	59	63
20	183	116	57	64	65	73	98	95	98	66	60	62
21	152	116	58	66	65	83	98	96	98	66	60	62
22	98	157	58	68	65	88	98	95	98	67	59	62
23	98	182	59	1,230	64	88	98	96	98	67	60	62
24	98	182	70	1,640	65	88	98	95	96	67	60	61
25	99	182	93	989	65	88	98	95	96	66	61	62
26	100	181	130	904	65	88	98	94	95	67	61	62
27	101	180	177	672	64	88	98	95	95	67	61	62
28	100	179	177	523	63	88	98	95	96	67	60	62
29	96	176	—	1,550	62	88	97	95	95	67	60	62
30	98	177	—	1,800	62	88	97	94	95	68	60	63
31	98	178	—	2,200	—	88	—	95	95	—	60	—
Total[1]	**3,208**	**4,641**	**2,607**	**14,158**	**7,607**	**2,421**	**2,893**	**2,995**	**3,026**	**2,457**	**1,640**	**1,843**
Mean[2]	103.5	149.7	93.1	456.7	253.6	78.1	96.4	96.6	97.6	81.9	52.9	61.4

[1]Year total is 49,496 (ft^3/s)-d.

[2]Year mean is 135.1 ft^3/s.

Table 14. Daily mean discharge of the Delaware River at Montague, New Jersey (station number 01438500), for report year ending November 30, 2010.

[U.S. Geological Survey published record. All values except totals are in cubic feet per second, ft^3/s; totals are in cubic feet per second day (ft^3/s)-d; —, not applicable]

Day	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.
1	4,050	7,260	[1]7,580	6,330	33,100	5,380	2,660	1,920	1,600	2,040	48,600	3,450
2	4,150	6,600	[1]7,950	5,580	25,300	4,810	2,740	1,840	1,830	1,900	46,700	3,330
3	6,760	[1]5,650	7,350	5,420	20,100	4,800	2,740	1,760	1,770	2,000	19,000	3,140
4	11,300	[1]5,600	6,390	5,510	16,800	4,980	2,870	2,020	1,800	2,030	12,900	3,200
5	8,430	[1]6,100	5,830	5,710	14,600	4,730	2,470	1,900	1,840	2,060	13,100	5,400
6	6,840	6,270	[1]5,090	5,470	12,700	4,390	2,260	1,930	1,840	1,990	17,000	6,000
7	6,410	6,240	[1]4,190	4,980	11,100	4,000	2,490	1,980	1,930	1,910	12,900	4,950
8	6,370	5,470	[1]4,340	5,410	9,500	3,600	2,670	2,070	1,870	2,050	9,940	4,460
9	6,680	[1]4,790	5,030	6,700	9,030	3,660	2,420	1,900	1,860	1,910	8,080	4,260
10	7,310	[1]4,060	5,250	7,830	8,560	3,870	2,680	2,150	1,880	1,860	6,780	4,220
11	6,850	[1]4,150	5,110	8,660	7,170	3,520	3,280	2,060	1,900	1,900	6,130	3,920
12	5,900	[1]4,990	4,790	12,900	6,640	3,640	2,680	1,840	1,950	2,160	5,820	3,690
13	5,080	[1]5,370	4,290	18,500	5,990	4,870	3,460	1,860	2,030	2,010	6,220	3,420
14	6,810	[1]5,500	4,160	30,900	5,620	4,520	6,180	1,830	1,910	2,140	5,540	3,200
15	8,800	5,540	4,360	32,200	5,230	3,970	4,990	1,780	1,770	2,100	5,700	3,080
16	8,960	4,710	4,400	25,800	4,970	3,760	3,790	1,790	2,140	2,110	6,300	3,070
17	8,690	4,540	4,190	20,900	5,190	3,430	3,300	1,890	2,340	1,760	7,940	4,730
18	7,240	5,380	4,010	17,900	5,520	3,320	3,120	1,610	2,270	1,720	6,250	8,080
19	7,290	7,200	3,970	15,700	4,810	3,970	3,000	1,770	1,950	1,520	4,850	6,820
20	[1]6,760	6,440	3,550	14,300	4,640	4,160	2,500	1,900	1,710	1,670	4,310	5,600
21	[1]6,590	5,680	3,180	12,900	4,230	3,750	2,380	1,800	1,710	1,730	3,820	4,940
22	[1]6,490	5,050	3,040	12,100	4,030	3,290	2,510	1,760	1,880	1,660	3,520	4,630
23	[1]6,280	4,230	3,290	27,300	4,160	2,770	2,590	2,160	3,420	1,760	3,240	4,350
24	[1]6,390	4,400	3,500	35,700	3,390	2,680	2,570	2,750	7,860	1,820	2,960	5,810
25	[1]5,340	9,440	4,120	28,200	3,370	2,580	2,730	2,620	5,460	1,830	2,900	5,460
26	5,810	39,400	4,420	23,300	5,120	2,610	2,580	2,350	4,820	1,920	2,800	5,700
27	10,600	23,500	5,580	20,200	8,710	2,890	2,070	1,990	3,690	1,800	3,370	7,000
28	13,100	16,800	6,220	17,100	9,370	2,730	2,020	1,710	2,810	1,780	5,760	6,520
29	11,200	[1]12,200	—	19,300	7,200	2,360	2,200	1,670	2,340	1,500	5,040	6,030
30	8,980	[1]9,220	—	24,500	5,930	2,250	2,060	1,440	2,210	1,380	4,190	5,250
31	7,930	[1]7,620	—	37,400	—	2,440	—	1,590	2,170	—	3,810	—
Total[2]	**229,390**	**249,400**	**135,180**	**514,700**	**272,080**	**113,730**	**86,010**	**59,640**	**76,560**	**56,020**	**295,470**	**143,710**
Mean[3]	7,400	8,045	4,828	16,603	9,069	3,669	2,867	1,924	2,470	1,867	9,531	4,790

[1]Estimated.

[2]Year total is 2,231,890 (ft^3/s)-d.

[3]Year mean is 6,089 ft^3/s.

Quality of Water in the Delaware Estuary

This section describes water-quality monitoring programs for the Delaware Estuary during the River Master 2010 report year. Selected data are presented, and water-quality conditions are summarized.

Water-Quality Monitoring Programs

U.S. Geological Survey Continuous Water-Quality Monitoring Program

As part of a long-term program, in cooperation with the DRBC, the USGS operates continuous water-quality monitors at four locations in the Delaware Estuary between Trenton, New Jersey, and Reedy Island Jetty, Delaware (fig. 6).

Continuous water temperature, specific conductance, dissolved-oxygen, and pH data were collected at four sites—Delaware River at Trenton, New Jersey (01463500); Delaware River at Benjamin Franklin Bridge at Philadelphia, Pennsylvania (01467200); Delaware River at Chester, Pennsylvania (01477050); and Delaware River at Reedy Island Jetty, Delaware (01482800). Continuous turbidity data also were collected at Trenton, Benjamin Franklin Bridge, and Reedy Island Jetty. The DRBC and others use these data to assess water-quality conditions and track the movement of the "salt front" in the Delaware Estuary. Continuous monitor data are processed and stored in the USGS National Water Information System (NWIS) database (U.S. Geological Survey, 2018b) and are available at https://waterdata.usgs.gov/nwis. Selected monitor data from the 2010 report year are included in this report.

Delaware Estuary Boat Run Monitoring Program

Each year, the DBRC contracts with the Delaware Department of Natural Resources and Environmental Control to collect water samples at 22 locations on the Delaware Estuary from Biles Channel to South Brown Shoal (sites A through W, fig. 6) (Delaware River Basin Commission, 2016). Samples are collected once a month from April to October. The goals of this program are to provide accurate, precise, and defensible estimates of the surface water quality of the Delaware Estuary and to allow assessment of compliance with water-quality criteria. Sample analysis includes routine and bacterial parameters, nutrients, heavy metals, chlorophyll *a*, dissolved silica, and volatile organics. Water-quality data for these DBRC sampling sites are not presented in this report but are accessible from the DRBC Boat Run Water Quality Data Explorer (https://www.nj.gov/drbc/quality/datum/boat-run_explorer-app.html).

Water Quality During the 2010 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 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 could result in excessive levels of algae.

Streamflow from the Delaware River Basin upstream from 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 March 2010 (32,900 ft^3/s) and lowest during September 2010 (2,891 ft^3/s; table 15). Monthly mean streamflows were less than long-term mean monthly flows in February 2010, from April to September 2010, and in November 2010. The greatest percentage of flow deficiency was in September 2010, when monthly mean streamflow was 53 percent of the long-term mean monthly flow. Long-term monthly mean streamflow was computed for the period from February 1913 to September 2010. The highest daily mean streamflow during the report year was 90,700 ft^3/s on October 2, 2010. The lowest daily mean streamflow was 2,530 ft^3/s on September 22, 2010.

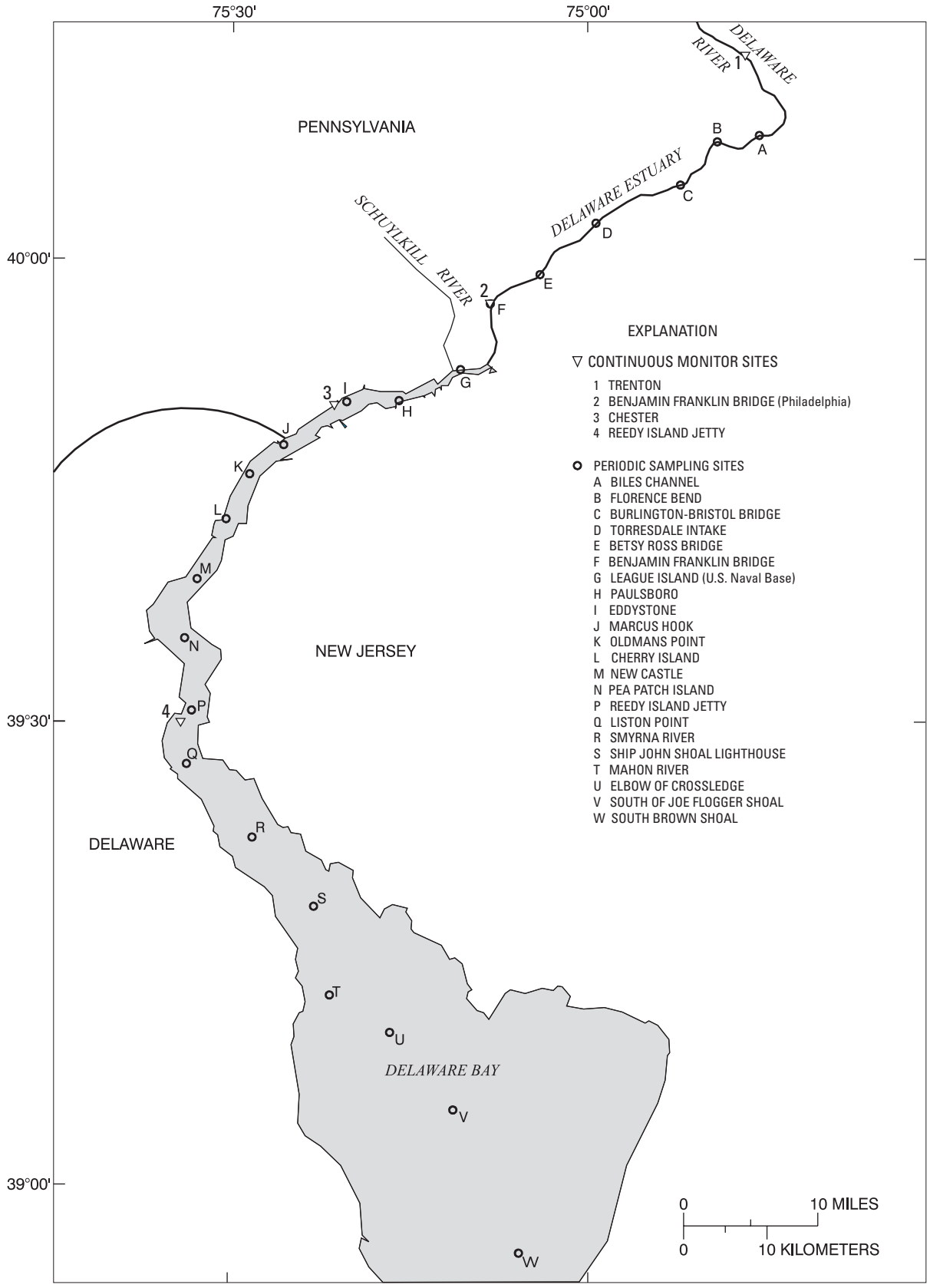

Figure 6. Map showing location of water-quality monitoring sites on the Delaware Estuary.

Water Temperature

Water temperature has an important influence on water quality, as it affects various physical, chemical, and biological properties of water (U.S. Geological Survey, 2018d). 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 substantial effects.

Water temperature data for the monitor site at the Benjamin Franklin Bridge, Philadelphia, Pennsylvania, were collected almost continuously from April to November 2010. From April through September 2010, the monthly mean temperature was greater than the long-term mean monthly temperature. Monthly mean temperatures were less than the respective long-term means in October and November 2010. Long-term mean water temperatures were computed using data for the period from 1964 to 2010 (fig. 7). The maximum daily mean water temperature of 28.8 degrees Celsius was recorded on July 25, 2010.

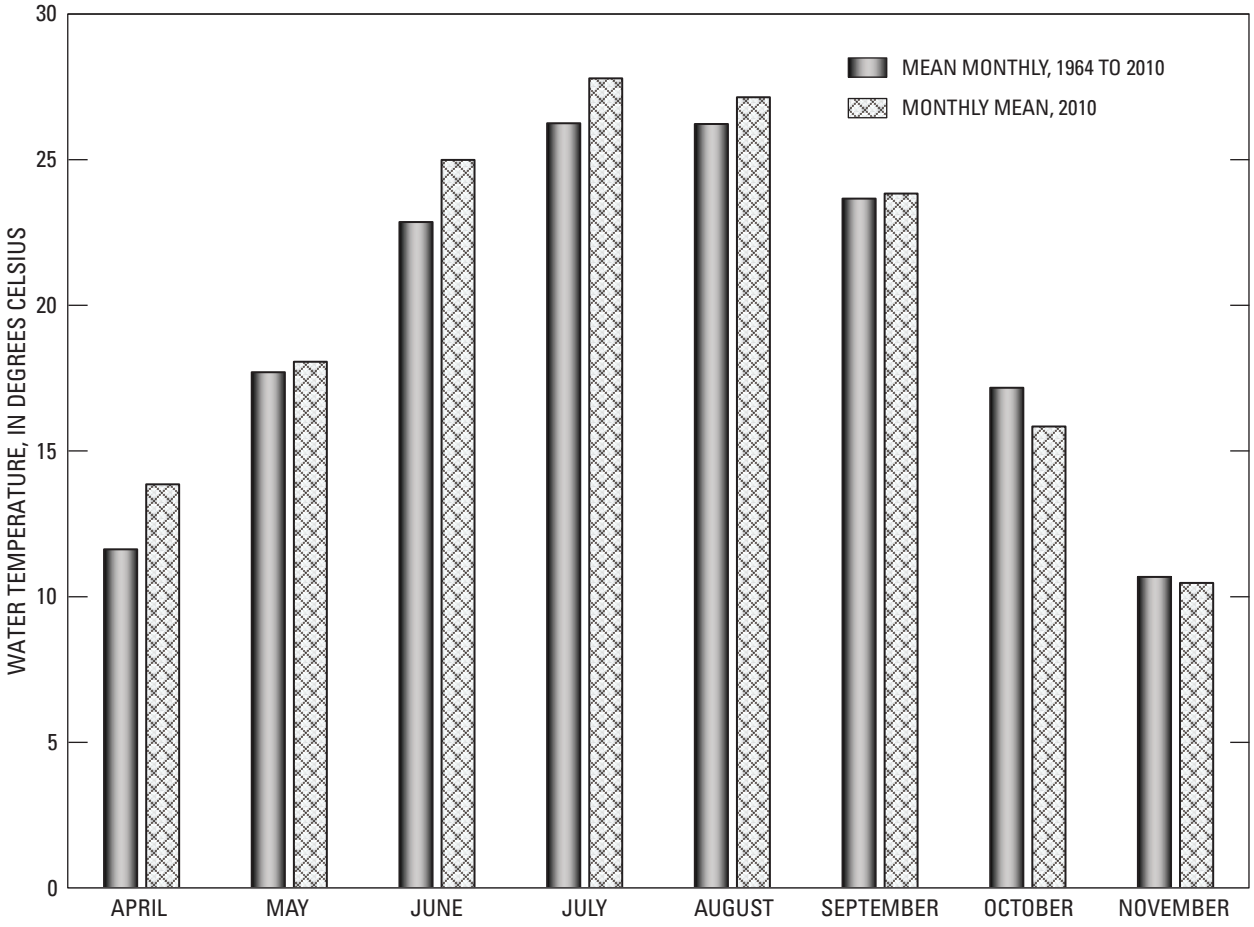

Figure 7. Graph showing water temperature in the Delaware Estuary at Benjamin Franklin Bridge at Philadelphia, Pennsylvania, April to November 2010.

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 (U.S. Environmental Protection Agency, 2018). 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 manmade constituents can cause the specific conductance of estuary water to increase substantially. Dilution associated 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 (Kauffman and others, 2008). 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 proximity to the Atlantic Ocean.

Chloride concentration was not measured by the USGS at the monitor site at Reedy Island Jetty, Delaware. At Reedy Island Jetty, the greatest daily maximum specific conductance was 21,100 microsiemens per centimeter (µS/cm) on August 19 and 20, 2010 (table 16). Daily maximum specific conductance during the report year exceeded 3,780 µS/cm on approximately 95 percent of the days. The lowest daily minimum specific conductance was 233 µS/cm on February 8, 2010. Daily minimum specific conductance exceeded 3,780 µS/cm on approximately 70 percent of the days.

Chloride concentrations at Chester, Pennsylvania (table 17), were measured directly by Kimberly Clark Chester Operations (Gail Blum, Delaware River Basin Commission, written commun., 2018) and are not derived from specific conductance data. At Chester, the greatest daily maximum chloride concentration was 633 mg/L on September 27, 2010 (table 17). During the report year, daily maximum concentrations exceeded 50 mg/L on 51 percent of the days. The lowest daily minimum chloride concentration was 20 mg/L on October 13, 2010. Daily minimum concentrations exceeded 50 mg/L on about 37 percent of the days. Chloride concentrations were persistently high from mid-February to mid-March 2010 and from the end of June through the end of September 2010, when daily minimum concentrations exceeded 50 mg/L on most days.

Dissolved Oxygen

Dissolved oxygen in water is necessary for the respiratory processes of aquatic organisms and for chemical reactions in aquatic environments (U.S. Geological Survey, 2018c). Fish and many other clean-water species consistently require relatively high dissolved-oxygen concentrations. 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 1961 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. For these stations, the mean and minimum daily mean dissolved-oxygen concentrations for the 3-month period of July to September during the 1965–2010 report years are shown in figure 8. Although concentrations have increased considerably over this 46-year period, mean concentrations can vary substantially from year to year. Due to changes in technology and other factors, the process used to determine mean dissolved-oxygen concentrations and the values of those data have changed slightly through time. The procedures used to create figure 8 of this report were started for this report. The procedures used were to retrieve the available mean and minimum daily dissolved-oxygen-concentration data from the USGS NWIS database for the months of July, August, and September and compute the average mean and average minimum dissolved-oxygen concentration of all those daily values pooled over the 3-month period of each report 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 from the Benjamin Franklin Bridge, concentrations commonly reach minimum levels. During the report year, the lowest recorded daily mean concentration was 4.4 mg/L on August 26, 2010 (table 18). Daily mean concentrations of dissolved oxygen were consistently 6.0 mg/L or greater on all days from April 1 through June 8, 2010, and October 2 through November 30, 2010. At Chester, the lowest recorded daily mean dissolved-oxygen concentration was 4.4 mg/L on July 16, 2010 (table 19).

Histograms of half-hourly dissolved-oxygen concentrations during the critical summer period at the Benjamin Franklin Bridge (August 7, 2010 to September 30, 2010) and Chester (July 14, 2010 to September 30, 2010) monitor sites are presented in figure 9. Half-hourly concentrations at the Benjamin Franklin Bridge and Chester were above 4 mg/L for the entire 2010 critical summer period.

