

HISTORY OF THE RESERVOIR RELEASES PROGRAM IN THE UPPER DELAWARE RIVER BASIN

Since the mid-1970s the Parties to the 1954 Supreme Court Decree, working in conjunction with the Delaware River Basin Commission (DRBC), have enacted a series of programs aimed at improving ecological conditions below the New York City Delaware Basin reservoirs. These programs have been adopted with the unanimous agreement of the Decree Parties—the States of Delaware, New Jersey, New York, and Pennsylvania, and the City of New York—and the Commission, consisting of the four states and the federal government. The primary goal of the programs for many years was to improve cold-water fishery conditions in the upper basin, while recognizing the diversions to New York City (NYC) and New Jersey (NJ) authorized by the Decree, the maintenance of lower basin minimum flows required by the Decree and the constraints imposed by limited reservoir storage, particularly during drought. Although enhancement and protection of the cold-water fishery remains a key focus, in recent years, the Decree Parties have expanded the program goals to include protection of federally-listed endangered species, the dwarf wedgemussel, and improved understanding and protection of ecological flow requirements in the main stem Delaware River, including the Estuary and Bay. The following provides background and a summary of the programs.

Background

Geographic Setting

The Catskill Mountain region of the upper Delaware River Basin is approximately 100 miles from the NYC metropolitan area. The Catskill drainage provides a high quality source of water, and NYC obtains nearly half of its municipal water supply from its three Delaware Basin reservoirs--Cannonsville, Pepacton, and Neversink. The headwaters of the Delaware River drain to New York State, Pennsylvania, New Jersey, and Delaware. Within the basin, the river supplies drinking water to much of the Philadelphia metropolitan area and major portions of New Jersey. In addition, water is diverted from the basin to both NYC and NJ. For the river's entire length, from its headwaters in New York to the Delaware Estuary and Bay, the Delaware also serves as an ecological and recreational resource. Over the past half century, as a result of the maintenance of lower basin minimum flows, cold-water fisheries have been established in the tailwaters of the East Branch Delaware, West Branch Delaware, and Neversink rivers and the upper main stem Delaware River, and most of the main stem upstream of Trenton, NJ has been designated by Congress as part of the federal Wild and Scenic Rivers system.

Supreme Court Decree

On May 4, 1931, the U. S. Supreme Court issued a decree authorizing NYC to divert an average of up to 440 million gallons of water per day (mgd) from two reservoirs it proposed to construct in the Delaware River Basin (the basin) for its water supply system in the Hudson River Basin (*Ref. 1*). This decree temporarily settled the case of the *State of New Jersey v. the State of New York and New York City*, 283 U.S. 336 (1931), and resolved an interstate dispute over NYC's diversion of water from the basin. The Decree required that NYC release sufficient water from its Delaware Basin reservoirs to maintain specified flow targets in the Delaware River at both Port Jervis, NY and Trenton, NJ.

The 1931 decree was amended and superseded by the Supreme Court on June 7, 1954 in *New Jersey v. New York*, 347 U.S. 995 (1954) ([Ref. 2](#)) when NYC proposed to construct a third reservoir. The amended Decree increased NYC's allowable diversion to an average of 800 mgd from all three Delaware Basin reservoirs, on condition that NYC release sufficient water from the reservoirs to maintain a minimum basic flow rate of 1,750 cubic feet per second (cfs) in the Delaware River at Montague, NJ. In addition, the 1954 amended Decree authorized New Jersey to continue its existing diversion of up to an average of 100 mgd from the basin without providing compensating releases.

