



## Delaware River Basin Commission

25 State Police Drive  
PO Box 7360  
West Trenton, New Jersey  
08628-0360

Phone: (609) 883-9500 Fax: (609) 883-9522  
Web Site: <http://www.drbc.net>

Carol R. Collier  
Executive Director

Robert Tudor  
Deputy Executive Director

June 19, 2003

Mr. David K. Burd, Director  
Merrill Creek Reservoir  
34 Merrill Creek Road  
Washington, NJ 07882

Subject: Merrill Creek Reservoir Plan of Operation  
Docket D-77-110 CP (Amendment 1)

*Deve*  
Dear Mr. Burd:

We have reviewed proposed Revision 1 of the "Plan of Operation for the Merrill Creek Reservoir" in accordance with the provisions of Docket D-77-110 CP (Amendment 1). We appreciate your coordination with the Operations Branch staff and your efforts in updating data collection procedures and providing explicit definitions of terms and consumptive use replacement accounting.

In accordance with condition "m" of Docket D-77-110 CP (Amendment 1), the document entitled "Plan of Operation for the Merrill Creek Reservoir - (Revision 1)" is hereby approved and a signed copy is enclosed. We look forward to your continued cooperation in matters related to Merrill Creek operation, and thank you for your continuing close coordination with the DRBC staff.

Sincerely,

Carol R. Collier  
Executive Director

Enclosure

**DELAWARE RIVER BASIN COMMISSION  
DOCKET NO. D-77-110 CP (Amendment 1)**

**PLAN OF OPERATION  
FOR THE  
MERRILL CREEK RESERVOIR  
(REVISION 1)**

**Prepared by Merrill Creek Owners Group**

Approved: June 19, 2003

PLAN OF OPERATION  
FOR THE  
MERRILL CREEK RESERVOIR  
  
(REVISION 1)

PREAMBLE: This Plan of Operation is in fulfillment of Condition m of Docket No. D-77-110 CP (Amendment 1), hereinafter referred to as "the Docket" and attached as Exhibit II. When appropriate, conditions of the Docket that prescribe operating criteria set forth in this Plan of Operation are indicated in parentheses.

- I. Definitions and abbreviations for the purpose of this Plan of Operation
  - A. Commission: the Delaware River Basin Commission.
  - B. MCOG: the Merrill Creek Owners Group.
  - C. Designated Units: the generating units listed in Table A (and as revised) of the Docket.
  - D. FECU: the Freshwater Equivalent Consumptive Use (mg) of a Designated Unit as calculated in accordance with Exhibit I (attached).
  - E. Compensation Releases: releases (mg) from Merrill Creek Reservoir to compensate for the FECUs of the Designated Units, in lieu of curtailment of the consumptive use by the Designated Units.  
(Condition b) The Compensation Release on a given day shall equal the combined total of the FECUs of all Designated Units on the previous day. Until a Designated Unit begins commercial operation, that unit's FECU shall not be included in the Compensation Release.
  - F. Trenton Gage: the USGS gaging station on the Delaware River at Trenton.
  - G. Equivalent Flow at Trenton: the flow (cfs) measured at the Trenton gage adjusted to include the directed release from Blue Marsh Reservoir and to exclude the Compensation Release from Merrill Creek

Reservoir. The Equivalent Flow at Trenton shall be calculated as specified in Section IV.A.1. (Condition c)

H. cfs: cubic feet per second.

I. m.s.l.: mean sea level.

J. AF: acre-feet.

K. mg: million gallons.

L. mg/l: milligrams per liter.

II. Data to be used by Merrill Creek Reservoir Staff to determine whether filling is permissible or releasing is required and for filling or releasing operations

A. Each day during the normal workweek, Commission Staff will make the following data available to Merrill Creek Reservoir Staff:

1. Average daily flow (cfs) measured at the Trenton Gage on the previous day.
2. Flow (cfs) at the Trenton Gage at approximately 8:00 AM on the current day.
3. Average daily directed release (cfs) in excess of the conservation release (cfs) from Blue Marsh Reservoir for the previous day and (if not provided earlier) for the second previous day.
4. Seven-day average location of salt front (250 mg/l isochlor).
5. Flow objective (cfs) at the Trenton Gage.