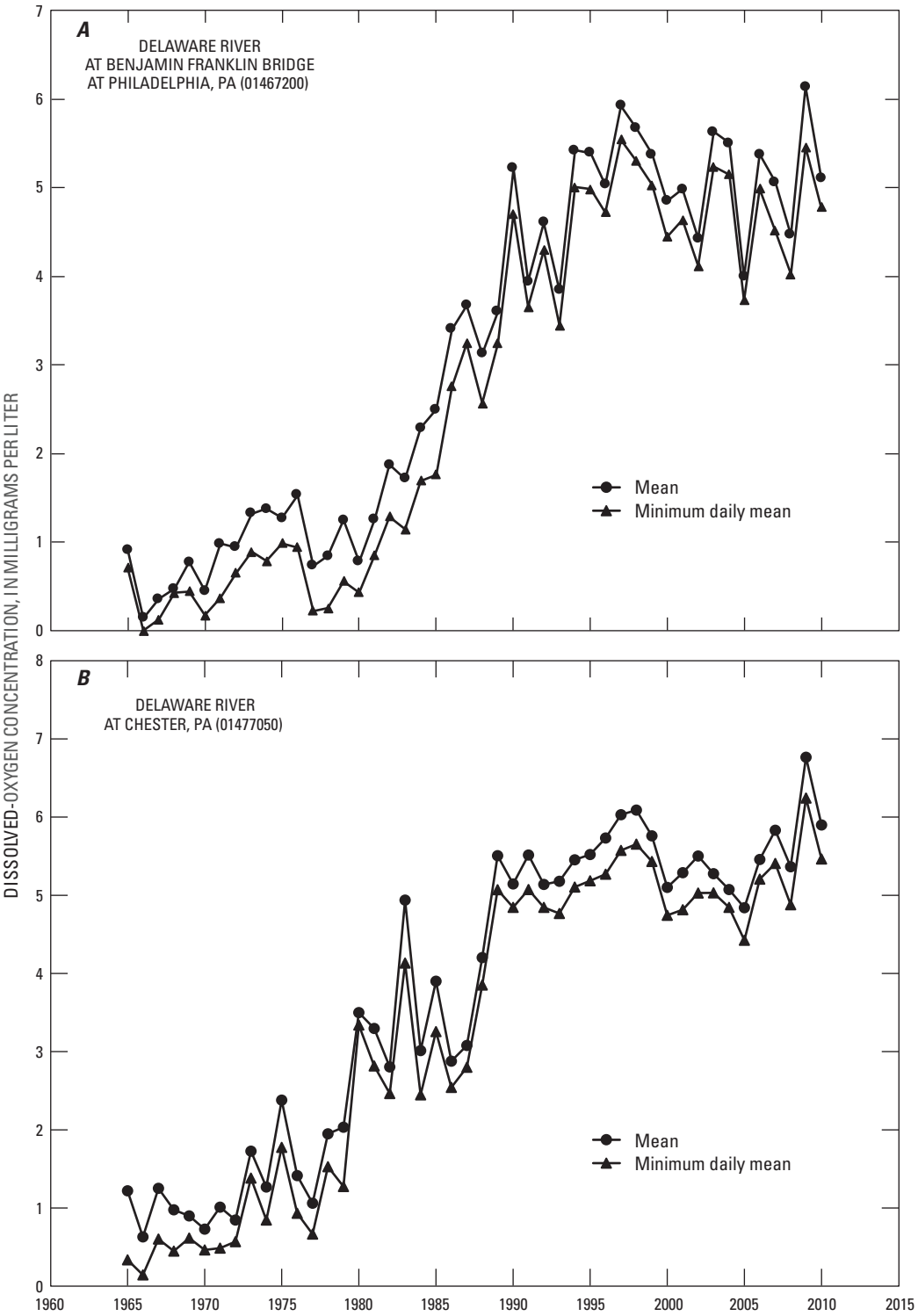

Figure 8. Graphs showing mean and minimum daily mean dissolved-oxygen concentrations from July to September at two sites on the Delaware Estuary, 1965–2010: (A) Delaware River at Benjamin Franklin Bridge at Philadelphia, Pennsylvania (PA), and (B) Delaware River at Chester, Pennsylvania.

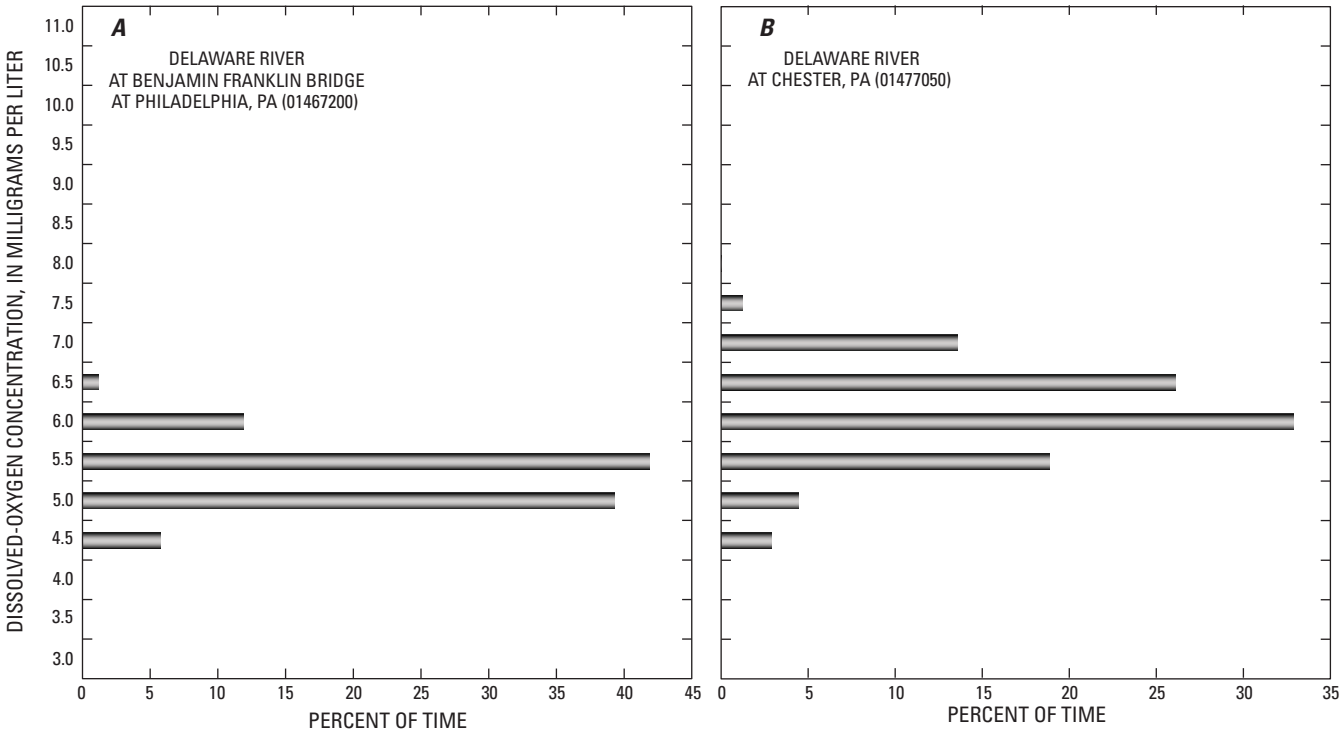

Figure 9. Graphs showing distribution of half-hourly dissolved-oxygen concentrations at two sites on the Delaware Estuary, July to September 2010: (*A*) Delaware River at Benjamin Franklin Bridge at Philadelphia, Pennsylvania (PA), and (*B*) Delaware River at Chester, Pennsylvania.

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 effluent discharges. In addition, photosynthetic activity and dissolved gases, including carbon dioxide, hydrogen sulfide, and ammonia, can have a considerable effect on pH. The pH of water determines the solubility (amount that can be dissolved in the water) and biological availability (amount that can be utilized by aquatic life) of chemical constituents such as nutrients (phosphorus, nitrogen, and carbon) and heavy metals (for example, lead, copper, and cadmium) (U.S. Geological Survey, 2018a). 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 are as follows: Benjamin Franklin Bridge, 6.9 to 7.5; Chester, 7.1 to 7.8; and Reedy Island Jetty, 7.3 to 8.0. Generally, the pH of water in the Delaware Estuary is lowest near Trenton, New Jersey, and increases (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 was not a limiting factor for aquatic health or other beneficial uses of the water during the report year.

Table 15. Daily mean discharge of the Delaware River at Trenton, New Jersey (station number 01463500), for report year ending November 30, 2010.

[U.S. Geological Survey published record. All values except totals are in cubic feet per second, ft^3/s; totals are in cubic feet per second day (ft^3/s)-d; —, not applicable]

Day	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.
1	8,030	17,900	17,500	12,900	63,400	14,300	5,380	3,740	2,840	3,130	40,400	7,700
2	8,460	16,700	16,800	13,700	51,800	13,400	5,320	3,540	3,250	3,010	90,700	7,070
3	16,500	15,200	16,300	13,700	42,000	16,100	5,190	3,350	3,290	2,920	51,500	6,570
4	29,000	[1]13,700	15,100	14,600	36,000	18,200	5,040	3,310	3,300	2,800	31,100	6,720
5	26,400	[1]12,400	13,500	14,800	31,700	15,100	4,950	3,230	3,110	2,880	26,400	10,400
6	21,700	[1]12,100	12,600	14,800	27,100	13,200	4,960	3,410	3,050	3,110	29,600	12,500
7	18,100	12,400	11,600	14,800	23,600	11,800	4,450	3,270	3,010	2,970	31,100	12,700
8	16,200	12,600	10,500	14,700	21,600	10,600	4,270	3,200	2,970	2,920	24,800	10,800
9	26,500	[1]11,200	10,100	15,600	20,300	9,610	4,410	3,210	3,250	2,760	19,800	9,660
10	27,600	[1]9,480	10,900	17,000	19,100	8,680	5,690	3,560	3,110	2,880	16,600	9,260
11	22,100	[1]8,720	11,300	18,100	17,800	8,930	5,780	7,110	2,930	2,810	14,400	8,720
12	18,700	9,440	10,900	19,500	16,100	9,290	5,860	4,560	2,910	2,810	13,200	8,160
13	17,200	10,100	10,300	37,300	14,700	10,300	5,590	4,700	3,020	3,030	11,500	7,620
14	21,600	10,800	9,680	67,400	13,400	10,900	7,700	4,580	3,120	3,220	11,400	7,090
15	21,500	10,700	8,890	71,500	12,600	11,000	10,300	7,130	3,090	3,040	11,100	6,620
16	22,500	10,700	8,810	60,200	11,900	9,540	9,280	5,000	3,340	3,020	11,000	6,440
17	21,500	10,300	9,120	49,100	12,500	8,550	7,480	3,960	3,400	3,150	10,800	7,040
18	20,000	12,100	8,790	40,900	12,800	8,330	6,720	3,600	3,340	3,060	12,300	11,900
19	17,400	12,700	8,470	34,900	12,300	9,180	5,980	3,480	3,480	2,790	11,100	15,500
20	16,400	13,900	8,370	30,400	11,400	9,460	5,780	3,290	3,310	2,760	8,930	13,700
21	15,800	13,200	8,230	27,100	11,400	9,410	5,180	3,500	2,960	2,570	8,020	11,700
22	14,900	11,800	7,590	24,600	10,700	8,550	[1]4,750	3,640	2,800	2,530	7,410	10,500
23	14,200	10,600	7,970	34,100	10,100	7,800	[1]4,750	3,500	3,270	2,860	6,600	9,750
24	13,800	9,860	13,500	53,200	9,790	6,960	4,720	3,280	4,020	2,890	6,320	9,330
25	13,200	17,800	14,100	50,600	9,450	6,610	4,600	3,820	7,980	2,790	5,830	9,880
26	18,500	45,700	12,900	42,300	13,900	6,320	4,540	4,940	8,320	2,590	5,520	10,500
27	29,100	59,200	12,000	36,300	18,300	5,950	4,570	4,680	6,560	2,540	[1]6,600	10,400
28	29,600	40,100	12,300	32,100	20,700	6,710	4,450	3,820	5,820	2,670	[1]8,850	11,500
29	28,600	32,600	—	36,200	19,900	6,470	4,080	3,440	4,570	2,890	10,600	11,100
30	23,600	25,900	—	48,100	16,700	5,990	3,780	3,210	4,010	3,340	10,300	10,400
31	19,400	19,900	—	59,400	—	5,880	—	3,060	3,570	—	8,570	—
Total[2]	**618,090**	**529,800**	**318,120**	**1,019,900**	**613,040**	**303,120**	**165,550**	**122,120**	**117,000**	**86,740**	**562,350**	**291,230**
Mean[3]	19,938.0	17,090.0	11,361.0	32,900.0	20,435.0	9,778.0	5,518.0	3,939.0	3,774.0	2,891.0	18,140.0	9,708.0

[1]Estimated.

[2]Year total is, 4,747,060 (ft^3/s)-d.

[3]Year mean is, 12,956.0 ft^3/s.

Table 16. Daily maximum and minimum specific conductance, Delaware River at Reedy Island Jetty, Delaware (station number 01482800), for report year ending November 30, 2010.

[Concentrations are in microsiemens per centimeter; max, maximum value; min, minimum value; —, not applicable]

Day	Dec. max/min	Jan. max/min	Feb. max/min	Mar. max/min	Apr. max/min	May max/min	June max/min	July max/min	Aug. max/min	Sept. max/min	Oct. max/min	Nov. max/min
1	17,100/1,330	9,070/1,050	4,840/542	1,750/1,620	4,110/5,100	12,300/7,900	15,800/7,290	16,100/10,300	19,700/2,680	11,500/5,490	13,800/7,070	5,730/7,620
2	16,700/1,360	6,050/922	3,680/516	1,970/1,580	5,200/5,150	11,000/8,730	16,300/7,780	15,200/10,200	19,400/2,570	11,800/5,090	14,200/6,600	4,970/7,990
3	15,300/1,800	4,530/5,140	4,900/485	1,540/2,110	5,540/5,060	12,600/9,430	16,800/8,880	16,000/11,200	19,100/2,140	12,200/4,940	14,500/5,090	3,900/8,990
4	12,800/3,070	11,400/5,750	4,120/501	1,360/1,160	6,170/5,820	13,100/10,500	18,600/9,140	16,500/9,560	20,000/2,130	10,300/5,250	12,200/7,190	3,790/8,610
5	12,700/3,510	12,700/5,520	13,100/307	2,730/2,590	7,690/7,310	14,200/11,200	20,400/9,130	17,900/9,800	20,000/2,320	9,210/6,610	12,400/3,330	3,540/10,600
6	12,500/3,880	13,000/6,880	13,300/278	4,210/3,270	6,260/6,920	15,600/10,700	20,500/9,280	17,400/10,300	18,400/2,330	8,010/7,170	12,000/2,110	3,460/11,600
7	11,700/4,870	13,100/6,240	14,500/253	4,690/5,150	10,000/7,650	16,800/11,100	20,500/9,980	17,400/10,700	16,700/2,370	9,850/8,810	14,800/1,590	2,100/10,900
8	9,830/5,750	14,700/6,440	17,100/233	4,420/4,430	14,000/8,070	16,500/11,100	19,000/10,800	18,000/11,300	17,900/2,360	8,380/8,850	16,300/2,210	1,270/10,500
9	12,800/6,120	13,700/4,320	16,800/2,090	3,310/4,470	13,800/7,780	16,500/9,520	19,900/10,300	17,500/11,500	18,300/2,790	9,460/8,400	18,700/1,930	1,030/11,100
10	6,050/7,110	15,300/4,350	15,600/1,750	1,180/3,950	12,200/7,740	16,200/9,130	20,000/10,900	18,200/12,500	17,800/2,940	10,200/9,130	17,800/2,130	1,030/11,100
11	3,180/6,170	16,200/4,590	11,300/1,750	483/4,040	11,900/7,790	14,900/8,630	18,000/10,700	18,200/12,400	19,600/2,520	10,000/8,990	17,300/1,280	838/9,970
12	2,730/6,960	16,300/3,980	15,400/1,820	364/4,120	11,600/6,830	16,400/8,520	16,700/9,030	16,800/12,500	18,800/4,560	8,580/9,700	18,200/1,250	881/9,990
13	6,460/7,050	15,500/4,420	14,000/1,770	291/4,300	11,000/6,940	16,100/7,980	16,400/9,120	17,300/11,100	19,100/5,510	11,700/7,360	17,800/2,520	699/11,700
14	4,930/6,420	16,900/4,680	11,900/2,030	6,660/4,330	10,900/6,620	15,900/8,040	13,800/9,850	16,400/11,100	18,800/6,030	14,100/7,000	17,600/4,470	587/10,800
15	6,590/7,250	17,100/4,960	13,000/2,200	8,340/4,500	10,600/6,860	14,600/8,110	14,100/9,630	16,200/12,300	17,000/5,960	14,200/6,990	18,100/5,850	543/9,670
16	4,160/7,330	14,900/4,650	13,400/2,360	5,860/4,170	11,000/6,550	13,800/8,170	15,200/10,100	15,700/12,700	20,900/6,510	14,700/6,620	12,800/6,210	1,320/8,870
17	4,040/6,920	14,800/4,070	14,600/2,380	6,360/4,440	11,200/6,770	12,700/8,180	15,200/11,800	17,700/13,700	20,200/5,410	15,300/6,760	14,600/5,880	2,610/9,720
18	8,360/6,200	16,200/3,840	13,400/2,520	6,560/4,370	9,310/6,620	12,600/7,990	15,700/11,400	16,200/13,500	20,600/4,760	15,600/6,900	15,900/6,830	2,960/10,100
19	9,840/6,200	15,000/3,870	13,100/2,650	6,740/3,890	10,600/6,460	13,500/8,270	15,400/12,800	19,500/12,200	21,100/4,260	12,900/6,540	13,800/7,980	2,710/9,440
20	11,100/7,180	13,500/3,740	13,000/2,630	7,350/3,620	10,600/6,120	14,900/8,480	16,900/12,300	19,500/12,700	21,100/5,160	12,200/5,990	15,100/9,910	2,420/9,780
21	9,950/6,570	12,500/3,830	12,000/2,210	6,680/4,080	9,110/7,470	13,300/8,380	16,900/12,000	18,000/12,700	17,600/5,600	12,700/6,840	14,000/10,900	3,300/6,430
22	9,260/6,200	13,900/3,940	12,500/1,900	7,950/4,460	11,300/7,010	12,800/8,380	16,700/11,700	19,800/12,300	19,900/4,620	14,500/5,420	12,300/7,840	5,490/3,910
23	11,500/5,790	14,800/5,390	12,400/1,960	6,990/5,110	11,300/6,890	12,800/8,400	15,700/11,400	20,800/14,000	18,400/4,440	12,700/4,970	14,400/4,650	7,760/2,870
24	14,000/3,690	14,700/2,430	14,500/1,880	8,840/4,860	12,300/6,600	13,000/7,970	16,000/10,600	18,300/13,400	18,900/4,390	11,700/5,130	14,100/2,960	3,520/2,020
25	14,400/2,040	15,300/507	14,500/1,800	8,840/5,020	13,900/7,130	14,000/7,700	16,500/11,100	17,700/12,900	20,700/4,420	11,800/5,620	12,100/2,910	2,440/1,540
26	15,600/1,750	11,300/600	15,200/1,800	6,020/4,880	12,200/7,500	15,800/8,480	15,500/10,800	17,300/12,800	19,100/4,130	11,400/11,500	12,300/3,440	1,560/2,210
27	12,400/1,040	8,550/535	1,130/1,660	6,160/5,120	11,000/7,740	14,100/9,320	15,700/11,200	17,700/9,710	18,300/3,520	13,600/11,300	13,600/3,900	1,650/2,210
28	8,820/1,040	7,090/663	2,350/1,520	6,340/4,580	11,500/8,250	14,700/9,380	15,900/10,500	18,300/4,940	19,900/4,700	9,490/11,100	13,100/2,790	1,840/1,650
29	3,820/1,140	4,440/705	—	7,360/5,080	11,400/8,230	14,700/9,200	16,500/10,600	18,500/3,170	16,000/5,480	12,100/8,130	8,250/1,990	1,840/2,030
30	6,610/999	3,450/617	—	6,560/4,660	10,400/7,510	14,700/8,170	15,600/12,200	19,400/3,330	10,800/6,410	12,800/7,680	8,520/4,330	1,550/1,790
31	8,580/998	6,210/663	—	5,940/5,060	—	15,400/7,410	—	19,100/2,630	9,610/5,760	—	7,260/6,780	—
Mean	9,800/4,443	12,329/3,526	11,629/1,564	4,963/4,033	10,270/6,950	14,371/8,854	16,873/10,410	17,697/10,756	18,507/4,154	11,766/7,343	14,124/4,643	2,578/7,524
Max	17,100/7,330	17,100/6,880	17,100/2,650	8,840/5,150	14,000/8,250	16,800/11,200	20,500/12,800	20,800/14,000	21,100/6,510	15,600/11,500	18,700/10,900	7,760/11,700
Min	2,730/998	3,450/507	1,130/233	291/1,160	4,110/5,060	11,000/7,410	13,800/7,290	15,200/2,630	9,610/2,130	8,010/4,940	7,260/1,250	543/1,540

Table 17. Daily maximum and minimum chloride concentrations, Delaware River at Chester, Pennsylvania (station number 01477050), for report year ending November 30, 2010.