Delaware River Master

The Decree established the Chief Hydraulic Engineer of the U.S. Geological Survey (USGS), or that official's designee, as the Delaware River Master (River Master) ([Ref. 2](#)). The [River Master's duties](#) include ensuring that the provisions of the 1954 Decree are met ([Ref. 3](#)). The daily operations of the River Master are conducted by the Deputy River Master through a USGS field office in Milford, PA. The annual River Master report to the Supreme Court provides a detailed daily accounting of all diversions, flows and directed releases, demonstrating compliance with the Decree requirements ([Ref. 4](#)). The 1954 Decree specifies that the River Master is to conserve the basin's waters in carrying out the duties for administration of the Decree. The River Master's performance of these duties has included communicating with upstream hydropower generators to determine their release schedules in addition to coordinating with NYC. It has also included technical assistance to and coordination with the Delaware River Basin Commission (DRBC) in its reservoir operations activities and with the River Master's Advisory Committee, whose membership is comprised of the parties to the 1954 Decree (Decree Parties)

Roles of the DRBC and the Parties to the Supreme Court Decree

The [DRBC](#), a federal-interstate compact agency established in 1961, consists of the governors of each of the four basin states and a federal representative appointed by the president ([Ref. 5](#)). The Decree Party representatives are the governors of the four basin states and the mayor of NYC.

The compact establishing the DRBC provided the Commission with the authority, in accordance with the doctrine of equitable apportionment, to allocate the waters of the basin to and among the States that are signatory to the DRBC compact and to and among their political subdivisions, and to impose conditions, obligations and release requirements related thereto, all subject to certain conditions and limitations. A key limitation is that the Commission may not, without the unanimous consent of the parties to the 1954 amended Supreme Court decree^a, diminish or otherwise adversely affect the diversions, compensating releases, rights, conditions, obligations and provisions for the administration thereof contained in the decree ([Ref. 5](#)).

With the benefit of experience and time, the Commission has identified areas where a departure from strict application of the terms of the decree can assist in the conservation of the basin's waters and resources. The Commission has worked successfully with the Decree Parties to secure their unanimous consent to a series of understandings aimed at protecting public health

^a The Compact also states that DRBC, after consultation with the River Master, may by unanimous consent of its members declare a state of emergency resulting from a drought or catastrophe and may authorize and direct an increase or decrease in any diversion permitted or releases required by the Decree, in such manner and for such limited time as may be necessary to meet such emergency condition.

and welfare during times of drought and enhancing the basin's fisheries. The most significant of these understandings are a set of consensus recommendations contained in the Decree Parties' "Good Faith Recommendations" for interstate water management of 1982 (*Ref. 6*). The most important of these were enacted by the Commission in Resolutions Nos. 83-13, 84-7, and 88-22 (Revised) and were codified at Sections 2.5.3 through 2.5.6 of the DRBC Water Code, generally known as the "reservoir drought operating plans" (*Ref. 7*). The measures incorporated in these resolutions were prompted by a record drought in the 1960s and were made to conserve storage and ensure flow augmentation during a repetition of such conditions. The drought operating plans, which consist of phased reductions in diversions and releases based upon reservoir storage curves, have been invoked numerous times since their adoption in the early 1980s.

In addition to the drought operating plans resulting from the Good Faith process, further understandings have been reached through DRBC Docket D-77-20 CP and amendments thereto (*Ref. 8*) with respect to fishery management below the three NYC Delaware Basin reservoirs. As was the case with the DRBC drought management plans, these understandings have been adopted and amended by unanimous consent of the Decree Parties and the Commission.

Development of Release Program for the New York City Delaware Basin Reservoirs Based on Docket D-77-20 CP and its Revisions

The efforts of fisheries biologists and water resources program managers of the New York State Department of Environmental Conservation (NYSDEC), combined with negotiations among the Decree Parties, and DRBC docket approvals, have resulted in a series of programs embodied in Docket D-77-20 CP and Revisions 1 through 8 thereto, aimed at improving cold water fisheries below the three NYC Delaware Basin reservoirs. These programs have included minimum conservation releases, storage banks, and most recently, tail water flow targets downstream of the three reservoirs. A chronology of the various release programs is presented here.

Basic Conservation Releases

The Supreme Court Decrees of 1931 and 1954 contained no provisions for minimum conservation releases. The original conservation release schedules for Neversink and Pepacton Reservoirs were established via an informal agreement between the NYC Board of Water Supply and the New York State Conservation Department. The state permit to build Cannonsville Reservoir was conditioned on establishing a basic conservation release schedule for that facility. Subsequently, these conservation release schedules were established as a result of the settlement of claims of riparian landowners brought in the New York State Supreme Court. The basic conservation releases for all three reservoirs are shown in Table 1, Column 1.