B. Other than during the normal workweek, or if the data are not available from the Commission, Merrill Creek Reservoir Staff shall obtain and use data as follows:

1. Average daily flow (cfs) measured at the Trenton Gage on the previous day as posted on the USGS website. If not available, then the most recent available average daily flow (cfs) shall be used.
2. Flow (cfs) at the Trenton Gage at approximately 8:00 AM on the current day as obtained via from the gage via telephone or as posted on the USGS website. If not available, then the most recent flow (cfs) measured at the Trenton Gage either provided by Commission Staff or posted on the USGS website shall be used.

3. Most recent average daily directed release (cfs) in excess of the conservation release (cfs) from Blue Marsh Reservoir provided by Commission Staff.
4. Most recent seven-day average location of salt front (250 mg/l isochlor) provided by Commission Staff.
5. Most recent flow objective at the Trenton Gage provided by Commission Staff.

### III. Filling

- A. All inflow to Merrill Creek Reservoir may be retained provided that releases are made in accordance with Section IV.
- B. Delaware River water may be withdrawn for filling Merrill Creek Reservoir in accordance with the pumping schedule set forth in Table B of the Docket. (Condition g) When using Table B for determination of the maximum number of pumps to be operated on a given day, the "Delaware River flow at Trenton" is:
  1. The average daily flow (cfs) measured at the Trenton Gage on the previous day
  2. Plus the average quantity withdrawn on the second previous day (cfs).

### IV. Releasing

- A. Delaware River:
  1. For purposes of determining when Compensation Releases shall be made to the Delaware River, the Equivalent Flow at Trenton shall be calculated as specified below:
    - a. The Equivalent Flow at Trenton for the current day shall be calculated as:
      - The flow (cfs) measured at the Trenton Gage at approximately 8:00 AM of the current day
      - Plus the average daily directed release (cfs) in excess of the conservation release (cfs) from Blue Marsh Reservoir for the previous day

- Less the average daily rate (cfs) of the Compensation Release from the Merrill Creek Reservoir for the previous day.
- b. The Equivalent Flow at Trenton for any given day prior to the current day shall be calculated as:
- The average daily flow (cfs) measured at the Trenton Gage for the given day
  - Plus the average daily directed release (cfs) in excess of the conservation release (cfs) from Blue Marsh Reservoir for the day previous to the given day
  - Less the average daily rate (cfs) of the Compensation Release from the Merrill Creek Reservoir for the day previous to the given day.
2. Unless the Commission directs otherwise, a Compensation Release shall be made to the Delaware River on each day when: (Conditions a and c)
- a. The Commission's current drought management plans (DRBC Resolutions Nos. 83-13 and 88-22 (Revised)) or future drought management plans cause the flow objective at the Trenton Gage to drop below 3,000 cfs; and
- b. The Equivalent Flow at Trenton for the current day and the Equivalent Flow at Trenton for the day previous to the current day are both below 3,000 cfs.
3. The Commission may direct Compensation Releases to be made on any day when the Equivalent Flow at Trenton was below 3,000 cfs for five (5) consecutive days due to reasons beyond the control of the Commission, even if the flow objective at the Trenton Gage has not been reduced to less than 3,000 cfs. (Condition a)
4. Releases to the Delaware River when the water surface elevation of the Merrill Creek Reservoir is above elevation 923 ft. m.s.l. shall be coordinated with the Commission.

B. Lower Merrill Creek

1. Water shall be released in sufficient quantity to maintain a minimum flow of 3.0 cfs downstream of the dam at all times.  
(Condition h)
2. Additional releases may be required to maintain the desired fish population as determined by monitoring studies. Such increased releases that exceed reservoir inflow or 3 cfs, whichever is greater, shall be considered as part of Compensation Releases, if being made. (Condition j)
3. The maximum rate of release shall be 20 cfs. (Condition h)
4. Releases shall be regulated so that rapid fluctuations in stream flow do not occur. (Condition k)
5. With prior consent of the Commission and the NJDEP, water that would otherwise be released directly to the Delaware River may be released to Lower Merrill Creek for the benefit of the stream's aquatic biota. (Condition i)
6. When the water surface elevation of the Merrill Creek Reservoir is above elevation 923 ft. m.s.l., the rate of release shall be a rate that is expected to restore a surface elevation of 923 ft. m.s.l. within a reasonable time. If a release is to be made to the Delaware River, this Section IV.B.6 does not apply (see Section IV.A.4.).