[Record furnished by Kimberly Clark Chester Operations. Concentrations are in milligrams per liter. max, maximum value; min, minimum value; —, not applicable]

Day	Dec. max/min	Jan. max/min	Feb. max/min	Mar. max/min	Apr. max/min	May max/min	June max/min	July max/min	Aug. max/min	Sept. max/min	Oct. max/min	Nov. max/min
1	38/32	74/58	38/30	94/85	32/32	39/32	57/48	76/53	100/88	285/138	92/45	42/35
2	45/32	74/57	45/32	94/68	32/32	39/32	57/57	94/85	94/77	229/180	45/38	49/35
3	38/32	65/57	46/32	94/60	32/32	39/32	57/49	85/85	115/88	327/180	45/32	49/35
4	32/32	63/57	46/46	94/94	32/32	39/32	57/42	98/85	138/77	180/131	32/26	56/49
5	32/32	60/56	46/46	94/85	38/32	39/32	49/39	88/67	100/77	285/151	32/26	49/42
6	32/32	66/57	53/46	94/94	32/28	39/32	48/39	88/57	166/88	350/166	32/26	49/35
7	38/32	53/38	46/40	94/85	38/32	39/32	39/39	88/67	88/77	247/166	42/35	49/49
8	38/32	45/38	53/40	85/76	32/32	46/46	39/39	112/67	125/88	350/212	35/28	49/42
9	32/32	53/38	60/53	92/61	32/32	39/32	48/39	77/67	125/100	457/180	35/28	49/42
10	38/32	61/45	60/46	81/53	32/32	32/32	77/39	77/67	181/151	400/212	35/28	49/42
11	45/32	53/45	76/53	92/61	32/32	39/32	48/39	88/77	247/212	479/250	36/28	49/35
12	38/26	53/45	85/60	61/53	32/32	39/32	48/39	88/57	247/166	513/292	35/20	42/35
13	46/32	45/45	85/53	53/45	32/32	39/32	48/39	88/77	305/180	447/250	38/28	49/49
14	38/32	53/45	76/53	45/38	32/32	39/32	48/39	67/57	265/166	447/250	42/35	49/42
15	38/32	45/45	85/60	38/38	39/32	39/32	48/39	67/57	247/166	447/292	35/28	49/42
16	38/32	45/45	85/68	32/32	39/25	39/32	39/39	77/67	180/151	389/314	55/33	49/49
17	45/38	53/45	85/76	38/32	39/32	39/39	48/39	77/57	180/151	363/250	42/35	49/49
18	45/32	53/53	85/53	45/32	39/32	39/32	48/39	67/57	166/151	479/250	35/21	49/42
19	45/38	53/45	76/60	38/32	32/32	39/39	53/46	71/48	166/151	417/212	42/28	49/42
20	45/38	53/45	104/70	38/32	32/32	39/32	56/46	67/39	285/151	513/231	42/28	49/38
21	45/32	53/45	85/68	38/32	39/32	39/32	53/46	67/39	247/166	417/250	49/35	49/49
22	53/45	53/45	94/85	32/32	39/32	49/39	53/46	67/39	180/166	449/250	42/35	56/49
23	65/57	53/38	94/76	38/32	39/32	57/32	53/46	57/39	229/166	417/363	42/35	49/42
24	65/57	53/45	94/68	32/32	39/32	54/42	76/53	48/39	212/180	363/250	42/42	49/49
25	65/65	61/45	94/94	32/32	39/32	42/34	76/60	67/39	212/151	479/250	49/42	49/42
26	65/47	53/45	94/76	38/32	39/32	49/42	68/53	77/48	229/138	633/363	42/35	49/42
27	93/65	53/45	94/94	38/32	39/32	49/42	76/53	67/48	229/229	589/513	42/35	49/42
28	83/65	45/38	—	32/32	39/32	57/42	85/46	77/57	229/229	589/363	42/35	49/42
29	83/65	53/32	—	38/32	39/32	49/42	85/60	88/57	229/166	549/389	42/35	49/49
30	70/60	45/38	—	38/32	—	57/42	—	100/88	265/151	—	42/35	—
31	49/40	55/46	72/58	60/50	36/32	43/35	56/45	79/60	190/141	411/248	52/34	49/43
Mean	93/65	74/58	104/94	94/94	39/32	57/46	85/60	112/88	305/229	633/513	338/92	56/49
Max	32/26	45/32	38/30	32/32	32/25	32/32	39/39	48/39	88/67	180/131	32/20	42/35
Min	2,730/998	3,450/507	1,130/233	291/1,160	4,110/5,060	11,000/7,410	13,800/7,290	15,200/2,630	9,610/2,130	8,010/4,940	7,260/1,250	543/1,540

Table 18. Daily mean dissolved-oxygen concentrations, Delaware River at Benjamin Franklin Bridge at Philadelphia, Pennsylvania (station number 01467200), April 1 to November 30, 2010.

[U.S. Geological Survey published record. Concentrations are in milligrams per liter. *, missing data; —, not applicable; Max, maximum value; Min, minimum value]

Day	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.
1	11.7	10.0	7.4	*	*	5.2	5.8	8.6
2	11.7	10.1	7.0	*	*	5.3	6.4	8.6
3	11.5	*	6.8	*	*	5.2	6.9	8.5
4	11.3	*	6.8	*	*	5.1	7.0	8.3
5	11.0	*	6.6	*	*	5.4	7.3	8.1
6	10.7	*	6.6	*	*	5.5	7.5	8.3
7	10.3	*	6.5	*	4.9	5.7	7.9	8.6
8	10.0	*	6.5	*	5.0	5.8	8.2	8.9
9	9.5	*	*	*	5.1	5.9	8.3	9.1
10	9.3	8.6	*	*	5.0	5.8	8.3	9.2
11	9.1	8.7	*	*	4.8	5.8	8.2	9.2
12	8.9	8.3	*	*	4.7	5.5	8.0	9.2
13	8.7	8.2	*	*	4.8	5.2	7.9	9.4
14	8.7	8.4	*	*	4.8	5.1	7.8	9.4
15	8.6	8.5	*	*	4.8	5.0	7.7	9.4
16	8.7	8.7	*	*	4.7	5.2	8.0	9.5
17	8.6	8.8	*	*	4.7	5.1	8.0	9.5
18	8.7	8.3	*	*	4.8	5.1	8.0	9.9
19	8.9	8.1	*	*	4.7	5.0	8.0	10.1
20	9.0	8.5	*	*	4.8	5.1	8.0	10.2
21	9.2	8.8	*	*	5.0	5.2	7.9	10.3
22	9.0	8.9	*	*	5.0	5.4	8.1	10.2
23	9.4	8.7	*	*	4.7	5.4	8.2	10.1
24	9.7	8.6	*	*	4.7	5.3	8.3	10.1
25	9.3	8.4	*	*	4.5	5.3	8.2	10.1
26	9.1	8.1	*	*	4.4	5.4	8.2	9.9
27	9.0	8.2	*	*	4.6	5.3	8.1	10.1
28	9.3	8.0	*	*	4.8	5.3	8.1	10.3
29	9.5	7.9	*	*	5.0	5.3	8.3	10.4
30	9.7	7.8	*	*	5.1	5.3	8.4	10.5
31	—	7.8	—	*	5.2	—	8.6	—
Mean	9.6	*	*	*	*	5.3	7.9	9.5
Max	11.7	10.1	7.4	*	5.2	5.9	8.6	10.5
Min	8.6	7.8	6.5	*	4.4	5.0	5.8	8.1

Table 19. Daily mean dissolved-oxygen concentrations, Delaware River at Chester, Pennsylvania (station number 01488050), April 1 to November 30, 2010.

[U.S. Geological Survey published record. Concentrations are in milligrams per liter. *, missing data; —, not applicable; Max, maximum value; Min, minimum value]

Day	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.
1	11.2	10.3	6.7	*	6.1	5.7	7.0	7.7
2	11.1	10.3	6.7	*	6.1	5.7	5.7	7.8
3	10.9	10.0	6.7	*	6.2	5.6	6.3	7.9
4	10.9	9.7	6.5	*	6.3	5.7	6.8	8.0
5	10.8	9.9	6.1	*	6.2	5.9	7.0	8.0
6	10.6	10.1	6.0	*	6.1	6.0	6.9	7.7
7	10.4	10.2	6.0	*	6.0	6.2	*	7.8
8	10.1	10.1	5.9	*	6.1	6.3	*	8.2
9	9.9	9.7	5.9	*	6.0	6.4	*	8.6
10	9.7	9.5	5.6	*	6.0	6.4	*	8.8
11	9.5	9.3	5.7	*	5.7	6.5	*	8.9
12	9.3	8.8	5.9	*	5.5	6.5	*	9.0
13	8.9	8.7	6.0	*	5.5	6.3	*	8.8
14	8.8	8.5	5.9	4.9	5.6	6.3	6.7	8.6
15	8.8	8.3	5.8	4.5	5.5	6.4	6.9	8.5
16	8.7	8.1	5.7	4.4	5.6	6.5	7.3	8.5
17	8.7	7.8	5.4	4.6	5.5	6.5	7.2	8.9
18	8.8	7.5	5.4	4.9	5.3	6.6	7.3	9.0
19	9.1	7.3	5.5	5.3	5.2	6.6	7.1	8.9
20	9.4	7.1	5.5	5.5	5.2	6.4	6.9	8.9
21	9.7	7.0	5.5	5.6	5.3	6.7	7.0	9.0
22	10.0	6.8	5.5	5.9	5.4	6.9	7.2	8.9
23	10.5	6.7	5.4	5.9	5.5	6.6	7.3	8.8
24	11.0	6.8	5.3	6.0	5.6	6.5	7.3	8.9
25	10.8	6.8	*	5.7	5.7	6.5	7.3	8.9
26	10.1	6.7	*	5.7	5.6	6.4	7.3	9.0
27	9.7	6.8	*	5.9	5.5	6.6	7.2	9.4
28	9.7	6.8	*	6.0	5.5	6.9	7.0	9.7
29	10.0	6.6	*	5.8	5.6	6.7	7.1	9.7
30	10.1	6.5	*	5.8	5.6	6.9	7.5	9.7
31	—	6.4	—	5.9	5.6	—	7.7	—
Mean	9.9	8.2	*	*	5.7	6.4	*	8.7
Max	11.2	10.3	6.7	6.0	6.3	6.9	7.7	9.7
Min	8.7	6.4	5.3	4.4	5.2	5.6	5.7	7.7

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Appendixes 1–7

Appendix 1. Flexible Flow Management Program Effective October 1, 2007

Agreement of the Parties to the 1954 U.S. Supreme Court Decree

1. FLEXIBLE FLOW MANAGEMENT PROGRAM
   a. Program Established
   b. Criteria For Flexible Flow Management Program Modification
2. DIVERSIONS
   a. New York City
   b. New Jersey
3. FLOW OBJECTIVES
   a. Montague Flow Objective
   b. Trenton Flow Objective
4. RELEASES
   a. Conservation Releases from the City Delaware Basin Reservoirs
   b. Excess Release Quantity
   c. Interim Excess Release Quantity
   d. Interim Excess Release Quantity Extraordinary Needs Bank
5. DROUGHT MANAGEMENT
   a. Drought Watch
   b. Drought Warning
   c. Drought Emergency
   d. Entry and Exit Criteria
   e. Balancing Adjustment
6. TAILWATERS HABITAT PROTECTION and DISCHARGE MITIGATION PROGRAM
   a. Controlled Releases
   b. Sustainability
7. DISCHARGE MITIGATION
8. SALINITY REPULSION
9. DWARF WEDGE MUSSELS
10. LAKE WALLENPAUPACK
11. RECREATIONAL BOATING
12. ESTUARY AND BAY ECOLOGICAL HEALTH
13. WARM-WATER AND MIGRATORY FISH
14. MONITORING AND REPORTING
15. REASSESSMENT STUDY

16. PERIODIC EVALUTION AND REVISION
17. TEMPORARY SUSPENSION OR MODIFICATION
18. RESERVATIONS
19. EFFECTIVE DATE
20. RENEWAL AND REVISION
21. TERMINATION AND REVERSION
22. RESCISSION AND NULLIFICATION

An Agreement, consented to by the Parties (the State of Delaware (DE), the State of New Jersey (NJ), the State of New York (NY), the Commonwealth of Pennsylvania (PA), and the City of New York (NYC or City); hereafter Decree Parties) to the Amended Decree of the U.S. Supreme Court in New Jersey v. New York, 347 U.S. 995 (1954), (hereafter Decree) and proposing to modify and supercede certain provisions of Delaware River Basin Commission (DRBC) Resolutions D-77-20 CP (Revised) (also referred to as Revision 1) and subsequent revisions, to establish a Flexible Flow Management Program (FFMP) for managing diversions and releases under the Decree. The Parties hereby agree to the following and support adoption of appropriate Delaware River Basin Water Code revisions by the DRBC.

1. FLEXIBLE FLOW MANAGEMENT PROGRAM

a. Program Established

A Flexible Flow Management Program, as described in Sections 2 through 17, herein, is hereby established, whereby the Decree Parties shall manage diversions and releases under the Decree. The FFMP is designed to provide safe and reliable supplies of water essential to serve the needs of over 17 million people who depend on water from the 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 to help sustain cold water fisheries; 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 incorporates the elements provided in Sections 2 through 17, recognizing that various elements may require further study and investigation either prior to or during implementation and that some elements may therefore be implemented prior to others. It is also recognized that other elements may be added in the future, upon unanimous agreement of the Decree Parties, when or if identified. Addition of, or modifications to, elements of the FFMP may require adjustments or modifications to other prior established elements.

b. Criteria For Flexible Flow Management Program Modification

In reviewing proposed modifications to address the purposes of the FFMP, as provided in Sections 15, 16 and 17 herein, the Decree Parties and the DRBC will consider criteria that may include, without any particular priority, but are not limited to, the following:

i. Decree Party equity
ii. Net benefits and costs to environmental and economic resources
iii. Source and sustainability of water available to support modification and the environmental or economic resource(s)
iv. Habitat types—with naturally-occurring habitats receiving consideration over man-made habitats
v. Scientific basis for modification
vi. Impacts to drought management, water supply and flood mitigation, including but not limited to: 1) frequency, duration and seasonal timing of the various levels of drought; and 2) frequency, duration, levels of storage, diversions, releases and flows
vii. Extent to which the diversions and the Montague minimum basic rate of flow provided in the Decree are met
viii. Potential impacts to water quality, existing National and State Pollution Discharge

Elimination System permits and the assimilative capacity of the Delaware River
ix. Ease and practicability of operation
x. Consistency with adaptive management principles
xi. Applicability and implementation of water conservation practices
xii. Impacts to salinity

The Decree Parties agree to evaluate these parameters as well as potential additional parameters, and provide a report with recommendations.

2. DIVERSIONS

a. New York City

In accordance with Sections III. A. 3-4 of the Decree, and subject to the limitations provided herein, at no time during any twelve-month period, commencing June 1, shall the aggregate total quantity of water diverted by the City, divided by the number of days elapsed since the preceding May 31, exceed 800 million gallons per day (mgd). The City shall be subject to the releases and flow objectives described herein.

b. New Jersey

In accordance with Section V of the Decree, except with respect to limitations provided herein, the State of New Jersey may divert outside the Delaware River watershed, from the Delaware River or its tributaries in New Jersey, without compensating releases, the equivalent of 100 mgd under the supervision of the Delaware River Master (River Master) established by the Decree and shall be subject to the following conditions and obligations:

i. Until the State of New Jersey builds and utilizes one or more reservoirs to store waters of the Delaware River or its tributaries for the purpose of diverting the same to another watershed, or purchases or leases reallocated water or new storage from an existing or new storage facility, the State of New Jersey may divert not to exceed 100 mgd as a monthly average, with the diversion on any day not to exceed 120 million gallons.

ii. If and when the State of New Jersey has built and is utilizing one or more reservoirs to store waters of the Delaware River or its tributaries for the purpose of diversion to another watershed, it may withdraw water from the Delaware River or its tributaries into such impounding reservoirs without limitation except during the months of July, August, September and October of any year, when not more than 100 mgd as a monthly average and not more than 120 million gallons in any day shall be withdrawn. This restriction may be modified upon unanimous consent of the Decree Parties should the State of New Jersey purchase or lease reallocated water or new storage from an existing or new facility.

iii. Regardless of whether the State of New Jersey builds and utilizes storage reservoirs for diversion, its total diversion for use outside of the Delaware River watershed without compensating releases shall not exceed an average of 100 mgd during any calendar year.

3. FLOW OBJECTIVES

a. Montague Flow Objective

In accordance with Section III. B. 1. (b) of the Decree, except with respect to limitations provided herein, releases from the City Delaware Basin Reservoirs shall be in quantities designed to maintain a minimum basic rate of flow during Normal conditions at the gaging station of the United States Geological Survey (U.S.G.S.) at Montague of 1,750 cubic feet per second (cfs) during the period from September 16 through June 14 and 1,850 cfs during the period June 15 through September 15 in accordance with Section 4.c., as directed by the River Master in accordance with Section VII of the Decree.

The Decree Parties agree to evaluate the desirability of and alternatives to the existing Montague flow objective, including consideration of the availability of increased storage, and provide a report with recommendations within three years after the effective date of this Agreement. If a recommendation for change is made, the impact on the Trenton flow objective (see Paragraph b. below) shall be assessed.

b. Trenton Flow Objective

Section 2.5.3 of DRBC's Delaware River Basin Water Code (Water Code) establishes a set of flow objectives at Trenton, NJ to control salinity intrusion in the Delaware Estuary.

Upon the request of one or more of the Decree Parties or the DRBC, the Decree Parties and the DRBC agree to evaluate the desirability of and alternatives to the existing Trenton flow objective, including consideration of the availability of increased storage and the Montague flow objective, and provide a report with recommendations within three years after such request.

4. RELEASES

a. Conservation Releases from the City Delaware Basin Reservoirs

Conservation releases designed for protection of the ecology in the tailwaters below the City Delaware Basin Reservoirs, including water quality, recreation, and fishery habitat needs, shall be made in quantities described in the Tailwater Habitat Protection and Discharge Mitigation Program (THPDMP) in Section 6 below.

b. Excess Release Quantity

For an interim period ending May 31, 2011, the Decree Parties agree to use the Excess Release Quantity, as defined in the Decree, in support of an Interim Excess Release Quantity as defined in Paragraph c. below.

c. Interim Excess Release Quantity

For an interim period ending May 31, 2011, an Interim Excess Release Quantity (IERQ) shall be provided in conjunction with the NJ increased diversions and elimination of the Drought Emergency

salt-front vernier as provided herein, and an increased Montague objective of 1,850 cfs during basinwide Normal conditions. The IERQ is computed as 83 percent of the difference between the highest year's consumption of the NYC water supply system during the past five years of 1,257 mgd and NYC's current estimate of continuous safe yield of the NYC water supply system of 1,290 mgd obtainable without pumping. The continuous safe yield shall be subject to review under the Reassessment provided in Section 15. The IERQ shall be 15,468 cfs-days, except during any leap year the IERQ shall be 17,125 cfs-days.

NYC shall release the IERQ provided for above at rates designed to increase the flow at Montague from 1,750 cfs to 1,850 cfs for the period commencing on June 15 and continuing through September 15, and to maintain a flow at Trenton of 3,000 cfs during basinwide Normal conditions for the period commencing on June 15 and continuing through March 15 referred to as the "seasonal period." The IERQ required to be released in any seasonal period shall in no event exceed 70 billion gallons. In releasing the IERQ, NYC shall not be required to release at rates exceeding the capacity of its release works. NYC shall in each seasonal period continue its temporary releases until the aggregate quantity of the releases from the IERQ is equal to the total quantity of the IERQ as provided above.

The Decree Parties agree to investigate long-term measures including consideration of actions the lower basin states can take that will make adequate water available to support the NJ diversions and NYC detachment of the Montague objective from the salt front vernier during Drought Emergency.

d. Interim Excess Release Quantity Extraordinary Needs Bank

In addition to the hydrologic criteria described in Section 2.5.6 A. of the Delaware River Basin Water Code and subject to other provisional uses of the IERQ as provided herein including Section 6.b, the Decree Parties, the DRBC and the Delaware River Master may at any time review extraordinary water needs to support such research, aquatic life or other water-use activity as may be approved by the DRBC. Upon unanimous agreement, the Decree Parties may bank all or a portion of the IERQ remaining at such time, and such portion shall be placed in an "IERQ Extraordinary Needs Bank" and used to provide for such extraordinary water needs. Such quantity as may be so banked shall be deducted from the IERQ.

5. DROUGHT MANAGEMENT

Figure 1 defines five zones of combined reservoir usable storage relative to the existing three drought management curves (Drought Watch, Drought Warning, and Drought Emergency) and one additional curve that divides the existing Normal zone into two zones (L1 and L2).

The following drought stage definitions and procedures will be in effect:

a. Drought Watch (L3)

The seasonally segmented line (shown as dashes) splitting the current "Drought Warning" in Figure 1 of DRBC Resolution No. 83-13 and DRBC Docket No. D-77-20 CP (Revised) is raised by four (4) billion gallons during the entire year. In addition, the upper half of the Drought Warning, previously referred to as DW1, is renamed Drought Watch, with diversions and flow objectives as shown in Table 1.

b. Drought Warning (L4)

The lower half of the Drought Warning (DW2), based upon the rule curves included in DRBC Resolution No. 83-13 and as modified by Paragraph a. above, is designated Drought Warning, with diversions and flow objectives as shown in Table 1.

c. Drought Emergency (L5)

The operation level formerly named "Drought" in accordance with the rule curves included in DRBC Resolution No. 83-13 and Docket D77-20 (Revised) is hereby renamed "Drought Emergency." During Drought Emergency, diversions shall be limited as shown in Table 1. The Montague and Trenton flow objectives are as shown in Tables 1 and 2.