1977 Experimental Program

New York State, with the agreement of NYC, proposed a two-year experimental program in 1977 based on NYSDEC Part 671 reservoir releases regulations for Cannonsville, Pepacton, and Neversink Reservoirs pursuant to Title 8 of Article 15 of the Environmental Conservation Law. The program provided for augmented conservation releases for the purpose of enhancing the downstream fishery below each of the three NYC dams. To offset the additional demand created by these augmented conservation releases, the Decree Parties unanimously agreed to suspend release of the "Excess Release Quantity" (ERQ) defined Sections III.B.1(c) and (d) of the Decree and use this volume of water to create an "Excess Release Bank" to support the augmented

conservation release program. This proposal resulted in approval by DRBC of Docket D-77-20 CP on May 25, 1977. Since then, conservation releases made under the 1977 Experimental Program and all those made under subsequent fisheries releases programs have been and continue to be directed by New York State, which provides an annual accounting of the use of banked storage for review by NYC and the River Master.

DRBC Docket D-77-20 CP

DRBC Docket D-77-20 CP established a new schedule of augmented conservation releases for the three NYC Delaware Basin reservoirs. The augmented releases in this experimental program initially ranged from 25 cfs to 70 cfs, with a two-month summer release rate of 325 cfs from Cannonsville. The large rate of release from Cannonsville was a function of limitations on ability to control incremental releases from the Cannonsville outlet works. The release schedule established by D-77-20 CP was extended by a series of eight DRBC resolutions through May 31, 1983.

In addition to establishing the augmented conservation releases, Docket D-77-20 CP set up a program of special releases from the reservoirs to relieve thermal stress conditions that posed a threat to tailwater fisheries. A thermal stress “bank” provided for coldwater releases from the bottom layer of reservoir storage to control increases of stream temperature during hot weather. The total volume of the thermal bank, which became available on June 1 of each year, was approximately 3.9 billion gallons (bg), or 6,000 cfs-days. Releases could be made from the thermal bank when the water temperature at designated locations downstream of the reservoirs was expected to rise above 75° F as an instantaneous measurement or 72° F as a daily average. Any remainder in the thermal bank was automatically nullified after October 31 of each year.

The original Docket D-77-20 CP provided that the combined total of the augmented releases and thermal releases could not exceed the total quantity of water in the excess release bank. This requirement, however, was eliminated in 1983 in the first revision of the docket.

Docket D-77-20 CP also called for the formation of a task group, to include representatives of the five Decree Parties. The group was asked, among other things, to prepare criteria for defining the onset and stages of drought or water shortage emergencies. Such criteria were to include consideration of reservoir storage levels, stream flow, ground water conditions, and meteorological conditions. The responsibilities of the task group also included preparing an emergency diversion, water allocation and release plan for implementation by the Commission at various defined drought stages. The task group was the forerunner of DRBC’s Flow Management Technical Advisory Committee (FMTAC), created in 1983, and its successor, the Regulated Flows Advisory Committee (RFAC), established in 2005.

DRBC Docket D-77-20 CP has been revised since 1977 through a series of Docket amendments and/or DRBC Resolutions. DRBC dockets represent commission approvals of projects that are subject to review under Section 3.8 of the DRBC Compact. Resolutions are commission actions related to DRBC regulations, DRBC administrative activities, and are also used to extend or modify existing projects approved by docket under Section 3.8 of the Compact. Whenever Docket D-77-20 CP has been revised by a DRBC resolution, a docket revision number has also been assigned to reflect the change.

DRBC Docket D-77-20 CP - Revised

Following public hearings held in the early 1980s, the experimental augmented release schedule established in the original 1977 docket became permanent when the DRBC approved the first revision to Docket D-77-20 CP on November 30, 1983. The release schedule is shown in Table 1, Column 2.