Table 1
Interstate Operation Formula
For Diversions, Releases And Flow Objectives

NYC Storage Condition	*NYC Diversion (mgd)*	*NJ Diversion (mgd)*	*Montague Flow Objective (cfs)*	*Trenton Flow Objective (cfs)*
Normal (June 15 – Sept 15)	800	100	1,850*	3,000
Normal (Sept 16 – June 14)	800	100	1,750	3,000
Drought Watch (L3)	680	100	1,650	2,700
Drought Warning (L4)	560	85	1,540	2,700
Drought Emergency (L5)	520	85	1,100-1,500**	2,500-2,900***
Severe Drought	(to be negotiated depending upon conditions)			

* To the extent supported by the IERQ pursuant to Section 4.c., otherwise 1,750 cfs

** Varies with time of year, in accordance with Table 2

*** Varies with time of year and location of salt front, in accordance with Table 2

Table 2
Interstate Operation Formula
For Adjusting Montague And Trenton Flow Objectives
During Drought Emergency (L5) Operations

	Flow Objective (cfs)						
	Trenton			*Montague*			
7-Day Average Location of "Salt Front" (river-mile***)*	*Dec 1 - Apr 30*	*May 1 - Aug 31*	*Sep 1 - Nov 30*	*June 1 - June 30*	*July 1 - Nov 31*	*Dec 1 - Dec 31*	*Jan 1 - May 31*
-	-	-	-	1,450	1,500	1,350	1,100
Upstream of R.M. 92.5	2,700	2,900	2,900				
R.M. 87.0 – R.M. 92.5	2,700	2,700	2,700				
R.M. 82.9 – R.M. 87.0	2,500	2,500	2,500				
Downstream of R.M. 82.9	2,500	2,500	2,500				

* Defined as the 250 mg/L isochlor in the Delaware Estuary

** Measured in statute miles along the center of the navigation channel, from the mouth of the Delaware Bay

d. Entry and Exit Criteria

Criteria for entry into and exit from the various stages of drought operations shall be in accordance with Section 2.5.3.E of the Delaware River Basin Water Code. L2 or higher level releases will be restored when combined storage in the three City Delaware Basin Reservoirs reaches 25 billion gallons above the drought watch level and remains at or above that level for 15 consecutive days.

e. Balancing Adjustment

In order to conserve water, the River Master is requested to utilize a balancing adjustment, based upon procedures agreed upon by the Decree Parties, when calculating the releases to be directed to meet the Montague flow objectives in Tables 1 and 2. Additionally, during Drought Warning, the amount of the conservation releases from the City Delaware Basin Reservoirs that is greater than the basic conservation release rates as set forth in Table 1 of Docket D77-20 (Revised) shall be considered as directed releases for the purpose of calculating the balancing adjustment.

6. TAILWATERS HABITAT PROTECTION and DISCHARGE MITIGATION PROGRAM (THPDMP)

a. Controlled Releases

There is hereby established a Tailwaters Habitat Protection and Discharge Mitigation Program (THPDMP), which consists of conservation releases designed for protection of the ecology in the tailwaters below the City Delaware Basin Reservoirs and discharge mitigation releases, designed to help mitigate the effects of flooding immediately below the City Delaware Basin Reservoirs. The City shall make such controlled releases from the City Delaware Basin Reservoirs in accordance with Figures 1 and 2 and Table 3.

Figure 1 defines five zones of combined reservoir usable storage relative to the existing three drought management curves (Drought Watch, Drought Warning, and Drought Emergency) and one additional curve that divides the existing Normal zone into two zones (L1 and L2). As defined in Table 3, each reservoir has an annual schedule of releases based on seasons, the quantity of combined reservoir usable storage, and the quantity of water available for the THPDMP in accordance with Paragraph b, below. For combined storage Zone L1, Figure 2 defines three zones of reservoir-specific storage (L1-a, L1-b and L1-c) relative to two rule curves for each reservoir. Table 3 further defines discharge mitigation releases based on reservoir-specific storage when combined storage is in Zone 1. When combined storage is below Zone L1, reservoir-specific storage zones as defined in Figure 2 are not relevant, and the releases to be made, as set forth in Table 3, are for conservation purposes only.

Table 3
Schedule Of Releases (cfs)
With 35 mgd Available

	Winter		Spring	Summer			Fall	
Cannonsville Storage Zone	Dec 1 - Mar 31	Apr 1 - Apr 30	May 1 - May 31	Jun 1 - Jun 15	Jun 16 - Jun 30	Jul 1 - Aug 31	Sep 1 - Sep 30	Oct 1 - Nov 30
L1-a	1500	1500	*	*	1500	1500	1500	1500
L1-b	250	*	*	*	*	350	275	250
L1-c	110	110	225	275	275	275	140	110
L2	80	80	215	260	260	260	115	80
L3	70	70	100	175	175	175	95	70
L4	55	55	75	130	130	130	55	60
L5	50	50	50	120	120	120	50	50

	Winter		Spring	Summer			Fall	
Pepacton Storage Zone	Dec 1 - Mar 31	Apr 1 - Apr 30	May 1 - May 31	Jun 1 - Jun 15	Jun 16 - Jun 30	Jul 1 - Aug 31	Sep 1 - Sep 30	Oct 1 - Nov 30
L1-a	700	700	*	*	700	700	700	700
L1-b	185	*	*	*	*	250	200	185
L1-c	85	85	120	150	150	150	100	85
L2	65	65	110	140	140	140	85	60
L3	55	55	80	100	100	100	55	55
L4	45	45	50	85	85	85	40	40
L5	40	40	40	80	80	80	30	30

	Winter		Spring	Summer			Fall	
Neversink Storage Zone	Dec 1 - Mar 31	Apr 1 - Apr 30	May 1 - May 31	Jun 1 - Jun 15	Jun 16 - Jun 30	Jul 1 - Aug 31	Sep 1 - Sep 30	Oct 1 - Nov 30
L1-a	190	190	*	*	190	190	190	190
L1-b	100	*	*	*	*	125	85	95
L1-c	65	65	90	110	110	110	75	60
L2	45	45	85	100	100	100	70	45
L3	40	40	50	75	75	75	40	40
L4	35	35	40	60	60	60	30	30
L5	30	30	30	55	55	55	25	25

* Storage zone does not apply during this period. Releases will be made in accordance with zone L1-c.

Table 3 (Continued)
Schedule Of Releases (cfs)
With 20 mgd Available

	Winter		Spring	Summer			Fall	
Cannonsville Storage Zone	Dec 1 - Mar 31	Apr 1 - Apr 30	May 1 - May 31	Jun 1 - Jun 15	Jun 16 - Jun 30	Jul 1 - Aug 31	Sep 1 - Sep 30	Oct 1 - Nov 30
L1-a	1500	1500	*	*	1500	1500	1500	1500
L1-b	250	*	*	*	*	350	275	250
L1-c	110	110	225	275	275	275	140	110
L2	72	72	194	234	234	234	104	72
L3	63	63	90	158	158	158	86	63
L4	50	50	68	117	117	117	50	54
L5	45	45	45	108	108	108	45	45

	Winter		Spring	Summer			Fall	
Pepacton Storage Zone	Dec 1 - Mar 31	Apr 1 - Apr 30	May 1 - May 31	Jun 1 - Jun 15	Jun 16 - Jun 30	Jul 1 - Aug 31	Sep 1 - Sep 30	Oct 1 - Nov 30
L1-a	700	700	*	*	700	700	700	700
L1-b	185	*	*	*	*	250	200	185
L1-c	85	85	120	150	150	150	100	85
L2	59	59	99	126	126	126	77	54
L3	50	50	72	90	90	90	50	50
L4	41	41	45	77	77	77	36	36
L5	36	36	36	72	72	72	27	27

	Winter		Spring	Summer			Fall	
Neversink Storage Zone	Dec 1 - Mar 31	Apr 1 - Apr 30	May 1 - May 31	Jun 1 - Jun 15	Jun 16 - Jun 30	Jul 1 - Aug 31	Sep 1 - Sep 30	Oct 1 - Nov 30
L1-a	190	190	*	*	190	190	190	190
L1-b	100	*	*	*	*	125	85	95
L1-c	65	65	90	110	110	110	75	60
L2	41	41	77	90	90	90	63	41
L3	36	36	45	68	68	68	36	36
L4	32	32	36	54	54	54	27	27
L5	27	27	27	50	50	50	23	23

* Storage zone does not apply during this period. Releases will be made in accordance with zone L1-c.

Table 3 (Continued)
Schedule Of Releases (cfs)
With 10 mgd Available

	Winter		Spring	Summer			Fall	
Cannonsville Storage Zone	Dec 1 - Mar 31	Apr 1 - Apr 30	May 1 - May 31	Jun 1 - Jun 15	Jun 16 - Jun 30	Jul 1 - Aug 31	Sep 1 - Sep 30	Oct 1 - Nov 30
L1-a	1500	1500	*	*	1500	1500	1500	1500
L1-b	250	*	*	*	*	350	275	250
L1-c	110	110	225	275	275	275	140	110
L2	65	65	175	212	212	212	94	65
L3	57	57	82	143	143	143	77	57
L4	45	45	61	106	106	106	45	49
L5	41	41	41	98	98	98	41	41

	Winter		Spring	Summer			Fall	
Pepacton Storage Zone	Dec 1 - Mar 31	Apr 1 - Apr 30	May 1 - May 31	Jun 1 - Jun 15	Jun 16 - Jun 30	Jul 1 - Aug 31	Sep 1 - Sep 30	Oct 1 - Nov 30
L1-a	700	700	*	*	700	700	700	700
L1-b	185	*	*	*	*	250	200	185
L1-c	85	85	120	150	150	150	100	85
L2	53	53	90	114	114	114	69	49
L3	45	45	65	82	82	82	45	45
L4	37	37	41	69	69	69	33	33
L5	33	33	33	65	65	65	24	24

	Winter		Spring	Summer			Fall	
Neversink Storage Zone	Dec 1 - Mar 31	Apr 1 - Apr 30	May 1 - May 31	Jun 1 - Jun 15	Jun 16 - Jun 30	Jul 1 - Aug 31	Sep 1 - Sep 30	Oct 1 - Nov 30
L1-a	190	190	*	*	190	190	190	190
L1-b	100	*	*	*	*	125	85	95
L1-c	65	65	90	110	110	110	75	60
L2	37	37	69	82	82	82	57	37
L3	33	33	41	61	61	61	33	33
L4	29	29	33	49	49	49	24	24
L5	24	24	24	45	45	45	20	20

* Storage zone does not apply during this period. Releases will be made in accordance with zone L1-c.

Table 3 (Continued)
Schedule Of Releases (cfs)
With 0 mgd Available

	Winter		Spring	Summer			Fall	
Cannonsville Storage Zone	Dec 1 - Mar 31	Apr 1 - Apr 30	May 1 - May 31	Jun 1 - Jun 15	Jun 16 - Jun 30	Jul 1 - Aug 31	Sep 1 - Sep 30	Oct 1 - Nov 30
L1-a	1500	1500	*	*	1500	1500	1500	1500
L1-b	250	*	*	*	*	350	275	250
L1-c	110	110	225	275	275	275	140	110
L2	58	58	157	190	190	190	84	58
L3	51	51	73	128	128	128	69	51
L4	40	40	55	95	95	95	40	44
L5	37	37	37	88	88	88	37	37

	Winter		Spring	Summer			Fall	
Pepacton Storage Zone	Dec 1 - Mar 31	Apr 1 - Apr 30	May 1 - May 31	Jun 1 - Jun 15	Jun 16 - Jun 30	Jul 1 - Aug 31	Sep 1 - Sep 30	Oct 1 - Nov 30
L1-a	700	700	*	*	700	700	700	700
L1-b	185	*	*	*	*	250	200	185
L1-c	85	85	120	150	150	150	100	85
L2	47	47	80	102	102	102	62	44
L3	40	40	58	73	73	73	40	40
L4	33	33	37	62	62	62	29	29
L5	29	29	29	58	58	58	22	22

	Winter		Spring	Summer			Fall	
Neversink Storage Zone	Dec 1 - Mar 31	Apr 1 - Apr 30	May 1 - May 31	Jun 1 - Jun 15	Jun 16 - Jun 30	Jul 1 - Aug 31	Sep 1 - Sep 30	Oct 1 - Nov 30
L1-a	190	190	*	*	190	190	190	190
L1-b	100	*	*	*	*	125	85	95
L1-c	65	65	90	110	110	110	75	60
L2	33	33	62	73	73	73	51	33
L3	29	29	37	55	55	55	29	29
L4	26	26	29	44	44	44	22	22
L5	22	22	22	40	40	40	18	18

* Storage zone does not apply during this period. Releases will be made in accordance with zone L1-c.

Figure 1
New York City Delaware System Usable Combined Storage
(Cannonsville, Pepacton and Neversink Reservoirs)

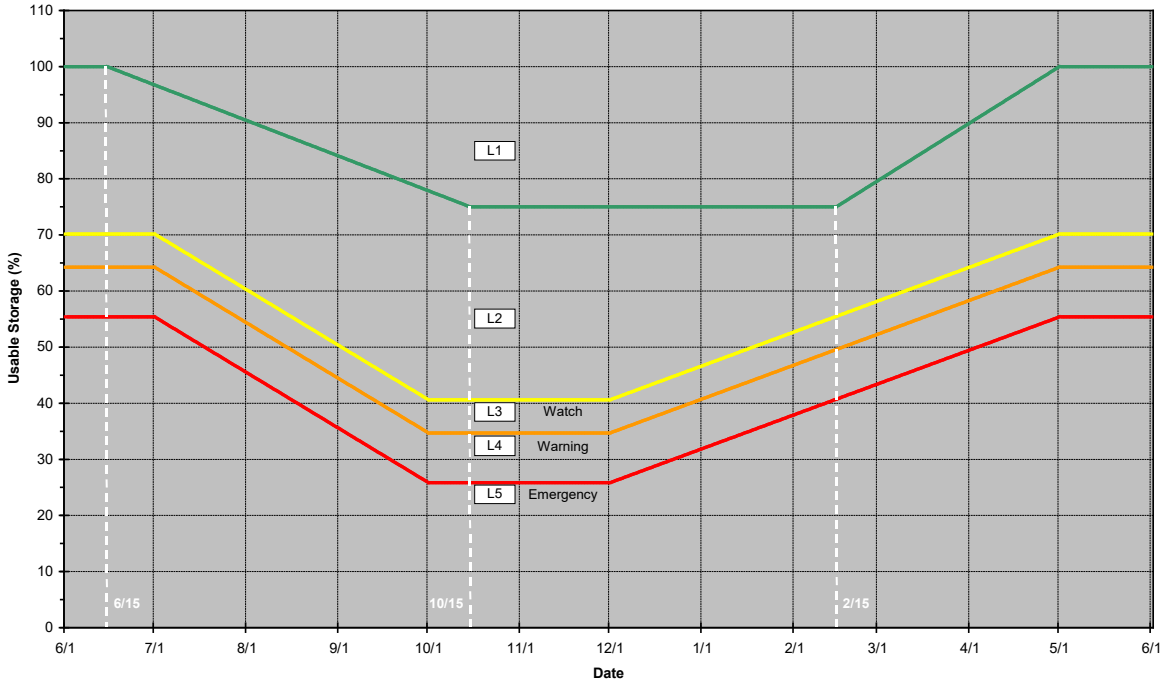
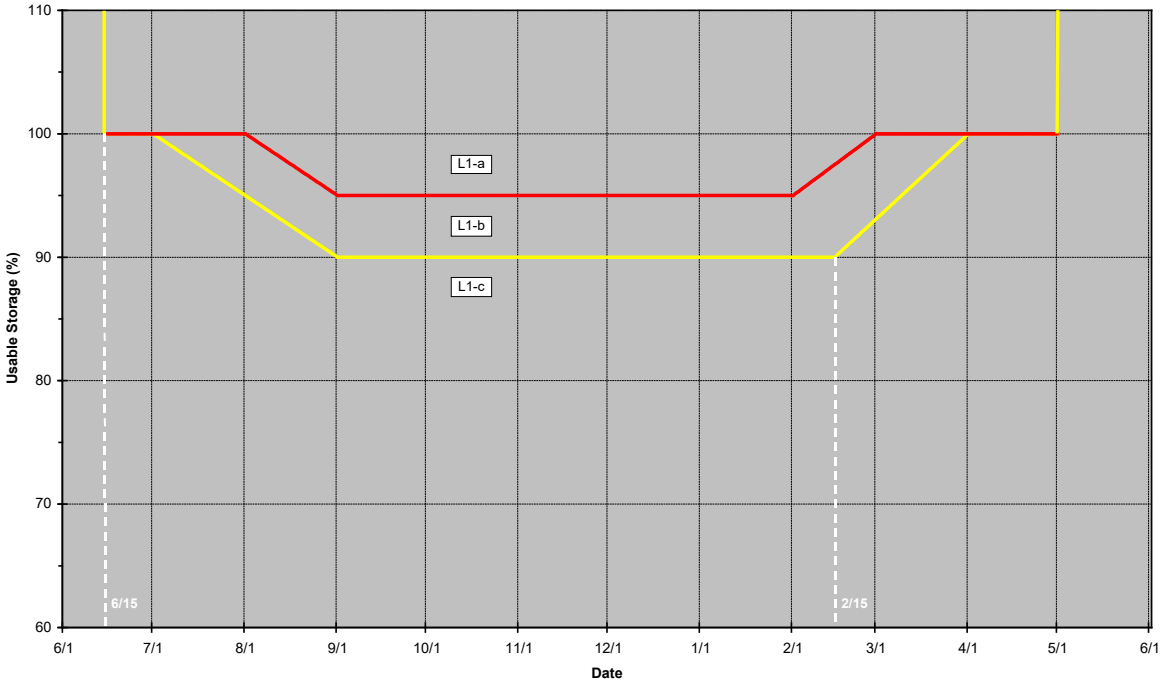


Figure 2
New York City Delaware System Usable Individual Storage
(Cannonsville, Pepacton and Neversink Reservoirs)



The City shall make discharge mitigation releases from the City Delaware Basin Reservoirs in accordance with the following:

i. For the period June 16 through April 30, if combined reservoir usable storage is in Zone L1 in accordance with Figure 1, discharge mitigation releases shall be made based upon individual reservoir usable storage in accordance with Zones L1-a, L1-b and L1-c as provided in Figure 2 and Table 3. During the period October 1 through April 30, fifty percent (50%) of the water equivalent of snow pack in the watersheds above the reservoirs shall be included in the determination of combined and individual reservoir usable storage in relation to Figures 1 and 2.

ii. For the period April 1 through April 30, if combined reservoir usable storage including snow pack is in excess of 100%, discharge mitigation releases shall be made based upon individual reservoir usable storage in accordance with Zone L1-a as provided in Figure 2 and Table 3.

iii. For the period May 1 through June 15, Zones L1-a and L1-b shall not be applicable in accordance with Figure 2, and discharge mitigation releases shall be made in accordance with Zone L1-c as provided in Figure 2 and Table 3.

iv. The NYCDEP and NYSDEC release managers may transfer spills to bottom releases to the extent possible and mutually agreed upon at any reservoir.

v. The current National Weather Service flood stage for the West Branch Delaware River at Hale Eddy is 11 feet. Accordingly, Zone L1discharge 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 discharge mitigation release, and releases shall be made in accordance with Zone L2 through L5 as provided in Table 3. This guidance may be modified at any time upon unanimous consent by the Decree Parties, if additional information demonstrates that a different cautionary stage should be used to limit the discharge mitigation releases.

vi. The current National Weather Service flood stage for the East Branch Delaware River at Fishs Eddy is 13.0 ft. Accordingly, Zone L1 discharge mitigation releases will not be made from Pepacton Reservoir when the river stage for the East Branch Delaware River at Fishs Eddy is above 11.0 ft. or is forecast to be above 11.0 ft. within 48 hours of a planned discharge mitigation release, and releases shall be made in accordance with Zone L2 through L5 as provided in Table 3. This guidance may be modified at any time upon unanimous consent by the Decree Parties, if additional information demonstrates that a different cautionary stage should be used to limit the discharge mitigation releases.

vii. The current National Weather Service flood stage for the Neversink River at Bridgeville is 13 feet. Accordingly, Zone L1 discharge 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 discharge mitigation release, and releases shall be made in accordance with Zone L2 through L5 as provided in Table 3. This guidance may be modified at any time upon unanimous consent by the Decree Parties, if additional information demonstrates that a different cautionary stage should be used to limit the discharge mitigation releases.

viii. Discharge 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.

ix. Discharge 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 in Table 4 below. Respective controlled releases will be reduced to L2 releases in Table 3, or lower.

x. To more naturally effect downward or upward transitions between discharge mitigation release rates identified in Table 3, discharge mitigation release rates may be ramped generally over a period not to exceed three days at Cannonsville and Pepacton Reservoirs or two days at Neversink Reservoir, but in increments no less than 10 cfs at any reservoir.

Table 4
Maximum Combined Discharge Rates

Reservoir	*Maximum Combined Discharge Rate (cfs)*
Neversink	3,400
Pepacton	2,400
Cannonsville	4,200

b. Sustainability

The sustainable source of water for releases in accordance with the THPDMP described herein is the possible construction of an additional 13 billion gallons of combined storage at the Cannonsville and Pepacton Reservoirs, the feasibility of which is being evaluated by NYS and the City. This possible additional storage will be constructed for the primary purpose of supporting a sustainable fisheries program. Prior to construction, the Decree Parties shall unanimously agree on any additional purposes for which such storage will be used. In addition, an operating plan covering filling and drawdown of the storage may be prepared, for consideration and unanimous approval by the Decree Parties. With this possible additional storage the releases in Table 3 with 35 MGD shall be applicable. Until such time as the construction of that additional storage is completed, but not later than December 31, 2012, unless a later date is agreed upon by the Decree Parties, an interim source of water for the THPDMP shall be provided from such unused portion of the New York City diversion allocation of 800 million gallons per day under Normal conditions as may be available from year to year and from such portion of the IERQ as may be approved for such use from year to year by all of the Downbasin Parties (DE, NJ and PA) as provided for below.