Based on findings of the task group created by the original docket, the revised 1983 docket linked the augmented conservation releases to a basin-wide drought operating plan. This plan established criteria for drought warning and drought emergency based on the combined storage of the three NYC Delaware Basin reservoirs. It also established that the augmented releases would be reduced to the basic conservation releases when the basin was determined to be in a drought warning or emergency. This had the effect of reducing the number of drought operating days caused by the augmented releases. The conservation releases would return to the augmented levels following a drought when the combined storage reached 25 billion gallons (bg) above the drought warning level and remained above that level for 15 consecutive days.

This first revision to Docket D-77-20 CP was the last modification of the fishery releases program to be approved without a requirement for reconsideration or an expiration date.

DRBC Docket D-77-20 CP (Revision 2)

The DRBC approved a temporary revision of Docket D-77-20 CP (Revised) on June 23, 1993 to provide for new summer augmented releases from Pepacton and Neversink Reservoirs on an experimental basis through May of 1996. The revised release rates for the two reservoirs are shown in Table 1, Column 3.

This action was based on the experience gained after the augmented rates were made permanent in 1983. Docket D-77-20 CP (Revision 2), however, did *not* call for a change to the annual total quantity of releases from the reservoirs.

The release rates at Cannonsville Reservoir were not revised, because a new conservation release valve had not yet been installed. The second revision noted that the installation of the valve, scheduled for completion by the end of 1994, would provide for better control of releases for fisheries management.

DRBC Docket D-77-20 CP (Revision 3)

In the third revision of the docket, approved on a temporary basis by the DRBC on February 26, 1997, the augmented release rates for Cannonsville Reservoir were adjusted based on the improved capability of the new conservation release valve. The maximum conservation release from Cannonsville Reservoir was reduced from 325 to 160 cfs, but was extended from June 1 through September 15. The rate was decreased to 45 cfs on September 16. These revised rates are shown in Table 1, Column 3. Docket D-77-20 CP (Revision 3) also provided an additional 2.07 bg, or 3,200 cfs-days, for thermal stress reduction and continued the experimental augmented release program for another three years, through May of 2000.

DRBC Docket D-77-20 CP (Revision 4)

Revision 4 was approved by the DRBC on April 28, 1999. It extended the release schedule for Cannonsville Reservoir that was included in Revision 3. It also implemented a temporary, two-

year modification to the basin-wide drought operating plan, allowing, among other things, a portion of the Excess Release Quantity as defined in the Decree, to be used directly for enhancing the fisheries in the tailwaters below the reservoirs. A drought watch stage temporarily replaced the upper portion of the drought warning stage on the DRBC storage-based rule curve codified at Section 2.5.3 of the Water Code (See Figure 1). The drought watch stage provided for the same Trenton and Montague flow targets and NYC diversion as did the upper half of the drought warning stage in the codified drought operating plan. However, the 100-mgd diversion to northern New Jersey was not required to be reduced during drought watch. Conservation releases from the NYC reservoirs during a drought watch were decreased to 85 percent of the augmented experimental level, and the remaining thermal stress bank was decreased by 15 percent.

Revision 4 provided that, for the duration of the revision, one-half of the ERQ (approximately 5,700 cfs-days in a non-leap year) would be held and placed in a “fishery protection bank” and made available to augment releases during drought warning (the lower portion of the prior drought warning stage on the DRBC storage-based rule curve). The remaining half of the ERQ would continue to be available to benefit downbasin users or could be banked in accordance with a lower basin drought management plan. This revision extended the augmented experimental release program by two more years, through April 2001; DRBC Resolution No. 2001-5 subsequently extended Revision 4 for an additional year, through April 30, 2002.

DRBC Docket D-77-20 CP (Revision 5)

Revision 5, approved on April 3, 2002 by DRBC Resolution No. 2002-6, extended through April 30, 2003 the experimental program established by Revision 4. Revision 5 established a temporary habitat bank for support of experimental flow targets on the West Branch of the Delaware River at Hale Eddy, NY and modified the minimum releases from Cannonsville Reservoir. The source of the temporary habitat bank (5,700 cfs-days) was the half of the ERQ that had already been temporarily devoted to the fisheries under Revision 4. The remaining half of the down-basin states’ ERQ continued to be available to benefit downbasin users or could be banked in accordance with a lower basin drought management plan.

DRBC Docket D-77-20 CP (Revision 5) (Amended)

Revision 5 (Amended), approved on July 17, 2002 by DRBC Resolution No. 2002-21, clarifies and extends certain provisions in Revision 5. It defined explicitly the total quantity of water in the thermal releases bank (9,200 cfs-days) and extended its use from October 31, 2002 to April 30, 2003. In addition, allowance was made (with the concurrence of New York City) to use the Habitat Bank for augmenting flows at specified locations on the tributaries below the three NYC reservoirs. It also allowed for the Habitat Bank to be used to augment conservation releases to the summer baseline release levels, during drought warning conditions.

DRBC Docket D-77-20 CP (Revision 6)

Revision 6, approved on March 19, 2003 by DRBC Resolution No. 2003-4, reduced the habitat bank that had been established in the previous Revision 5 (Amended) to 4567 cfs-days and extended the provisions of Revision 5 (Amended) through April 30, 2004. It also established more detailed rules for utilizing the Thermal and Habitat Release Banks. Finally, it reaffirmed the West Branch Delaware flow target schedule and the Cannonsville release schedule as specified in Resolution No. 2001-21.

DRBC Docket D-77-20 CP (Revision 7)

DRBC Resolution No. 2004-3 superseded and incorporated certain provisions of Dockets D-77-20 CP (Revisions 2 through 6) to establish an interim conservation release program for the NYC Delaware Basin reservoirs for the period beginning May 1, 2004 and ending May 31, 2007. The Decree Parties committed to continuing discussions with the objective of developing and implementing by May 31, 2007 a long-term flexible program to manage releases from the NYC Delaware Basin reservoirs, based upon sustainable resources, to better address the needs of the tailwater fisheries and other needs, including those associated with both withdrawal and nonwithdrawal uses on the mainstem Delaware River down through the Delaware Bay, taking into account New York City's water supply needs and the four states' water requirements.

This resolution continued the designation of drought watch and drought warning diversions and releases as specified in Revision 4. It established a 20,000 cfs-day (12.9 bg) Habitat Protection Bank (HPB) for habitat and thermal protection of the tailwaters below each of the NYC Delaware Basin reservoirs, consisting of the following three smaller, or "sub" banks:

1. Excess Release Quantity Bank (ERQB) of 5,700 cfs-days
2. Thermal Release Bank (TRB) of 9,200 cfs-days
3. Supplemental Release Bank (SRB) of 5,100 cfs-days

The Lake Wallenpaupack drought operating plan instituted by Resolution No. 2002-33 provided for the use of lake storage to meet the Montague flow target during watch, warning and drought operations. Because the plan has the effect of conserving storage in the NYC reservoirs, it resulted in a benefit to the Basin through a substantial reduction in the modeled number of drought operating days which result from the fisheries releases. The use of water from Lake Wallenpaupack to meet the Montague target results in fewer and reduced directed releases from the NYC reservoirs – releases which directly benefit the tailwater fisheries below NYC's Delaware River Basin reservoirs. Consequently, in addition to the three-part Habitat Protection Bank, an Amelioration Bank (AB) of 3,000 cfs-days was established in Revision 7 to provide water to mitigate the potential impacts to the fisheries that may result from the Lake Wallenpaupack drought operating plan. In years during which such plan is in effect, the AB is available during drought watch, drought warning and drought operations, subject to certain conditions and limitations.

Upon entry into drought, habitat protection, including thermal protection, may be provided, subject to the availability of the ERQB and at the discretion of the downbasin parties to the Decree.