Each year, the City shall estimate and report to the River Master the anticipated quantity of unused allocation, not to exceed 35 mgd, from the City Delaware Basin Reservoirs for the ensuing year. Such estimated amount shall be available for use for the THPDMP.

In any year in which the City's estimated quantity of unused allocation is less than 35 mgd, the Downbasin Parties may determine and report to the River Master a quantity of the IERQ which may be made available for use for the THPDMP for that year, not to exceed the difference between 35 mgd and the quantity estimated by the City for that year. Such quantity shall be deducted from the IERQ.

In the event that less than 35 mgd combined is available from the City's unused allocation and the portion of the IERQ approved by the Downbasin Parties for this purpose, in any year, or if during any year, an unanticipated emergency renders unavailable a portion or all of the City's unused allocation or the IERQ, the THPDMP releases shall be determined in accordance with Table 3 based upon the quantity of water available. Subsequent to December 31, 2012, if the proposed additional storage is not completed, then releases shall be made in accordance with Table 3 for 0 MGD, unless otherwise agreed upon by the Decree Parties.

7. DISCHARGE MITIGATION

Discharge mitigation releases designed to reduce discharges from the City Delaware Basin Reservoirs during periods of high flow shall be made in quantities described in the THPDMP.

8. SALINITY REPULSION

The operating objective should be to limit salinity in the Delaware Estuary to a maximum 30-day average of 180 parts per million of chlorides and a maximum 30-day average of 100 parts per million of sodium at River Mile 98 (i.e., one mile upstream of the Walt Whitman Bridge), unless the salinity repulsion flows necessary for estuary and bay ecological health, as addressed in Section12, require a more stringent limit.

9. DWARF WEDGE MUSSELS

The Decree Parties and the DRBC agree to review and evaluate available data during the implementation of this FFMP and will consider any modifications that may be necessary to avoid taking, harming, or adverse effects on Dwarf Wedge Mussels.

10. LAKE WALLENPAUPACK

The Decree Parties and the DRBC agree to evaluate seasonal or snowpack-based discharge mitigation programs, as may be proposed by the operators of Lake Wallenpaupack, and consider any modifications to the Lake Wallenpaupack operations plan (Resolution 2002-33) that may be required to implement such programs, if found feasible.

11. RECREATIONAL BOATING

The Decree Parties and the DRBC agree to evaluate potential release programs, if proposed, for supporting whitewater boating activities and provide a report of potential alternatives and recommendations for such release programs, if found feasible.

12. ESTUARY AND BAY ECOLOGICAL HEALTH

The Decree Parties and the DRBC agree to review and evaluate available data during the implementation of this FFMP and will recommend modifications that may be necessary to maintain the ecological health of the Delaware Estuary and Bay including that of oysters, shellfish and endangered species. The focus of this FFMP element includes the Upper Delaware Estuary, Lower Delaware Estuary, and Delaware Bay, and such modifications shall be considered in accordance with the criteria described in Section 1.b.

13. WARM-WATER AND MIGRATORY FISH

The Decree Parties and the DRBC agree to review and evaluate available information on the effects of implementation of this FFMP on warm-water fishes that occur in the Delaware River and will consider any modifications to conserve native species of special concern and migratory species. Efforts will be made to improve the knowledge of the populations, habitats, and needs of these species to inform the adaptive management process.

14. MONITORING AND REPORTING

NYSDEC shall, on April 30 of each year, submit to the Decree Parties and to the DRBC annual status reports on the effectiveness of the THPDMP. Discussion of such reports shall be included as an agenda item at annual meetings of the Delaware River Master Advisory Committee.

NYSDEC shall conduct a biological monitoring program in 2009 and thereafter, once every five years, in accordance with the NYSDEC "Monitoring Plan for the Delaware River Tailwaters."

By March 31, 2011, and every 5 years thereafter, NYSDEC shall submit to the Decree Parties and to the DRBC a scientific report describing the effects on the fishery and other aquatic resources resulting from implementation of the THPDMP. Such report shall include an abstract or executive summary, statements of purpose, scope and objectives, procedures, results, conclusions, recommendations for additional work if warranted, and supporting literature, and shall describe effects on the fishery and other aquatic resources resulting from implementation of the THPDMP.

By April 30, 2009 and every two years thereafter, NYSDEC and the City shall submit to the Decree Parties and to the DRBC a status report on the effort by New York State to secure funding and implement the construction of additional storage in the City's Delaware Basin Reservoirs. Such reports shall discuss potential alternative funding sources and include an estimated phased construction schedule for such work and projected completion dates.

15. REASSESSMENT STUDY

In accordance with Section VIII of the "Recommendations of the Parties to the U.S. Supreme Court Decree of 1954 to the Delaware River Basin Commission Pursuant to Commission Resolution 78-20 (with appendices), known as the "Good Faith" agreement" of 1983, whereby the Decree Parties agreed that in consultation with the DRBC, they would periodically review the "Good Faith" agreement and recommend such adjustments or modifications thereto as might

be required to respond to changing conditions, the Decree Parties hereby agree to conduct a comprehensive reassessment (Reassessment Study) of the safe yield (to the extent described in this Section) and operations of selected Basin reservoirs and the Delaware and Raritan Canal, including a reassessment of the Montague and Trenton flow objectives, as well as complete detachment of the salt front vernier.

The objectives of the Reassessment Study will be: (a) to identify current issues and concerns related to continued operations under the 1983 Good Faith Agreement; (b) to identify alternatives for Basin reservoir operations (NYC and non-NYC impoundments), to optimize the system of usage of waters of the Basin for water supply management under routine and drought conditions and for flood mitigation, fisheries management, and overall ecological protection of the River system, while maintaining Decree Party equity established by the Decree; and (c) to establish recommendations for improved water management planning in the Basin. All of the Decree Parties agree to provide information on current and contemplated use of Basin water.

The Reassessment Study shall also include evaluation of the components used in the calculation of the ERQ as defined in the Decree. NYCDEP will calculate the safe yield of the City Water Supply System based on the most current information available and will calculate the expected annual consumption of the City Water Supply System. The safe yield calculation and its supporting data will be provided by the NYCDEP for purposes of analyses called for in this Agreement. NYCDEP recognizes that this information may be utilized for analyses outside of the scope of this Agreement; such analyses shall not be used or relied upon in connection with the Reassessment Study. The Reassessment Study to be conducted pursuant to this Agreement shall not revise or test other assumptions for the safe yield of New York City's water supply system.

The Reassessment Study should reflect yield and operations based upon existing infrastructure, and should consider opportunities for additional storage, including water storage purchases, infrastructure enhancements, treatment upgrades, water conservation and water reuse. The Reassessment Study also should include a comprehensive review of the current rule curves and the drought recovery criteria as it relates to the resumption of normal diversions, Montague and Trenton flow objectives and conservation releases. However, nothing in this Agreement shall be construed as amending or expressing an intention to amend the existing rights of the Decree Parties contained in the Decree to diversions and releases to meet flow objectives. For each recommendation identified, the associated opportunities/benefits and challenges/detriments should be described. The Reassessment Study should be closely coordinated with activities undertaken in connection with the DRBC Flood Mitigation Task Force Action Plan.

The Decree Parties agree to provide funds to the DRBC to engage an independent contractor to conduct the Reassessment Study, the cost of which shall be equitably shared by the Decree Parties. DRBC shall solicit qualified consultants utilizing a request for proposals (RFP) process. The DRBC Executive Director shall convene a Reassessment Steering Committee, consisting of a representative from each of the Decree Parties and the Federal Government, which shall direct the scope and conduct of the Reassessment Study. The RFP to be utilized in soliciting bids from qualified consultants, including the scope of services, shall be subject to the review and unanimous approval of the Decree Parties, as shall the selection of the consultant chosen to undertake the Study. Final products of the Reassessment Study are expected within the three-year time frame of this FFMP, but a firm estimate of cost and timeline will be solicited as part of the RFP process. DRBC and the Decree Parties will provide the contractor with access to all data required for the

Reassessment Study. These data shall include but shall not be limited to storage criteria, safety factors, per capita use, seasonal demand patterns, physical limitations on conveyance, secondary augmentation storage, population served, projected demands, reductions in water demand as a result of water conservation efforts or water reuse, expenditures on water conservation measures, the investigation and construction of additional storage, or the purchase of supplemental water sources, and current and expected peak day, peak month, and annual average and conjunctive use constraints, such as water quality and storage levels. Data or information that are sensitive from a security standpoint may be withheld by any Decree Party, unless arrangements acceptable to such Decree Party are put in place to protect the confidentiality of such data or information. The final report shall not include any such sensitive information unless consented to by the Decree Party providing same.

If consensus is reached based on the findings of this Reassessment Study, it is the intention of the Decree Parties to consider and potentially to adopt revisions to operating procedures, revisions to laws and regulations, or other changes to policies or procedures as may be necessary to implement such findings. Where appropriate, such revisions or changes may be incorporated into rules and/or dockets established by the DRBC following public notice and a hearing.

16. PERIODIC EVALUATION AND REVISION

In order to support an adaptive management process and to improve over time the scientific basis for the various elements of the FFMP, periodic evaluation of the elements shall be required of the appropriate Decree Parties or DRBC. Such evaluations shall be conducted in accordance with evaluation plans approved by the Decree Parties and DRBC. Components of the evaluation plans shall include: evaluation need(s), purpose and scope, objectives, approach and methods, evaluation benefits, content of planned reports, evaluation schedule, personnel needs, budget, source of funds and, where appropriate, results of previous investigations.

The Decree Parties and the DRBC shall, at the conclusion of the DRBC rulemaking process, consider whether any revisions to the FFMP should be made on the basis of the public comments received. In addition, the Decree Parties and the DRBC shall annually evaluate the results of the FFMP, relative to the purposes described in Section 1.a and other water uses and considerations as may be deemed appropriate, including consideration of any evaluations that have been completed within the previous year and input from the public. The Decree Parties agree that during the entire effective period of this Agreement, as monitoring, reporting and evaluation may show to be appropriate, the provisions of this agreement specifying triggers for and quantities of releases may be revised through an adaptive management process to further enhance the overall natural resource and economic benefits derived from the releases from the City Delaware Basin Reservoirs. Any resultant action taken shall be subject to the unanimous approval of the Decree Parties, except that temporary modifications for purposes such as maintenance or to avoid unreasonable sub-daily fluctuations in releases shall not require Decree Party approval.

17. TEMPORARY SUSPENSION OR MODIFICATION

From time to time, the Decree Parties and DRBC may agree that emergencies, short-term needs, or unanticipated effects of the FFMP may require temporary suspension or modification of one or more of the provisions herein. In considering such temporary suspensions or modifications, the Decree

Parties and DRBC may estimate probabilities and risks associated with the temporary suspensions or modifications. Any resultant action taken shall be subject to the unanimous approval of the Decree Parties.

18. RESERVATIONS

Nothing contained herein shall be deemed to constitute a waiver or modification of, or limitation on, NYC's right to divert up to an average of 800 mgd, combined, out of the basin from the City Delaware Basin Reservoirs or New Jersey's right to divert up to an average of 100 mgd out of the basin, or the Lower Basin Parties' right to releases from the City Delaware Basin Reservoirs sufficient to maintain the 1,750-cfs Montague flow objective, consistent with the terms of the Decree. This Agreement shall not be cited as precedent of any intention to waive or modify or limit the above-cited rights. Notwithstanding this reservation of rights, the Decree Parties intend to be legally bound by the terms and conditions of this Agreement.

The Decree Parties and DRBC have authorized certain actions, including but not limited to discharge mitigation releases, in this Agreement to assist in mitigating the impacts of flooding immediately below the NYC Delaware Basin Reservoirs. By incorporating flood mitigation as an objective and taking the actions provided herein, the Decree Parties and DRBC do not create or assume any duties or obligations regarding flood mitigation or in any way modify any such duties or obligations that may be otherwise prescribed by law.

19. EFFECTIVE DATE

This Agreement shall take effect upon unanimous consent of the Decree Parties and shall expire on May 31, 2011, unless renewed as provided for in Section 20 or the expiration date is revised.

20. RENEWAL AND REVISION

This Agreement may be revised only through the unanimous written agreement of the Decree Parties. The Decree Parties agree to consider the results of the Reassessment identified in Section 15, including possible changes to the Drought Operations Plan as defined under the "Good Faith Agreement" and modified herein, as they become available. Revisions to the Drought Operations Plan based upon such reassessment, may be incorporated into this Agreement through the unanimous approval of the Decree Parties. This Agreement, and any unanimously agreed to revisions, may be renewed for an additional 5-year period beginning June1, 2011 by unanimous written agreement of all the Decree Parties and adoption by DRBC prior to May 31, 2011. If renewed for such additional 5-year period, the Agreement shall thereafter automatically renew in five-year increments, unless terminated as provided for in Section 21. If this Agreement is not renewed for the additional 5-year period, prior to May 31, 2011, the Decree Parties agree to enter into good faith negotiations to determine a course of action in the absence of such renewal.

21. TERMINATION and REVERSION

Any Decree Party may terminate the Agreement on any automatic renewal date, commencing with the June 1, 2016 renewal date, by providing notice to the other Decree Parties, no less than 180 days prior to such renewal date, of its intent to terminate the agreement on such renewal date. If timely

notice of intent to terminate is given, the Decree Parties agree to enter into good faith negotiations to determine a course of action in the absence of such renewal. Upon any failure by all Decree Parties to continue this Agreement, and any revisions to this Agreement, in accordance with Section 20, in effect either on June 1, 2011 or any renewal period thereafter, and in the absence of agreement upon a course of action as provided in Section 20 and this section, operations shall revert to those provided in Docket D-77-20 CP (Revised). The Decree Parties agree to use their best efforts to develop by June 1, 2011 appropriate amelioration for fisheries habitat protection in accordance with Article 3 of Resolution 2002-33 (the new PPL Drought Management Plan), to be applied in conjunction with such operations.

In determining the course of action as provided above, the Decree Parties also agree to consider means by which the provisions of Tables 1 and 2, related to the NJ Diversion and the City detachment from the salt front vernier, can be continued under such course of action while preserving the Downbasin Parties' interests.

22. RESCISSION AND NULLIFICATION

The Parties recommend that the DRBC rescind Resolutions and Dockets D-77-20 CP (Revision 2) through D-77-20 CP (Revision 10), to the extent each has not already expired. This Agreement shall be null and void, and of no further force and effect, if such recissions are not effected.

STATE OF DELAWARE

The State of Delaware hereby approves this Agreement of the Parties to the U.S. Supreme Court Decree of 1954 for a Flexible Flow Management Program and recommends that this Agreement be submitted to the Delaware River Basin Commission for implementation as appropriate through rules, dockets and/ or resolutions, subject in each instance to the further agreement of the Parties as required by Section 3.3(a) of the Delaware River Basin Compact.

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STATE OF NEW JERSEY

The State of New Jersey hereby approves this Agreement of the Parties to the U.S. Supreme Court Decree of 1954 for a Flexible Flow Management Program and recommends that this Agreement be submitted to the Delaware River Basin Commission for implementation as appropriate through rules, dockets and/ or resolutions, subject in each instance to the further agreement of the Parties as required by Section 3.3(a) of the Delaware River Basin Compact.

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CITY OF NEW YORK

The City of New York hereby approves this Agreement of the Parties to the U.S. Supreme Court Decree of 1954 for a Flexible Flow Management Program and recommends that this Agreement be submitted to the Delaware River Basin Commission for implementation as appropriate through rules, dockets and/ or resolutions, subject in each instance to the further agreement of the Parties as required by Section 3.3(a) of the Delaware River Basin Compact.

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STATE OF NEW YORK

The State of New York hereby approves this Agreement of the Parties to the U.S. Supreme Court Decree of 1954 for a Flexible Flow Management Program and recommends that this Agreement be submitted to the Delaware River Basin Commission for implementation as appropriate through rules, dockets and/ or resolutions, subject in each instance to the further agreement of the Parties as required by Section 3.3(a) of the Delaware River Basin Compact.

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COMMONWEALTH OF PENNSYLVANIA

The Commonwealth of Pennsylvania hereby approves this Agreement of the Parties to the U.S. Supreme Court Decree of 1954 for a Flexible Flow Management Program and recommends that this Agreement be submitted to the Delaware River Basin Commission for implementation as appropriate through rules, dockets and/ or resolutions, subject in each instance to the further agreement of the Parties as required by Section 3.3(a) of the Delaware River Basin Compact.

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Appendix 2. Flexible Flow Management Program Effective December 10, 2008

Agreement of the Parties to the 1954 U.S. Supreme Court Decree Effective December 10, 2008

1. FLEXIBLE FLOW MANAGEMENT PROGRAM
   a. Program Established
   b. Criteria For Flexible Flow Management Program Modification
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   a. New York City
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3. FLOW OBJECTIVES
   a. Montague Flow Objective
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4. RELEASES
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5. DROUGHT MANAGEMENT
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6. TAILWATERS HABITAT PROTECTION and DISCHARGE MITIGATION PROGRAM
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8. SALINITY REPULSION
9. DWARF WEDGE MUSSELS
10. LAKE WALLENPAUPACK
11. RECREATIONAL BOATING
12. ESTUARY AND BAY ECOLOGICAL HEALTH
13. WARM-WATER AND MIGRATORY FISH
14. MONITORING AND REPORTING

15. REASSESSMENT STUDY
16. PERIODIC EVALUTION AND REVISION
17. TEMPORARY SUSPENSION OR MODIFICATION
18. RESERVATIONS
19. EFFECTIVE DATE
20. RENEWAL AND REVISION
21. TERMINATION AND REVERSION
22. RESCISSION AND NULLIFICATION

An Agreement, consented to by the Parties (the State of Delaware (DE), the State of New Jersey (NJ), the State of New York (NY), the Commonwealth of Pennsylvania (PA), and the City of New York (NYC or City); hereafter Decree Parties) to the Amended Decree of the U.S. Supreme Court in New Jersey v. New York, 347 U.S. 995 (1954), (hereafter Decree) and proposing to modify and supercede certain provisions of Delaware River Basin Commission (DRBC) Resolutions D-77-20 CP (Revised) (also referred to as Revision 1) and subsequent revisions, to establish a Flexible Flow Management Program (FFMP) for managing diversions and releases under the Decree. The Parties hereby agree to the following and support adoption of appropriate Delaware River Basin Water Code revisions by the DRBC.

1. FLEXIBLE FLOW MANAGEMENT PROGRAM

a. Program Established

A Flexible Flow Management Program, as described in Sections 2 through 17, herein, is hereby established, whereby the Decree Parties shall manage diversions and releases under the Decree. The FFMP is designed to provide safe and reliable supplies of water essential to serve the needs of over 17 million people who depend on water from the 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 to help sustain cold water fisheries; 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 incorporates the elements provided in Sections 2 through 17, recognizing that various elements may require further study and investigation either prior to or during implementation and that some elements may therefore be implemented prior to others. It is also recognized that other elements may be added in the future, upon unanimous agreement of the Decree Parties, when or if identified. Addition of, or modifications to, elements of the FFMP may require adjustments or modifications to other prior established elements.

b. Criteria For Flexible Flow Management Program Modification

In reviewing proposed modifications to address the purposes of the FFMP, as provided in Sections 15, 16 and 17 herein, the Decree Parties and the DRBC will consider criteria that may include, without any particular priority, but are not limited to, the following:

i. Decree Party equity
ii. Net benefits and costs to environmental and economic resources
iii. Source and sustainability of water available to support modification and the environmental or economic resource(s)
iv. Habitat types—with naturally-occurring habitats receiving consideration over man-made habitats
v. Scientific basis for modification
vi. Impacts to drought management, water supply and flood mitigation, including but not limited to: 1) frequency, duration and seasonal timing of the various levels of drought; and 2) frequency, duration, levels of storage, diversions, releases and flows
vii. Extent to which the diversions and the Montague minimum basic rate of flow provided in the Decree are met

viii. Potential impacts to water quality, existing National and State Pollution Discharge Elimination System permits and the assimilative capacity of the Delaware River
ix. Ease and practicability of operation
x. Consistency with adaptive management principles
xi. Applicability and implementation of water conservation practices
xii. Impacts to salinity

The Decree Parties agree to evaluate these parameters as well as potential additional parameters, and provide a report with recommendations.

2. DIVERSIONS

a. New York City

In accordance with Sections III. A. 3-4 of the Decree, and subject to the limitations provided herein, at no time during any twelve-month period, commencing June 1, shall the aggregate total quantity of water diverted by the City, divided by the number of days elapsed since the preceding May 31, exceed 800 million gallons per day (mgd). The City shall be subject to the releases and flow objectives described herein.

b. New Jersey

In accordance with Section V of the Decree, except with respect to limitations provided herein, the State of New Jersey may divert outside the Delaware River watershed, from the Delaware River or its tributaries in New Jersey, without compensating releases, the equivalent of 100 mgd under the supervision of the Delaware River Master (River Master) established by the Decree and shall be subject to the following conditions and obligations:

i. Until the State of New Jersey builds and utilizes one or more reservoirs to store waters of the Delaware River or its tributaries for the purpose of diverting the same to another watershed, or purchases or leases reallocated water or new storage from an existing or new storage facility, the State of New Jersey may divert not to exceed 100 mgd as a monthly average, with the diversion on any day not to exceed 120 million gallons.

ii. If and when the State of New Jersey has built and is utilizing one or more reservoirs to store waters of the Delaware River or its tributaries for the purpose of diversion to another watershed, it may withdraw water from the Delaware River or its tributaries into such impounding reservoirs without limitation except during the months of July, August, September and October of any year, when not more than 100 mgd as a monthly average and not more than 120 million gallons in any day shall be withdrawn. This restriction may be modified upon unanimous consent of the Decree Parties should the State of New Jersey purchase or lease reallocated water or new storage from an existing or new facility.

iii. Regardless of whether the State of New Jersey builds and utilizes storage reservoirs for diversion, its total diversion for use outside of the Delaware River watershed without compensating releases shall not exceed an average of 100 mgd during any calendar year.