Revision 7 specified flow targets for, the East Branch Delaware River at Harvard, NY and the Neversink River at Bridgeville, NY in addition to the previous target for the West Branch Delaware River at Hale Eddy, NY. During normal hydrologic conditions, the flow targets are 225 cfs at Hale Eddy, 175 cfs at Harvard and 115 cfs at Bridgeville. These targets are reduced in drought watch, drought warning and drought in accordance with Table 2. Minimum conservation releases established by Revision 7 for the three reservoirs are shown in Table 3. The minimum summer releases are lower than those in D-77-20 CP Revision 4, provided that the flow targets below the reservoirs are met. The difference between the releases resulting from Revision 7 and the reference releases in Revision 4 are debited or credited to the HPB, except

that a negative balance in the HPB is not allowed. If banks are exhausted and targets cannot be met, the conservation releases continue as specified in Revision 4.

To maintain high quality water for New York City, diversions from Cannonsville Reservoir may be curtailed and diversions of higher quality water from Neversink Reservoir may be increased. Also, flow targeting at Bridgeville may be suspended, depending on water quality criteria at Cannonsville to protect the quality of drinking water diverted to New York City. The criteria for suspension of the Bridgeville target include concentrations of total phosphorus, coliform, turbidity and total phytoplankton.

If the combined storage of the three NYC Delaware Basin reservoirs drops below 25 percent of usable capacity (67.7 bg), water can be made available from the ERQB, with the concurrence of the down-basin parties to the Decree, and flow targeting may be suspended until storage recovers to 5 bg above the Drought Watch line for one day.

Revision 7 requires that NYSDEC conduct an evaluation of the response to the new fisheries releases program of tailwater biota, particularly brown and rainbow trout populations, based on an approved Monitoring Plan. It further provides for interim progress reports by the NYSDEC to be submitted to the DRBC by February 28, 2005 and 2006. By December 31, 2006, NYSDEC must submit a draft scientific report to the DRBC of the effects on the fishery and other aquatic resources resulting from implementation of the tailwater fisheries program. A final report is to be submitted to DRBC and the Decree Parties by NYSDEC by May 31, 2007.

DRBC Docket D-77-20 CP (Revision 8)

Docket D-77-20 CP (Revision 8), approved by Resolution No. 2004-9, allowed that portion of the ERQ not earmarked for protecting tailwater fisheries below the NYC Delaware Basin reservoirs, to be used for certain purposes including aquatic resource research related to the fisheries program, including dwarf wedgemussel studies conducted at the request of the U.S. Fish and Wildlife Service. Revision 8 made no change to the terms of the Habitat Protection Bank established by Revision 7, which will expire on May 31, 2007 or earlier in accordance with the provisions of Revision 7, Paragraph 9.

Other Actions by DRBC and the Decree Parties

Formation of the Subcommittee on Ecological Flows (SEF)

Resolution No. 2003-18 formalized a process for developing and evaluating the feasibility of achieving flow targets to address instream flow and freshwater inflow requirements for aquatic ecosystems in the Delaware River Basin, including the Delaware Bay. It also established a Subcommittee on Ecological Flows (SEF) to assist the DRBC's RFAC (and formerly, the FMTAC) in developing scientifically-based ecological flow requirements for the maintenance of self-sustaining aquatic ecosystems.

The Commission and the Decree Parties committed to participating in a non-binding collaborative process to develop experimental flow management options for the Delaware River and its regulated tributaries. The objectives include development of scientifically-based ecological flow requirements, objective recreational needs assessments, a review of the estuary

salinity objective, and an assessment of existing and future municipal, industrial and other water supply needs.

The purpose of the SEF is to assist in developing scientifically-based ecological flow requirements. The SEF provides regular progress reports to the RFAC and works with the DRBC's RFAC and the Water Management Advisory Committee (WMAC) in a collaborative way. Membership of the SEF includes at least one member of the RFAC who is a Decree Party member and at least one member of the WMAC who is not a Decree Party member.

Flow Modeling

Since the early 1980's, daily flow and salinity modeling has been used to compare alternative reservoir operating rules for the Delaware River Basin's major reservoirs, including Beltzville, Blue Marsh, Nockamixon and F.E. Walter Reservoirs, in addition to the NYC reservoirs. A separate document entitled "Delaware River Basin Daily Flow Model" describes the development of the flow modeling capability. This document is available from DRBC on request.

References

1. Supreme Court of the United States, Delaware Diversion Case, *State of New Jersey v. State of New York and City of New York*, Opinion of Justice Holmes, May 4, 1931.
2. Supreme Court of the United States, Amended Decree, *State of New Jersey v. State of New York and City of New York*, June 7, 1954.
3. U.S. Geological Survey, Office of the Delaware River Master, Internet web site, <http://www.rvares.er.usgs.gov/orh/nrwww/public/odrm>.
4. U.S. Geological Survey, Report of the River Master of the Delaware River, U.S. Geological Survey Open File Report, Filed Annually from 1955 to Present.
5. Delaware River Basin Commission, Delaware River Basin Compact, Section 3.3, Paragraph a, October 27, 1961.
6. States of Delaware, New Jersey, New York, and Pennsylvania, and New York City, Interstate Water Management 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.
7. Delaware River Basin Commission, Delaware River Basin Water Code, December 1996.
8. Delaware River Basin Commission, Docket D-77-20 CP, May 1977; Docket D-77-20 CP (Revised), November 1983; Docket D-77-20 CP (Revision 2), June 1993; Docket D-77-20 CP (Revision 3), February 1997; and Docket D-77-20 CP (Revision 4), April 1999.

Table 1
Reservoir Release Rates

| <i>Reservoir and Operative Dates</i> | (Column 1) <i>Basic Conservation Release</i> | (Column 2) <i>Augmented Conservation Release^a</i> | (Column 3) <i>Augmented Experimental Conservation Release^b</i> |
|--|---|---|--|
| <u><i>Pepacton</i></u> | | | |
| 1/1 - 3/31 | 6 cfs | 50 cfs | 45 cfs |
| 4/1 - 4/7 | 6 | 70 | 45 |
| 4/8 - 4/30 | 19 | 70 | 45 |
| 5/1 - 5/31 | 19 | 70 | 70 |
| 6/1 - 8/31 | 19 | 70 | 95 |
| 9/1 - 9/30 | 19 | 70 | 70 |
| 10/1 – 10/31 | 19 | 70 | 45 |
| 11/1 – 12/31 | 6 | 50 | 45 |
| <u><i>Neversink</i></u> | | | |
| 1/1 - 3/31 | 5 cfs | 25 cfs | 25 cfs |
| 4/1 - 4/7 | 5 | 45 | 25 |
| 4/8 - 4/30 | 15 | 45 | 25 |
| 5/1 - 9/30 | 15 | 45 | 53 |
| 10/1 – 10/31 | 15 | 45 | 25 |
| 11/1 – 12/31 | 5 | 25 | 25 |
| <u><i>Cannonsville</i></u> | | | |
| 4/1 - 4/15 | 8 cfs | 45 cfs | 4/1 – 5/31: 45 cfs |
| 4/16 - 6/14 | 23 | 45 | |
| 6/15 - 8/15 | 23 | 325 | 6/1 – 9/15: 160 cfs |
| 8/16 – 10/31 | 23 | 45 | |
| 11/1 - 11/30 | 23 | 33 | |
| 12/1 - 3/31 | 8 | 33 | 9/16 – 3/31: 45 cfs |

^aD77-20 CP Revised^bD77-20 CP Revision 2

Table 2
Habitat Protection Bank Flow Targets (D77-20 CP (Revision 7))

| <i>Target Location</i> | <i>Flow Target (cfs)</i> | | | |
|--|--------------------------|--------------------------|----------------------------|----------------------------|
| | <i>Normal</i> | <i>Drought Watch</i> | <i>Drought Warning</i> | <i>Drought^a</i> |
| West Branch Delaware R At Hale Eddy | 225 | 190 | 160 | 145 |
| East Branch Delaware R At Harvard | 175 | 150 | 120 | 115 |
| Neversink River At Bridgeville | 115 | 100 | 80 | 75 |

^a Subject to the availability of the ERQB and at the discretion of the down-basin parties to the 1954 U. S. Supreme Court Decree, or availability of the Amelioration Bank (AB).

Table 3
Conservation Releases (D-77-20CP Revision 7)

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

Figure 1
New York City Delaware Basin Reservoir Experimental Rule Curve