3. FLOW OBJECTIVES

a. Montague Flow Objective

In accordance with Section III. B. 1. (b) of the Decree, except with respect to limitations provided herein, releases from the City Delaware Basin Reservoirs shall be in quantities designed to maintain a minimum basic rate of flow during Normal conditions at the gaging station of the United States Geological Survey (U.S.G.S.) at Montague of 1,750 cubic feet per second (cfs) during the period from September 16 through June 14 and 1,850 cfs during the period June 15 through September 15 in accordance with Section 4.c., as directed by the River Master in accordance with Section VII of the Decree.

The Decree Parties agree to evaluate the desirability of and alternatives to the existing Montague flow objective, including consideration of the availability of increased storage, and provide a report with recommendations within three years after the effective date of this Agreement. If a recommendation for change is made, the impact on the Trenton flow objective (see Paragraph b. below) shall be assessed.

b. Trenton Flow Objective

Section 2.5.3 of DRBC's Delaware River Basin Water Code (Water Code) establishes a set of flow objectives at Trenton, NJ to control salinity intrusion in the Delaware Estuary.

Upon the request of one or more of the Decree Parties or the DRBC, the Decree Parties and the DRBC agree to evaluate the desirability of and alternatives to the existing Trenton flow objective, including consideration of the availability of increased storage and the Montague flow objective, and provide a report with recommendations within three years after such request.

4. RELEASES

a. Conservation Releases from the City Delaware Basin Reservoirs

Conservation releases designed for protection of the ecology in the tailwaters below the City Delaware Basin Reservoirs, including water quality, recreation, and fishery habitat needs, shall be made in quantities described in the Tailwater Habitat Protection and Discharge Mitigation Program (THPDMP) in Section 6 below.

b. Excess Release Quantity

For an interim period ending May 31, 2011, the Decree Parties agree to use the Excess Release Quantity, as defined in the Decree, in support of an Interim Excess Release Quantity as defined in Paragraph c. below.

c. Interim Excess Release Quantity

For an interim period ending May 31, 2011, an Interim Excess Release Quantity (IERQ) shall be provided in conjunction with the NJ increased diversions and elimination of the Drought Emergency

salt-front vernier as provided herein, and an increased Montague objective of 1,850 cfs during basinwide Normal conditions. The IERQ is computed as 83 percent of the difference between the highest year's consumption of the NYC water supply system during the past five years of 1,257 mgd and NYC's current estimate of continuous safe yield of the NYC water supply system of 1,290 mgd obtainable without pumping. The continuous safe yield shall be subject to review under the Reassessment provided in Section 15. The IERQ shall be 15,468 cfs-days, except during any leap year the IERQ shall be 17,125 cfs-days.

NYC shall release the IERQ provided for above at rates designed to increase the flow at Montague from 1,750 cfs to 1,850 cfs for the period commencing on June 15 and continuing through September 15, and to maintain a flow at Trenton of 3,000 cfs during basinwide Normal conditions for the period commencing on June 15 and continuing through March 15 referred to as the "seasonal period." The IERQ required to be released in any seasonal period shall in no event exceed 70 billion gallons. In releasing the IERQ, NYC shall not be required to release at rates exceeding the capacity of its release works. NYC shall in each seasonal period continue its temporary releases until the aggregate quantity of the releases from the IERQ is equal to the total quantity of the IERQ as provided above.

The Decree Parties agree to investigate long-term measures including consideration of actions the lower basin states can take that will make adequate water available to support the NJ diversions and NYC detachment of the Montague objective from the salt front vernier during Drought Emergency.

d. Interim Excess Release Quantity Extraordinary Needs Bank

In addition to the hydrologic criteria described in Section 2.5.6 A. of the Delaware River Basin Water Code and subject to other provisional uses of the IERQ as provided herein including Section 6.b, the Decree Parties, the DRBC and the Delaware River Master may at any time review extraordinary water needs to support such research, aquatic life or other water-use activity as may be approved by the DRBC. Upon unanimous agreement, the Decree Parties may bank all or a portion of the IERQ remaining at such time, and such portion shall be placed in an "IERQ Extraordinary Needs Bank" and used to provide for such extraordinary water needs. Such quantity as may be so banked shall be deducted from the IERQ.

5. DROUGHT MANAGEMENT

Figure 1 defines five zones of combined reservoir usable storage relative to the existing three drought management curves (Drought Watch, Drought Warning, and Drought Emergency) and one additional curve that divides the existing Normal zone into two zones (L1 and L2).

The following drought stage definitions and procedures will be in effect:

a. Drought Watch (L3)

The seasonally segmented line (shown as dashes) splitting the current "Drought Warning" in Figure 1 of DRBC Resolution No. 83-13 and DRBC Docket No. D-77-20 CP (Revised) is raised by four (4) billion gallons during the entire year. In addition, the upper half of the Drought Warning, previously referred to as DW1, is renamed Drought Watch, with diversions and flow objectives as shown in Table 1.

b. Drought Warning (L4)

The lower half of the Drought Warning (DW2), based upon the rule curves included in DRBC Resolution No. 83-13 and as modified by Paragraph a. above, is designated Drought Warning, with diversions and flow objectives as shown in Table 1.

c. Drought Emergency (L5)

The operation level formerly named "Drought" in accordance with the rule curves included in DRBC Resolution No. 83-13 and Docket D77-20 (Revised) is hereby renamed "Drought Emergency." During Drought Emergency, diversions shall be limited as shown in Table 1. The Montague and Trenton flow objectives are as shown in Tables 1 and 2.

Table 1
Interstate Operation Formula
For Diversions, Releases And Flow Objectives

NYC Storage Condition	*NYC Diversion (mgd)*	*NJ Diversion (mgd)*	*Montague Flow Objective (cfs)*	*Trenton Flow Objective (cfs)*
Normal (June 15 – Sept 15)	800	100	1,850*	3,000
Normal (Sept 16 – June 14)	800	100	1,750	3,000
Drought Watch (L3)	680	100	1,650	2,700
Drought Warning (L4)	560	85	1,550	2,700
Drought Emergency (L5)	520	85	1,100-1,500**	2,500-2,900***
Severe Drought	(to be negotiated depending upon conditions)			

* To the extent supported by the IERQ pursuant to Section 4.c., otherwise 1,750 cfs

** Varies with time of year, in accordance with Table 2

*** Varies with time of year and location of salt front, in accordance with Table 2

Table 2
Interstate Operation Formula
For Adjusting Montague And Trenton Flow Objectives
During Drought Emergency (L5) Operations

	Flow Objective (cfs)						
	Trenton			*Montague*			
7-Day Average Location of "Salt Front" (river-mile**)*	*Dec 1 - Apr 30*	*May 1 - Aug 31*	*Sep 1 - Nov 30*	*June 1 - June 30*	*July 1 - Nov 30*	*Dec 1 - Dec 31*	*Jan 1 - May 31*
-	-	-	-	1,450	1,500	1,350	1,100
Upstream of R.M. 92.5	2,700	2,900	2,900				
R.M. 87.0 – R.M. 92.5	2,700	2,700	2,700				
R.M. 82.9 – R.M. 87.0	2,500	2,500	2,500				
Downstream of R.M. 82.9	2,500	2,500	2,500				

* Defined as the 250 mg/L isochlor in the Delaware Estuary

** Measured in statute miles along the center of the navigation channel, from the mouth of the Delaware Bay

d. Entry and Exit Criteria

Criteria for entry into and exit from the various stages of drought operations shall be in accordance with Section 2.5.3.E of the Delaware River Basin Water Code. L2 or higher level releases will be restored when combined storage in the three City Delaware Basin Reservoirs reaches 25 billion gallons above the drought watch level and remains at or above that level for 15 consecutive days.

e. Balancing Adjustment

In order to conserve water, the River Master is requested to utilize a balancing adjustment, based upon procedures agreed upon by the Decree Parties, when calculating the releases to be directed to meet the Montague flow objectives in Tables 1 and 2. Additionally, during Drought Warning, the amount of the conservation releases from the City Delaware Basin Reservoirs that is greater than the basic conservation release rates as set forth in Table 1 of Docket D77-20 (Revised) shall be considered as directed releases for the purpose of calculating the balancing adjustment.

6. TAILWATERS HABITAT PROTECTION and DISCHARGE MITIGATION PROGRAM (THPDMP)

a. Controlled Releases

There is hereby established a Tailwaters Habitat Protection and Discharge Mitigation Program (THPDMP), which consists of conservation releases designed for protection of the ecology in the tailwaters below the City Delaware Basin Reservoirs and discharge mitigation releases, designed to help mitigate the effects of flooding immediately below the City Delaware Basin Reservoirs. The City shall make such controlled releases from the City Delaware Basin Reservoirs in accordance with Figures 1 and 2 and Table 3.

Figure 1 defines five zones of combined reservoir usable storage relative to the existing three drought management curves (Drought Watch, Drought Warning, and Drought Emergency) and one additional curve that divides the existing Normal zone into two zones (L1 and L2). As defined in Table 3, each reservoir has an annual schedule of releases based on seasons, the quantity of combined reservoir usable storage, and the quantity of water available for the THPDMP in accordance with Paragraph b, below. For combined storage Zone L1, Figure 2 defines three zones of reservoir-specific storage (L1-a, L1-b and L1-c) relative to two rule curves for each reservoir. Table 3 further defines discharge mitigation releases based on reservoir-specific storage when combined storage is in Zone 1. When combined storage is below Zone L1, reservoir-specific storage zones as defined in Figure 2 are not relevant, and the releases to be made, as set forth in Table 3, are for conservation purposes only.

Table 3
Schedule Of Releases (cfs)
With 35 mgd Available

	Winter		Spring		Summer			Fall		
Cannonsville	Dec 1 -	Apr 1 -	May 1 -	May 21 -	Jun 1 -	Jun 16 -	Jul 1 -	Sep 1 -	Sep 16 -	Oct 1 -
Storage Zone	31-Mar	30-Apr	20-May	31-May	15-Jun	30-Jun	31-Aug	15-Sep	30-Sep	30-Nov
L1-a	1500	1500	*	*	*	1500	1500	1500	1500	1500
L1-b	250	*	*	*	*	*	350	300	275	250
L1-c	110	110	200	250	275	275	275	275	140	110
L2	80	80	190	240	260	260	260	260	115	80
L3	70	70	100	100	175	175	175	95	95	70
L4	55	55	75	75	130	130	130	55	55	60
L5	50	50	50	50	120	120	120	50	50	50

	Winter		Spring		Summer			Fall		
Pepacton	Dec 1 -	Apr 1 -	May 1 -	May 21 -	Jun 1 -	Jun 16 -	Jul 1 -	Sep 1 -	Sep 16 -	Oct 1 -
Storage Zone	31-Mar	30-Apr	20-May	31-May	15-Jun	30-Jun	31-Aug	15-Sep	30-Sep	30-Nov
L1-a	700	700	*	*	*	700	700	700	700	700
L1-b	185	*	*	*	*	*	250	200	200	185
L1-c	85	85	110	130	150	150	150	150	100	85
L2	65	65	100	125	140	140	140	140	85	60
L3	55	55	80	80	100	100	100	55	55	55
L4	45	45	50	50	85	85	85	40	40	40
L5	40	40	40	40	80	80	80	30	30	30

	Winter		Spring		Summer			Fall		
Neversink	Dec 1 -	Apr 1 -	May 1 -	May 21 -	Jun 1 -	Jun 16 -	Jul 1 -	Sep 1 -	Sep 16 -	Oct 1 -
Storage Zone	31-Mar	30-Apr	20-May	31-May	15-Jun	30-Jun	31-Aug	15-Sep	30-Sep	30-Nov
L1-a	190	190	*	*	*	190	190	190	190	190
L1-b	100	*	*	*	*	*	125	125	85	95
L1-c	65	65	85	100	110	110	110	110	75	60
L2	45	45	75	90	100	100	100	100	70	45
L3	40	40	50	50	75	75	75	40	40	40
L4	35	35	40	40	60	60	60	30	30	30
L5	30	30	30	30	55	55	55	25	25	25

*Storage zone does not apply during this period. Releases will be made in accordance with zone L1-c.

Table 3 (Continued)
Schedule Of Releases (cfs)
With 20 mgd Available

	Winter		Spring		Summer			Fall		
Cannonsville Storage Zone	Dec 1 - 31-Mar	Apr 1 - 30-Apr	May 1 - 20-May	May 21 - 31-May	Jun 1 - 15-Jun	Jun 16 - 30-Jun	Jul 1 - 31-Aug	Sep 1 - 15-Sep	Sep 16 - 30-Sep	Oct 1 - 30-Nov
L1-a	1500	1500	*	*	*	1500	1500	1500	1500	1500
L1-b	250	*	*	*	*	*	350	300	275	250
L1-c	110	110	200	250	275	275	275	275	140	110
L2	72	72	165	210	231	231	231	231	103	72
L3	63	63	90	90	158	158	158	86	86	63
L4	50	50	68	68	117	117	117	50	50	54
L5	45	45	45	45	108	108	108	45	45	45

	Winter		Spring		Summer			Fall		
Pepacton Storage Zone	Dec 1 - 31-Mar	Apr 1 - 30-Apr	May 1 - 20-May	May 21 - 31-May	Jun 1 - 15-Jun	Jun 16 - 30-Jun	Jul 1 - 31-Aug	Sep 1 - 15-Sep	Sep 16 - 30-Sep	Oct 1 - 30-Nov
L1-a	700	700	*	*	*	700	700	700	700	700
L1-b	185	*	*	*	*	*	250	200	200	185
L1-c	85	85	110	130	150	150	150	150	100	85
L2	58	58	90	113	124	124	124	124	76	54
L3	50	50	72	72	90	90	90	50	50	50
L4	41	41	45	45	77	77	77	36	36	36
L5	36	36	36	36	72	72	72	27	27	27

	Winter		Spring		Summer			Fall		
Neversink Storage Zone	Dec 1 - 31-Mar	Apr 1 - 30-Apr	May 1 - 20-May	May 21 - 31-May	Jun 1 - 15-Jun	Jun 16 - 30-Jun	Jul 1 - 31-Aug	Sep 1 - 15-Sep	Sep 16 - 30-Sep	Oct 1 - 30-Nov
L1-a	190	190	*	*	*	190	190	190	190	190
L1-b	100	*	*	*	*	*	125	125	85	95
L1-c	65	65	85	100	110	110	110	110	75	60
L2	40	40	65	80	90	90	90	90	63	40
L3	36	36	45	45	68	68	68	36	36	36
L4	32	32	36	36	54	54	54	27	27	27
L5	27	27	27	27	50	50	50	23	23	23

*Storage zone does not apply during this period. Releases will be made in accordance with zone L1-c.

Table 3 (Continued)
Schedule Of Releases (cfs)
With 10 mgd Available

	Winter		Spring		Summer			Fall		
Cannonsville Storage Zone	Dec 1 - 31-Mar	Apr 1 - 30-Apr	May 1 - 20-May	May 21 - 31-May	Jun 1 - 15-Jun	Jun 16 - 30-Jun	Jul 1 - 31-Aug	Sep 1 - 15-Sep	Sep 16 - 30-Sep	Oct 1 - 30-Nov
L1-a	1500	1500	*	*	*	1500	1500	1500	1500	1500
L1-b	250	*	*	*	*	*	350	300	275	250
L1-c	110	110	200	250	275	275	275	275	140	110
L2	65	65	154	194	212	212	212	212	94	65
L3	57	57	82	82	143	143	143	77	77	57
L4	45	45	61	61	106	106	106	45	45	49
L5	41	41	41	41	98	98	98	41	41	41

	Winter		Spring		Summer			Fall		
Pepacton Storage Zone	Dec 1 - 31-Mar	Apr 1 - 30-Apr	May 1 - 20-May	May 21 - 31-May	Jun 1 - 15-Jun	Jun 16 - 30-Jun	Jul 1 - 31-Aug	Sep 1 - 15-Sep	Sep 16 - 30-Sep	Oct 1 - 30-Nov
L1-a	700	700	*	*	*	700	700	700	700	700
L1-b	185	*	*	*	*	*	250	200	200	185
L1-c	85	85	110	130	150	150	150	150	100	85
L2	53	53	82	103	114	114	114	114	69	49
L3	45	45	65	65	82	82	82	45	45	45
L4	37	37	41	41	69	69	69	33	33	33
L5	33	33	33	33	65	65	65	24	24	24

	Winter		Spring		Summer			Fall		
Neversink Storage Zone	Dec 1 - 31-Mar	Apr 1 - 30-Apr	May 1 - 20-May	May 21 - 31-May	Jun 1 - 15-Jun	Jun 16 - 30-Jun	Jul 1 - 31-Aug	Sep 1 - 15-Sep	Sep 16 - 30-Sep	Oct 1 - 30-Nov
L1-a	190	190	*	*	*	190	190	190	190	190
L1-b	100	*	*	*	*	*	125	125	85	95
L1-c	65	65	85	100	110	110	110	110	75	60
L2	37	37	61	73	82	82	82	82	57	37
L3	33	33	41	41	61	61	61	33	33	33
L4	29	29	33	33	49	49	49	24	24	24
L5	24	24	24	24	45	45	45	20	20	20

*Storage zone does not apply during this period. Releases will be made in accordance with zone L1-c.

Table 3 (Continued)
Schedule Of Releases (cfs)
With 0 mgd Available

	Winter		Spring		Summer			Fall		
Cannonsville Storage Zone	Dec 1 - 31-Mar	Apr 1 - 30-Apr	May 1 - 20-May	May 21 - 31-May	Jun 1 - 15-Jun	Jun 16 - 30-Jun	Jul 1 - 31-Aug	Sep 1 - 15-Sep	Sep 16 - 30-Sep	Oct 1 - 30-Nov
L1-a	1500	1500	*	*	*	1500	1500	1500	1500	1500
L1-b	250	*	*	*	*	*	350	300	275	250
L1-c	110	110	200	250	275	275	275	275	140	110
L2	58	58	134	175	190	190	190	190	84	58
L3	51	51	73	73	128	128	128	69	69	51
L4	40	40	55	55	95	95	95	40	40	44
L5	37	37	37	37	88	88	88	37	37	37

	Winter		Spring		Summer			Fall		
Pepacton Storage Zone	Dec 1 - 31-Mar	Apr 1 - 30-Apr	May 1 - 20-May	May 21 - 31-May	Jun 1 - 15-Jun	Jun 16 - 30-Jun	Jul 1 - 31-Aug	Sep 1 - 15-Sep	Sep 16 - 30-Sep	Oct 1 - 30-Nov
L1-a	700	700	*	*	*	700	700	700	700	700
L1-b	185	*	*	*	*	*	250	200	200	185
L1-c	85	85	110	130	150	150	150	150	100	85
L2	47	47	73	91	102	102	102	102	62	44
L3	40	40	58	58	73	73	73	40	40	40
L4	33	33	37	37	62	62	62	29	29	29
L5	29	29	29	29	58	58	58	22	22	22

	Winter		Spring		Summer			Fall		
Neversink Storage Zone	Dec 1 - 31-Mar	Apr 1 - 30-Apr	May 1 - 20-May	May 21 - 31-May	Jun 1 - 15-Jun	Jun 16 - 30-Jun	Jul 1 - 31-Aug	Sep 1 - 15-Sep	Sep 16 - 30-Sep	Oct 1 - 30-Nov
L1-a	190	190	*	*	*	190	190	190	190	190
L1-b	100	*	*	*	*	*	125	125	85	95
L1-c	65	65	85	100	110	110	110	110	75	60
L2	33	33	55	66	73	73	73	73	51	33
L3	29	29	37	37	55	55	55	29	29	29
L4	26	26	29	29	44	44	44	22	22	22
L5	22	22	22	22	40	40	40	18	18	18

*Storage zone does not apply during this period. Releases will be made in accordance with zone L1-c.

Figure 1
New York City Delaware System Usable Combined Storage
(Cannonsville, Pepacton and Neversink Reservoirs)

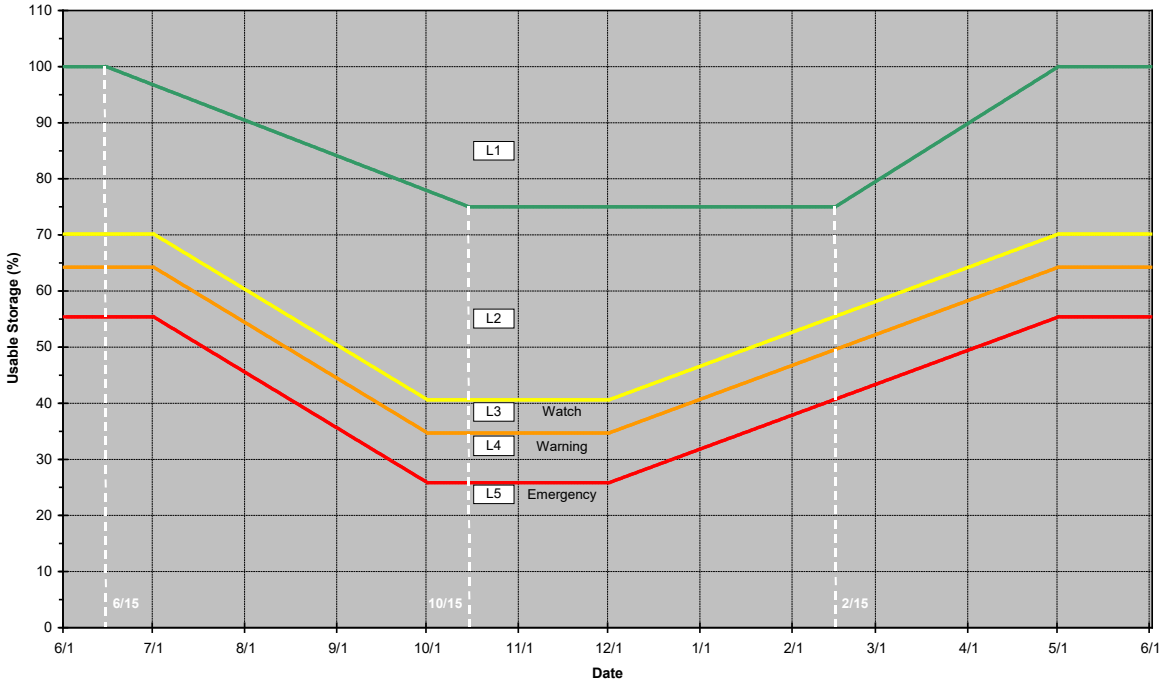
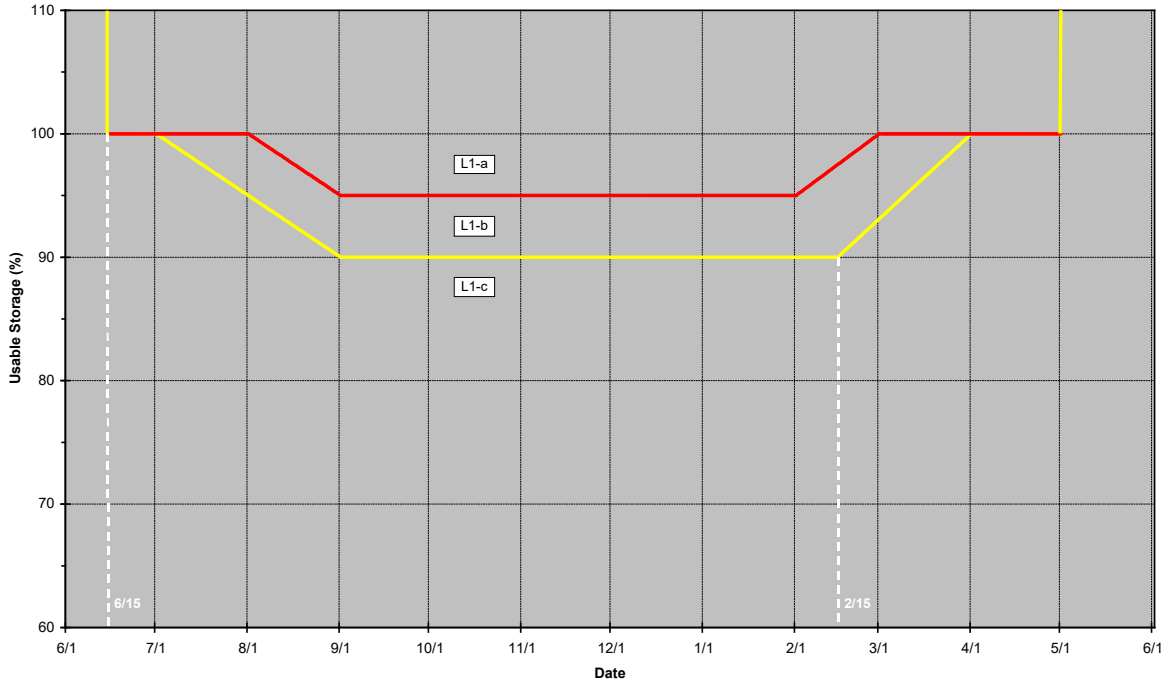


Figure 2
New York City Delaware System Usable Individual Storage
(Cannonsville, Pepacton and Neversink Reservoirs)



The City shall make discharge mitigation releases from the City Delaware Basin Reservoirs in accordance with the following:

i. For the period June 16 through April 30, if combined reservoir usable storage is in Zone L1 in accordance with Figure 1, discharge mitigation releases shall be made based upon individual reservoir usable storage in accordance with Zones L1-a, L1-b and L1-c as provided in Figure 2 and Table 3. During the period October 1 through April 30, fifty percent (50%) of the water equivalent of snow pack in the watersheds above the reservoirs shall be included in the determination of combined and individual reservoir usable storage in relation to Figures 1 and 2.

ii. For the period April 1 through April 30, if combined reservoir usable storage including snow pack is in excess of 100%, discharge mitigation releases shall be made based upon individual reservoir usable storage in accordance with Zone L1-a as provided in Figure 2 and Table 3.

iii. For the period May 1 through June 15, Zones L1-a and L1-b shall not be applicable in accordance with Figure 2, and discharge mitigation releases shall be made in accordance with Zone L1-c as provided in Figure 2 and Table 3.

iv. The NYCDEP and NYSDEC release managers may transfer spills to bottom releases to the extent possible and mutually agreed upon at any reservoir.

v. The current National Weather Service flood stage for the West Branch Delaware River at Hale Eddy is 11 feet. Accordingly, Zone L1discharge 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 discharge mitigation release, and releases shall be made in accordance with Zone L2 through L5 as provided in Table 3. This guidance may be modified at any time upon unanimous consent by the Decree Parties, if additional information demonstrates that a different cautionary stage should be used to limit the discharge mitigation releases.

vi. The current National Weather Service flood stage for the East Branch Delaware River at Fishs Eddy is 13.0 ft. Accordingly, Zone L1 discharge mitigation releases will not be made from Pepacton Reservoir when the river stage for the East Branch Delaware River at Fishs Eddy is above 11.0 ft. or is forecast to be above 11.0 ft. within 48 hours of a planned discharge mitigation release, and releases shall be made in accordance with Zone L2 through L5 as provided in Table 3. This guidance may be modified at any time upon unanimous consent by the Decree Parties, if additional information demonstrates that a different cautionary stage should be used to limit the discharge mitigation releases.

vii. The current National Weather Service flood stage for the Neversink River at Bridgeville is 13 feet. Accordingly, Zone L1 discharge 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 discharge mitigation release, and releases shall be made in accordance with Zone L2 through L5 as provided in Table 3. This guidance may be modified at any time upon unanimous consent by the Decree Parties, if additional information demonstrates that a different cautionary stage should be used to limit the discharge mitigation releases.

viii. Discharge 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.

ix. Discharge 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 in Table 4 below. Respective controlled releases will be reduced to L2 releases in Table 3, or lower.

x. To more naturally effect downward or upward transitions between discharge mitigation release rates identified in Table 3, discharge mitigation release rates may be ramped generally over a period not to exceed three days at Cannonsville and Pepacton Reservoirs or two days at Neversink Reservoir, but in increments no less than 10 cfs at any reservoir.

Table 4
Maximum Combined Discharge Rates

Reservoir	*Maximum Combined Discharge Rate (cfs)*
Neversink	3,400
Pepacton	2,400
Cannonsville	4,200

b. Sustainability

The sustainable source of water for releases in accordance with the THPDMP described herein is the possible construction of an additional 13 billion gallons of combined storage at the Cannonsville and Pepacton Reservoirs, the feasibility of which is being evaluated by NYS and the City. This possible additional storage will be constructed for the primary purpose of supporting a sustainable fisheries program. Prior to construction, the Decree Parties shall unanimously agree on any additional purposes for which such storage will be used. In addition, an operating plan covering filling and drawdown of the storage may be prepared, for consideration and unanimous approval by the Decree Parties. With this possible additional storage the releases in Table 3 with 35 MGD shall be applicable. Until such time as the construction of that additional storage is completed, but not later than December 31, 2012, unless a later date is agreed upon by the Decree Parties, an interim source of water for the THPDMP shall be provided from such unused portion of the New York City diversion allocation of 800 million gallons per day under Normal conditions as may be available from year to year and from such portion of the IERQ as may be approved for such use from year to year by all of the Downbasin Parties (DE, NJ and PA) as provided for below.

Each year, the City shall estimate and report to the River Master the anticipated quantity of unused allocation, not to exceed 35 mgd, from the City Delaware Basin Reservoirs for the ensuing year. Such estimated amount shall be available for use for the THPDMP.

In any year in which the City's estimated quantity of unused allocation is less than 35 mgd, the Downbasin Parties may determine and report to the River Master a quantity of the IERQ which may be made available for use for the THPDMP for that year, not to exceed the difference between 35 mgd and the quantity estimated by the City for that year. Such quantity shall be deducted from the IERQ.

In the event that less than 35 mgd combined is available from the City's unused allocation and the portion of the IERQ approved by the Downbasin Parties for this purpose, in any year, or if during any year, an unanticipated emergency renders unavailable a portion or all of the City's unused allocation or the IERQ, the THPDMP releases shall be determined in accordance with Table 3 based upon the quantity of water available. Subsequent to December 31, 2012, if the proposed additional storage is not completed, then releases shall be made in accordance with Table 3 for 0 MGD, unless otherwise agreed upon by the Decree Parties.

7. DISCHARGE MITIGATION

Discharge mitigation releases designed to reduce discharges from the City Delaware Basin Reservoirs during periods of high flow shall be made in quantities described in the THPDMP.

8. SALINITY REPULSION

The operating objective should be to limit salinity in the Delaware Estuary to a maximum 30-day average of 180 parts per million of chlorides and a maximum 30-day average of 100 parts per million of sodium at River Mile 98 (i.e., one mile upstream of the Walt Whitman Bridge), unless the salinity repulsion flows necessary for estuary and bay ecological health, as addressed in Section12, require a more stringent limit.

9. DWARF WEDGE MUSSELS

The Decree Parties and the DRBC agree to review and evaluate available data during the implementation of this FFMP and will consider any modifications that may be necessary to avoid taking, harming, or adverse effects on Dwarf Wedge Mussels.

10. LAKE WALLENPAUPACK

The Decree Parties and the DRBC agree to evaluate seasonal or snowpack-based discharge mitigation programs, as may be proposed by the operators of Lake Wallenpaupack, and consider any modifications to the Lake Wallenpaupack operations plan (Resolution 2002-33) that may be required to implement such programs, if found feasible.

11. RECREATIONAL BOATING

The Decree Parties and the DRBC agree to evaluate potential release programs, if proposed, for supporting whitewater boating activities and provide a report of potential alternatives and recommendations for such release programs, if found feasible.

12. ESTUARY AND BAY ECOLOGICAL HEALTH

The Decree Parties and the DRBC agree to review and evaluate available data during the implementation of this FFMP and will recommend modifications that may be necessary to maintain the ecological health of the Delaware Estuary and Bay including that of oysters, shellfish and endangered species. The focus of this FFMP element includes the Upper Delaware Estuary, Lower Delaware Estuary, and Delaware Bay, and such modifications shall be considered in accordance with the criteria described in Section 1.b.

13. WARM-WATER AND MIGRATORY FISH

The Decree Parties and the DRBC agree to review and evaluate available information on the effects of implementation of this FFMP on warm-water fishes that occur in the Delaware River and will consider any modifications to conserve native species of special concern and migratory species. Efforts will be made to improve the knowledge of the populations, habitats, and needs of these species to inform the adaptive management process.

14. MONITORING AND REPORTING

NYSDEC shall, on April 30 of each year, submit to the Decree Parties and to the DRBC annual status reports on the effectiveness of the THPDMP. Discussion of such reports shall be included as an agenda item at annual meetings of the Delaware River Master Advisory Committee.

NYSDEC shall conduct a biological monitoring program in 2009 and thereafter, once every five years, in accordance with the NYSDEC "Monitoring Plan for the Delaware River Tailwaters."

By March 31, 2011, and every 5 years thereafter, NYSDEC shall submit to the Decree Parties and to the DRBC a scientific report describing the effects on the fishery and other aquatic resources resulting from implementation of the THPDMP. Such report shall include an abstract or executive summary, statements of purpose, scope and objectives, procedures, results, conclusions, recommendations for additional work if warranted, and supporting literature, and shall describe effects on the fishery and other aquatic resources resulting from implementation of the THPDMP.

By April 30, 2009 and every two years thereafter, NYSDEC and the City shall submit to the Decree Parties and to the DRBC a status report on the effort by New York State to secure funding and implement the construction of additional storage in the City's Delaware Basin Reservoirs. Such reports shall discuss potential alternative funding sources and include an estimated phased construction schedule for such work and projected completion dates.

15. REASSESSMENT STUDY

In accordance with Section VIII of the "Recommendations of the Parties to the U.S. Supreme Court Decree of 1954 to the Delaware River Basin Commission Pursuant to Commission Resolution 78-20 (with appendices), known as the "Good Faith" agreement" of 1983, whereby the Decree Parties agreed that in consultation with the DRBC, they would periodically review

the "Good Faith" agreement and recommend such adjustments or modifications thereto as might be required to respond to changing conditions, the Decree Parties hereby agree to conduct a comprehensive reassessment (Reassessment Study) of the safe yield (to the extent described in this Section) and operations of selected Basin reservoirs and the Delaware and Raritan Canal, including a reassessment of the Montague and Trenton flow objectives, as well as complete detachment of the salt front vernier.

The objectives of the Reassessment Study will be: (a) to identify current issues and concerns related to continued operations under the 1983 Good Faith Agreement; (b) to identify alternatives for Basin reservoir operations (NYC and non-NYC impoundments), to optimize the system of usage of waters of the Basin for water supply management under routine and drought conditions and for flood mitigation, fisheries management, and overall ecological protection of the River system, while maintaining Decree Party equity established by the Decree; and (c) to establish recommendations for improved water management planning in the Basin. All of the Decree Parties agree to provide information on current and contemplated use of Basin water.

The Reassessment Study shall also include evaluation of the components used in the calculation of the ERQ as defined in the Decree. NYCDEP will calculate the safe yield of the City Water Supply System based on the most current information available and will calculate the expected annual consumption of the City Water Supply System. The safe yield calculation and its supporting data will be provided by the NYCDEP for purposes of analyses called for in this Agreement. NYCDEP recognizes that this information may be utilized for analyses outside of the scope of this Agreement; such analyses shall not be used or relied upon in connection with the Reassessment Study. The Reassessment Study to be conducted pursuant to this Agreement shall not revise or test other assumptions for the safe yield of New York City's water supply system.

The Reassessment Study should reflect yield and operations based upon existing infrastructure, and should consider opportunities for additional storage, including water storage purchases, infrastructure enhancements, treatment upgrades, water conservation and water reuse. The Reassessment Study also should include a comprehensive review of the current rule curves and the drought recovery criteria as it relates to the resumption of normal diversions, Montague and Trenton flow objectives and conservation releases. However, nothing in this Agreement shall be construed as amending or expressing an intention to amend the existing rights of the Decree Parties contained in the Decree to diversions and releases to meet flow objectives. For each recommendation identified, the associated opportunities/benefits and challenges/detriments should be described. The Reassessment Study should be closely coordinated with activities undertaken in connection with the DRBC Flood Mitigation Task Force Action Plan.

The Decree Parties agree to provide funds to the DRBC to engage an independent contractor to conduct the Reassessment Study, the cost of which shall be equitably shared by the Decree Parties. DRBC shall solicit qualified consultants utilizing a request for proposals (RFP) process. The DRBC Executive Director shall convene a Reassessment Steering Committee, consisting of a representative from each of the Decree Parties and the Federal Government, which shall direct the scope and conduct of the Reassessment Study. The RFP to be utilized in soliciting bids from qualified consultants, including the scope of services, shall be subject to the review and unanimous approval of the Decree Parties, as shall the selection of the consultant chosen to undertake the Study. Final products of the Reassessment Study are expected within the three-year time frame of this FFMP, but a firm estimate of cost and timeline will be solicited as part of the RFP process.

DRBC and the Decree Parties will provide the contractor with access to all data required for the Reassessment Study. These data shall include but shall not be limited to storage criteria, safety factors, per capita use, seasonal demand patterns, physical limitations on conveyance, secondary augmentation storage, population served, projected demands, reductions in water demand as a result of water conservation efforts or water reuse, expenditures on water conservation measures, the investigation and construction of additional storage, or the purchase of supplemental water sources, and current and expected peak day, peak month, and annual average and conjunctive use constraints, such as water quality and storage levels. Data or information that are sensitive from a security standpoint may be withheld by any Decree Party, unless arrangements acceptable to such Decree Party are put in place to protect the confidentiality of such data or information. The final report shall not include any such sensitive information unless consented to by the Decree Party providing same.

If consensus is reached based on the findings of this Reassessment Study, it is the intention of the Decree Parties to consider and potentially to adopt revisions to operating procedures, revisions to laws and regulations, or other changes to policies or procedures as may be necessary to implement such findings. Where appropriate, such revisions or changes may be incorporated into rules and/or dockets established by the DRBC following public notice and a hearing.

16. PERIODIC EVALUATION AND REVISION

In order to support an adaptive management process and to improve over time the scientific basis for the various elements of the FFMP, periodic evaluation of the elements shall be required of the appropriate Decree Parties or DRBC. Such evaluations shall be conducted in accordance with evaluation plans approved by the Decree Parties and DRBC. Components of the evaluation plans shall include: evaluation need(s), purpose and scope, objectives, approach and methods, evaluation benefits, content of planned reports, evaluation schedule, personnel needs, budget, source of funds and, where appropriate, results of previous investigations.

The Decree Parties and the DRBC shall, at the conclusion of the DRBC rulemaking process, consider whether any revisions to the FFMP should be made on the basis of the public comments received. In addition, the Decree Parties and the DRBC shall annually evaluate the results of the FFMP, relative to the purposes described in Section 1.a and other water uses and considerations as may be deemed appropriate, including consideration of any evaluations that have been completed within the previous year and input from the public. The Decree Parties agree that during the entire effective period of this Agreement, as monitoring, reporting and evaluation may show to be appropriate, the provisions of this agreement specifying triggers for and quantities of releases may be revised through an adaptive management process to further enhance the overall natural resource and economic benefits derived from the releases from the City Delaware Basin Reservoirs. Any resultant action taken shall be subject to the unanimous approval of the Decree Parties.

17. TEMPORARY SUSPENSION OR MODIFICATION

From time to time, the Decree Parties and DRBC may agree that emergencies, maintenance and repair operations, short-term needs, or unanticipated effects of the FFMP may require temporary suspension or modification of one or more of the provisions herein. In considering such temporary suspensions

or modifications, the Decree Parties and DRBC may estimate probabilities and risks associated with the temporary suspensions or modifications. Any resultant action taken, other than modifications to the releases as provided below, shall be subject to the unanimous approval of the Decree Parties.

The City shall establish the scope of work and the work schedule for maintenance and repair operations and shall provide such information to the Decree Parties and DRBC as early as practicable. In the absence of unanimous approval of a modified release schedule as may be required for purposes of necessary maintenance and repair, the City, acting in cooperation with the NYSDEC, will make releases to the best of its ability for the duration of the maintenance or repair work, provided, however, that releases shall be sufficient to meet the Montague flow objective in effect at the time.

Modifications to releases not to exceed seven consecutive days for purposes of maintenance or repair of immediate necessity, or modifications to avoid unreasonable sub-daily fluctuations in releases, shall not require Decree Party approval, but shall be done in cooperation with NYSDEC, provided, however, that releases shall be sufficient to meet the Montague flow objective in effect at the time.

18. RESERVATIONS

Nothing contained herein shall be deemed to constitute a waiver or modification of, or limitation on, NYC's right to divert up to an average of 800 mgd, combined, out of the basin from the City Delaware Basin Reservoirs or New Jersey's right to divert up to an average of 100 mgd out of the basin, or the Lower Basin Parties' right to releases from the City Delaware Basin Reservoirs sufficient to maintain the 1,750-cfs Montague flow objective, consistent with the terms of the Decree. This Agreement shall not be cited as precedent of any intention to waive or modify or limit the above-cited rights. Notwithstanding this reservation of rights, the Decree Parties intend to be legally bound by the terms and conditions of this Agreement.

The Decree Parties and DRBC have authorized certain actions, including but not limited to discharge mitigation releases, in this Agreement to assist in mitigating the impacts of flooding immediately below the NYC Delaware Basin Reservoirs. By incorporating flood mitigation as an objective and taking the actions provided herein, the Decree Parties and DRBC do not create or assume any duties or obligations regarding flood mitigation or in any way modify any such duties or obligations that may be otherwise prescribed by law.

19. EFFECTIVE DATE

This Agreement shall take effect upon unanimous consent of the Decree Parties and shall expire on May 31, 2011, unless renewed as provided for in Section 20 or the expiration date is revised.

20. RENEWAL AND REVISION

This Agreement may be revised only through the unanimous written agreement of the Decree Parties. The Decree Parties agree to consider the results of the Reassessment identified in Section 15, including possible changes to the Drought Operations Plan as defined under the "Good Faith Agreement" and

modified herein, as they become available. Revisions to the Drought Operations Plan based upon such reassessment, may be incorporated into this Agreement through the unanimous approval of the Decree Parties. This Agreement, and any unanimously agreed to revisions, may be renewed for an additional 5-year period beginning June1, 2011 by unanimous written agreement of all the Decree Parties and adoption by DRBC prior to May 31, 2011. If renewed for such additional 5-year period, the Agreement shall thereafter automatically renew in five-year increments, unless terminated as provided for in Section 21. If this Agreement is not renewed for the additional 5-year period, prior to May 31, 2011, the Decree Parties agree to enter into good faith negotiations to determine a course of action in the absence of such renewal.

21. TERMINATION and REVERSION

Any Decree Party may terminate the Agreement on any automatic renewal date, commencing with the June 1, 2016 renewal date, by providing notice to the other Decree Parties, no less than 180 days prior to such renewal date, of its intent to terminate the agreement on such renewal date. If timely notice of intent to terminate is given, the Decree Parties agree to enter into good faith negotiations to determine a course of action in the absence of such renewal. Upon any failure by all Decree Parties to continue this Agreement, and any revisions to this Agreement, in accordance with Section 20, in effect either on June 1, 2011 or any renewal period thereafter, and in the absence of agreement upon a course of action as provided in Section 20 and this section, operations shall revert to those provided in Docket D-77-20 CP (Revised). The Decree Parties agree to use their best efforts to develop by June 1, 2011 appropriate amelioration for fisheries habitat protection in accordance with Article 3 of Resolution 2002-33 (the new PPL Drought Management Plan), to be applied in conjunction with such operations.

In determining the course of action as provided above, the Decree Parties also agree to consider means by which the provisions of Tables 1 and 2, related to the NJ Diversion and the City detachment from the salt front vernier, can be continued under such course of action while preserving the Downbasin Parties' interests.

22. RESCISSION AND NULLIFICATION

The Parties recommend that the DRBC rescind Resolutions and Dockets D-77-20 CP (Revision 2) through D-77-20 CP (Revision 10), to the extent each has not already expired. This Agreement shall be null and void, and of no further force and effect, if such recissions are not effected.

STATE OF DELAWARE

The State of Delaware hereby approves this Agreement of the Parties to the U.S. Supreme Court Decree of 1954 for a Flexible Flow Management Program and recommends that this Agreement be submitted to the Delaware River Basin Commission for implementation as appropriate through rules, dockets and/ or resolutions, subject in each instance to the further agreement of the Parties as required by Section 3.3(a) of the Delaware River Basin Compact.

_____

STATE OF NEW JERSEY

The State of New Jersey hereby approves this Agreement of the Parties to the U.S. Supreme Court Decree of 1954 for a Flexible Flow Management Program and recommends that this Agreement be submitted to the Delaware River Basin Commission for implementation as appropriate through rules, dockets and/ or resolutions, subject in each instance to the further agreement of the Parties as required by Section 3.3(a) of the Delaware River Basin Compact.

_____

CITY OF NEW YORK

The City of New York hereby approves this Agreement of the Parties to the U.S. Supreme Court Decree of 1954 for a Flexible Flow Management Program and recommends that this Agreement be submitted to the Delaware River Basin Commission for implementation as appropriate through rules, dockets and/ or resolutions, subject in each instance to the further agreement of the Parties as required by Section 3.3(a) of the Delaware River Basin Compact.

_____

STATE OF NEW YORK

The State of New York hereby approves this Agreement of the Parties to the U.S. Supreme Court Decree of 1954 for a Flexible Flow Management Program and recommends that this Agreement be submitted to the Delaware River Basin Commission for implementation as appropriate through rules, dockets and/ or resolutions, subject in each instance to the further agreement of the Parties as required by Section 3.3(a) of the Delaware River Basin Compact.

_____

COMMONWEALTH OF PENNSYLVANIA

The Commonwealth of Pennsylvania hereby approves this Agreement of the Parties to the U.S. Supreme Court Decree of 1954 for a Flexible Flow Management Program and recommends that this Agreement be submitted to the Delaware River Basin Commission for implementation as appropriate through rules, dockets and/ or resolutions, subject in each instance to the further agreement of the Parties as required by Section 3.3(a) of the Delaware River Basin Compact.

_____

Appendix 3. Temporary IERQ Extraordinary Needs Bank Releases Program for Summer 2010

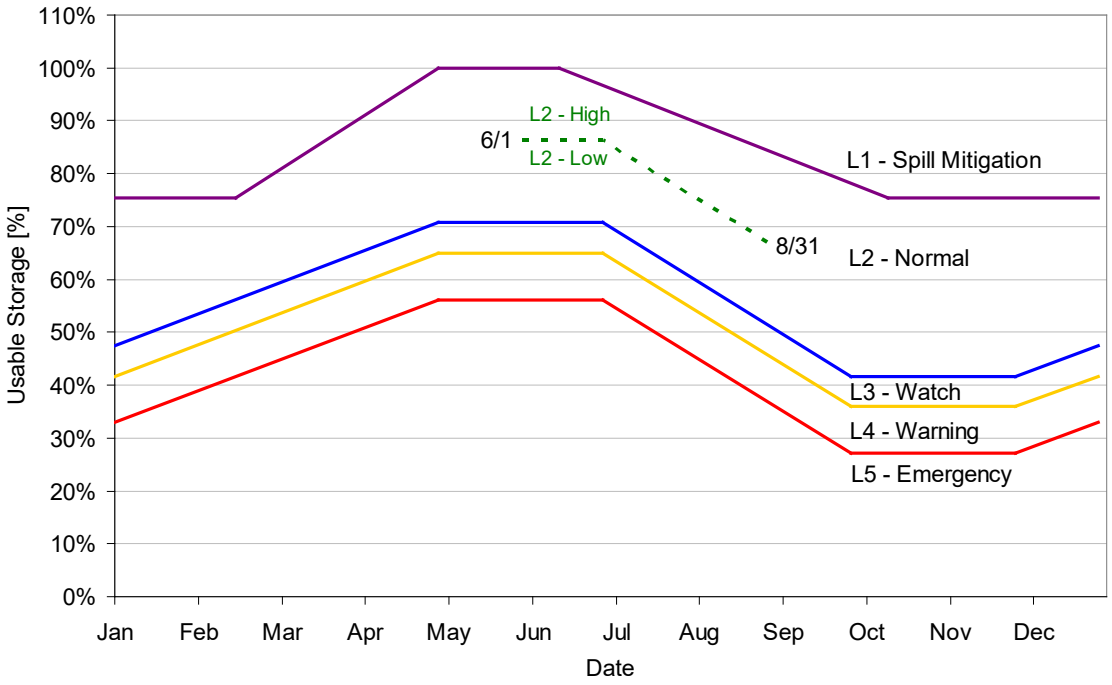
AGREEMENT
Temporary
IERQ Extraordinary Needs Bank
Releases Program for Summer 2010

In order to more effectively use the 2010 Interim Excess Release Quantity (IERQ) water, the Decree Parties, in accordance with Section 4.d of the Flexible Flow Management Program, hereby agree to the following, for the period beginning June 1, 2010 and ending May 31, 2011:

1. The Montague Flow Objective shall remain at 1,750 cfs, and the 9,300 cfs-days of water otherwise devoted to the 100-cfs summertime increment of the Montague Flow Objective shall be debited from the Interim Excess Release Quantity and designated as an Interim Excess Release Quantity Extraordinary Needs Bank and used in accordance with Paragraphs 2 through 4 hereof.
2. Figure 1 shall be revised as attached, to divide the L2 storage zone into two subzones for a portion of the year. The L2 Storage Zone in Figure 1 shall be divided into two subzones for the period beginning June 1 and ending August 31, by a line 43 billion gallons above the L2 (Drought Watch) line. The subzone above the line shall be denoted L2 High, and the subzone below the line shall be denoted L2 Low.
3. A quantity of 6,045 cfs-days of water shall be debited from the Interim Excess Release Quantity Extraordinary Needs Bank, and Table 3 Schedule of Releases With 35 mgd Available shall be temporarily revised as attached, to provide for 2010 increased summertime releases from Cannonsville Reservoir as follows:
   a. For the period June 1 through June 15:
      i. releases shall be 325 cfs when storage is in Zones L1 and L2 High; and
      ii. releases shall be 300 cfs when storage is in Zone L2 Low.
   b. For the period June 16 through June 30:
      i. releases shall be 325 cfs when storage is in Zones L1-b, L1-c and L2 High; and
      ii. releases shall be 300 cfs when storage is in Zone L2 Low.
   c. For the period July 1 through August 31:
      i. releases shall be 325 cfs when storage is in Zones L1-c and L2 High; and
      ii. releases shall be 300 cfs when storage is in Zone L2 Low.
4. A quantity of 3,255 cfs-days of water shall be retained in the Interim Excess Release Quantity Extraordinary Needs Bank for such purposes as may be approved in accordance with Section 4.d of the Flexible Flow Management Program.

APPROVALS:

State of Delaware	Date	State of Delaware	Date
State of New Jersey	Date	State of New York	Date
Commonwealth of Pennsylvania	Date	City of New York	Date



Revised FFMP Figure 1 -- New York City Delaware System Usable Combined Storage Zones for Temporary IERQ Extraordinary Needs Bank Releases Program for Summer 2010 (Cannonsville, Pepacton, and Neversink Reservoirs)

Revised FFMP Table 3 -- Schedule of Releases (cfs) with 35 mgd Available for the Temporary IERQ Extraordinary Needs Bank Releases Program for Summer 2010 (Cannonsville, Pepacton, and Neversink Reservoirs)

	Winter		Spring		Summer			Fall		
Cannonsville Storage Zone	Dec 1 - 31-Mar	Apr 1 - 30-Apr	May 1 - 20-May	May 21 - 31-May	Jun 1 - 15-Jun	Jun 16 - 30-Jun	Jul 1 - 31-Aug	Sep 1 - 15-Sep	Sep 16 - 30-Sep	Oct 1 - 30-Nov
L1-a	1500	1500	*	*	*	1500	1500	1500	1500	1500
L1-b	250	*	*	*	*	*	350	275	275	250
L1-c	110	110	200	250	325/~~275~~	325/~~275~~	325/~~275~~	275	140	110
L2-High	80	80	190	240	325/~~260~~	325/~~260~~	325/~~260~~	260	115	80
L2-Low	80	80	190	240	300/~~260~~	300/~~260~~	300/~~260~~	260	115	80
L3	70	70	100	100	175	175	175	95	95	70
L4	55	55	75	75	130	130	130	55	55	60
L5	50	50	50	50	120	120	120	50	50	50

	Winter		Spring		Summer			Fall		
Pepacton Storage Zone	Dec 1 - 31-Mar	Apr 1 - 30-Apr	May 1 - 20-May	May 21 - 31-May	Jun 1 - 15-Jun	Jun 16 - 30-Jun	Jul 1 - 31-Aug	Sep 1 - 15-Sep	Sep 16 - 30-Sep	Oct 1 - 30-Nov
L1-a	700	700	*	*	*	700	700	700	700	700
L1-b	185	*	*	*	*	*	250	200	200	185
L1-c	85	85	110	130	150	150	150	150	100	85
L2-H/L	65	65	100	125	140	140	140	140	85	60
L3	55	55	80	80	100	100	100	55	55	55
L4	45	45	50	50	85	85	85	40	40	40
L5	40	40	40	40	80	80	80	30	30	30

	Winter		Spring		Summer			Fall		
Neversink Storage Zone	Dec 1 - 31-Mar	Apr 1 - 30-Apr	May 1 - 20-May	May 21 - 31-May	Jun 1 - 15-Jun	Jun 16 - 30-Jun	Jul 1 - 31-Aug	Sep 1 - 15-Sep	Sep 16 - 30-Sep	Oct 1 - 30-Nov
L1-a	190	190	*	*	*	190	190	190	190	190
L1-b	100	*	*	*	*	*	125	125	85	95
L1-c	65	65	85	100	110	110	110	110	75	60
L2-H/L	45	45	75	90	100	100	100	100	70	45
L3	40	40	50	50	75	75	75	40	40	40
L4	35	35	40	40	60	60	60	30	30	30
L5	30	30	30	30	55	55	55	25	25	25

Appendix 4. Temporary Thermal Releases Program for Fishery Protection

AGREEMENT

Temporary Thermal Releases Program
For Fishery Protection

Persistently high air temperatures in the upper Delaware River Basin in early July 2010 resulted in elevated water temperatures in the mainstem Delaware River downstream of the New York City Delaware Basin reservoirs. In response to these thermal stress conditions, on July 6, 2010, the New York State Department of Environmental Conservation (NYSDEC) requested the approval of the Decree Parties to implement a temporary program of emergency releases from Cannonsville Reservoir to prevent additional thermal stress on the aquatic habitat in the upper mainstem.

On July 6, 2010, the Decree Parties agreed by electronic mail that during the period from July 6-9, 2010, emergency thermal releases would be made from Cannonsville Reservoir in accordance with the following schedule:

3. If the River Master directed release calculation to maintain the flow objective at Montague, NJ would results in a Cannonsville release equal to or greater than 525 cubic feet per second (cfs), then no emergency thermal release will be made.
4. If the River Master directed release calculation to maintain the flow objective at Montague, NJ would result in a Cannonsville release less that 525 cfs, then an emergency thermal release shall be made Cannonsville Reservoir such that the emergency releases and the directed release totals 525 cfs. The additional water required to make the emergency thermal release shall be debited from the IERQ Extraordinary Needs Bank described in the Summertime Releases Agreement effective May 27, 2010.
5. The total quantity of water debited from the IERQ Extraordinary Needs Bank under this agreement shall not exceed 600 cfs-days.

State of Delaware	Date	State of Delaware	Date
State of New Jersey	Date	State of New York	Date
Commonwealth of Pennsylvania	Date	City of New York	Date

Appendix 5. Consent to Action by the Delaware River Master Amendment Number 1

Consent to Action by The Delaware River Master
Amendment Number 1

Consent of the Parties to the U.S. Supreme Court Decree in New Jersey v. New York, 347 U.S. 995 (1954), approving the restoration, to the 2010 Interim Excess Release Quantity, of 2,823 cfs-days of unused water from the expired Temporary IERQ Extraordinary Needs Bank Summer Releases Program for 2010.

_____	_____
State of Delaware Date	State of Delaware Date
_____	_____
State of New Jersey Date	State of New York Date
_____	_____
Commonwealth of Pennsylvania Date	City of New York Date

Appendix 6. Temporary Supplemental Releases Program for Tentative 2009 Rondout West Branch Tunnel Shutdown

Temporary Supplemental Releases Program For Tentative 2009 Rondout West Branch Tunnel Shutdown

In order to perform necessary dive work on a dewatering shaft, the Rondout to West Branch Tunnel (RWBT) is tentatively scheduled to be shut down in the fall of 2009. A final decision has not yet been made on when this work will take place. Once the decision is made to perform the work, the RWBT will be shut down for the minimum period of time required to perform this critical work. In accordance with Section 17 of the Flexible Flow Management Program (FFMP), the New York City Department of Environmental Protection is herein authorized to implement a temporary supplemental releases program for the period ending May 31, 2010.

Shutdown supplemental releases will be made in accordance with Table 1 below and FFMP Table 3 with 35 mgd available and FFMP Figures 1 and 2.

Using a National Weather Service product, the Advanced Hydrologic Prediction Service (AHPS) long-term probabilistic reservoir inflow forecasts, NYCDEP will identify the hydrologic regime expected in the coming months. The conditional (not historical) simulation will be used to better simulate current and expected future hydrometeorological conditions. Based on best professional judgment and to adequately protect water supply, while not being overly cautious, the probability level 0.7 or “70%” forecast will be used. The AHPS forecast will be compared to DEP’s historical inflow data and categorized into very dry (only 10% of historical flows are this low or lower), dry (25%), normal (50%), and wet (75%). NYCDEP will select the category of historical inflow data that conservatively matches the forecast and evaluate operational requirements. Based upon that selection and evaluation, NYCDEP will determine the water supply condition for each reservoir. Acting in cooperation with the NYSDEC, NYCDEP will determine a shutdown supplementary release quantity from Table 1 below for the Cannonsville and Pepacton reservoirs. Shutdown supplemental release quantities from each reservoir will be determined individually, based upon each reservoir’s water supply condition. This will be the amount of supplemental water that can be released each day, over and above any other programmed releases (e.g. as specified in the FFMP). The shutdown supplementary release quantity will be added to any L1-b, L1-c, or L2 release amounts which may be in effect at the time, in Table 3 of the FFMP. The shutdown supplementary release quantity will not be added to any L1-a, L3, L4 or L5 releases which may be in effect.

Table 1
Shutdown Supplementary Release Quantity (cfs)

Reservoir Water Supply Condition	Cannonsville	Pepacton
C1	220	60
C2	125	20
C3	60	*
C4	*	*

* No shutdown supplementary release beyond FFMP Table 3.

Under this program, cumulative supplementary water released, beyond that which would have ordinarily been released under the FFMP, will range between 0 and 50 billion gallons, depending upon the water supply condition of the two reservoirs over the term of the program. If both reservoirs remain in excellent water supply condition (C1), the total supplementary releases will be approximately 50 billion gallons, substantially exceeding the estimated water not diverted during the shutdown.

Release levels will be reevaluated, generally on a weekly basis, in conjunction with the issuance of updated AHPS probabilistic forecasts.

Authorization under this temporary supplemental releases program shall become effective September 1, 2009 and shall continue until May 31, 2010 unless by unanimous agreement prior to that date the Parties approve a modification, suspension or earlier termination, as conditions may dictate. In the event the RWBT shutdown does not occur, termination of this program by the NYCDEP would not require approval of the other Parties.

_____ _____

City of New York Date State of New York Date

_____ _____

State of Delaware Date State of Delaware Date

_____ _____

Commonwealth of Pennsylvania Date State of New Jersey Date

Appendix 7. Temporary Supplemental Releases Program for Tentative 2010 Rondout West Branch Tunnel Shutdown

AGREEMENT

Temporary Supplemental Releases Program For Tentative 2010 Rondout West Branch Tunnel Shutdown

In order to perform necessary work on a dewatering shaft, the Rondout to West Branch Tunnel (RWBT) is tentatively scheduled to be shut down in the fall of 2010. A final decision has not yet been made on when this work will take place. Once the decision is made to perform the work, the RWBT will be shut down for the minimum period of time required to perform this critical work. In accordance with Section 17 of the Flexible Flow Management Program (FFMP), the New York City Department of Environmental Protection is herein authorized to implement a temporary supplemental releases program for the period ending May 31, 2011.

Shutdown supplemental releases will be made in accordance with Table 1 below and FFMP Table 3 with 35 mgd available and FFMP Figures 1 and 2.

Using a National Weather Service product, the Advanced Hydrologic Prediction Service (AHPS) long-term probabilistic reservoir inflow forecasts, NYCDEP will identify the hydrologic regime expected in the coming months. The conditional (not historical) simulation will be used to better simulate current and expected future hydrometeorological conditions. Based on best professional judgment and to adequately protect water supply, while not being overly cautious, the probability level 0.7 or "70%" forecast will be used. The AHPS forecast will be compared to DEP's historical inflow data and categorized into very dry (only 10% of historical flows are this low or lower), dry (25%), normal (50%), and wet (75%). NYCDEP will select the category of historical inflow data that conservatively matches the forecast and evaluate operational requirements. Based upon that selection and evaluation, NYCDEP will determine the water supply condition for each reservoir. Acting in cooperation with the NYSDEC, NYCDEP will determine a shutdown supplementary release quantity from Table 1 below for the Cannonsville, Pepacton and Neversink reservoirs. Shutdown supplemental release quantities from each reservoir will be determined individually, based upon each reservoir's water supply condition. This will be the amount of supplemental water that can be released each day, over and above any other programmed releases (e.g. as specified in the FFMP). The shutdown supplementary release quantity will be added to any L1-b, L1-c, or L2 release amounts which may be in effect at the time, in Table 3 of the FFMP. The shutdown supplementary release quantity will not be added to any L1-a, L3, L4 or L5 releases which may be in effect.

The City of New York is currently developing an Operational Support Tool (OST), a state-of-the-art decision support system for the NYC water supply system. OST will integrate current system data with inflow forecast data and system operating rules to project the likely range of reservoir levels and water quality over the coming weeks and months. As OST components become available the NYCDEP will transition from the manual procedure above to OST.

Table 1
Shutdown Supplementary Release Quantity (cfs)

Reservoir Water Supply Condition	Cannonsville	Pepacton	Neversink
C1	90	40	20
C2	50	20	10
C3	40	*	*
C4	*	*	*

* No shutdown supplementary release.

Under this program the cumulative supplementary water released, beyond that which would have ordinarily been released under the FFMP and other potential temporary programs will range between 0 and 35 billion gallons depending upon the water supply condition of the reservoirs over the term of the program. Release levels will be reevaluated, generally on a weekly basis, in conjunction with the issuance of updated AHPS probabilistic forecasts.

Authorization under this temporary supplemental releases program shall become effective June 1, 2010 and shall continue until May 31, 2011 unless by unanimous agreement prior to that date the Parties approve a modification, suspension or earlier termination, as conditions may dictate. In the event the RWBT shutdown does not occur, termination of this program by the NYCDEP would not require approval of the other Parties.

_____
City of New York Date

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State of New York Date

_____
State of Delaware Date

_____
State of Delaware Date

_____
Commonwealth of Pennsylvania Date

_____
State of New Jersey Date

USGS

Russell and others—**Report of the River Master of the Delaware River for the Period December 1, 2009–November 30, 2010**—Open-File Report 2019–1093

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