V. Reporting

A. When Merrill Creek Reservoir is releasing to the Delaware River:

1. The following information will be provided daily to the Commission:
  - a. Estimated average rate (cfs) and total amount (mg) of release to the river expected for that day. Name of each Designated Unit and the quantity (mg) of Compensation Release for each.  
Description and respective amount (mg) of any other release to the river.

- b. Actual amount (mg) and average daily rate (cfs) of the Compensation Release made the previous day.
  - c. Any portion of the water released to Lower Merrill Creek that is considered part of the Compensation Release will be stated separately. (Condition j)
  - d. Reservoir water surface elevation (ft. m.s.l.) and volume of useable storage (AF) as of approximately 8:00 AM on that day.
2. A written report summarizing the daily information for the preceding calendar month will be provided to the Commission by the 10th day of each month.

B. When Merrill Creek Reservoir is withdrawing from the Delaware River:

1. The following information will be provided weekly (on Monday) to the Commission:
- a. Estimated average rate (cfs) and total amount (mg) of withdrawal from the river each day for the previous seven days.
  - b. Reservoir water surface elevation (ft. m.s.l.) and volume of useable storage (AF) as of approximately 8:00 AM on Monday morning.
2. A written report summarizing the daily information for the preceding calendar month will be provided to the Commission by the 10th day of each month.

C. When Merrill Creek Reservoir is neither releasing to nor pumping from the Delaware River:

1. A written report on reservoir water surface elevation (ft. m.s.l.) and volume of useable storage (AF) as of each Monday will be provided to the Commission by the 10th day of each month.
2. Any significant event that could affect the normal operation of the Merrill Creek Reservoir will be reported promptly to the Commission.



VI. Modification of Plan of Operation

- A. Should modification of this Plan of Operation seem appropriate or necessary, MCOG may present information in support of the modification to the Executive Director of the Commission for consideration and action. (Condition m).

VII. Communications

- A. All communications concerning this Plan of Operation should be addressed to the following duly authorized representatives of the Commission and MCOG, or in the absence of such representatives to their alternates. The Commission and MCOG may change their respective authorized representatives and alternates at any time by written notice to the other's authorized representative.

1. Commission:

a. Phone/Fax/E-mail:

Ms. Carol R. Collier (Executive Director)  
609-883-9500 ext. 200 (o)  
215-643-3259 (h)  
609-883-9522 (f)  
[ccollier@drbc.state.nj.us](mailto:ccollier@drbc.state.nj.us)

Mr. Richard K. Fromuth (Head, Operations Branch)  
609-883-9500 ext. 232 (o)  
215-321-0133 (h)  
609-883-9522 (f)  
[rfromuth@drbc.state.nj.us](mailto:rfromuth@drbc.state.nj.us)

b. Mail:

Delaware River Basin Commission  
25 State Police Drive  
Post Office Box 7360  
West Trenton, NJ 08628-0360

2. MCOG:

a. Phone/Fax/E-mail

Mr. David K. Burd, (Director-MCR)

908-454-8831 (o)

609-397-1564 (h)

609-841-0267 (c)

800-778-8060 (p)

908-454-2747 (f)

dkburd@merrillcreek.com

James Mershon (Advanced Scientist)

908-454-1252 (o)

973-691-0621 (h)

609-932-8396 (c)

732-405-4282 (p)

908-454-2747 (f)

jmershon@merrillcreek.com

b. Mail:

Merrill Creek Reservoir

34 Merrill Creek Road

Washington, NJ 07882

Revision 1 approved:

Carl R. Collin

Executive Director

Delaware River Basin Commission

6/19/03

Date

EXHIBIT I (Revised)

FRESHWATER EQUIVALENT CONSUMPTIVE USE  
METHOD OF CALCULATION

The Freshwater Equivalent Consumptive Use of a Designated Unit on a given day shall be calculated according to one of the methods described below, as appropriate.

Method A. Designated Units for which Consumptive Water Use is Calculated Based on Generation

$$\text{FECU} = \frac{\text{MMCU} \times \text{REF} \times \text{ACTUAL NET GENERATION} \times \text{K}}{\text{RATED CAPACITY}}$$

Where:

FECU is the volume of the freshwater equivalent consumptive use of the unit in million gallons for the given day.

MMCU is the monthly maximum consumptive use of the unit in cubic feet period second (cfs), defined as the maximum rate at which water is evaporated based on operation of the unit at its rated capacity, average monthly weather conditions and, for once-through units, average monthly receiving water temperature. The MMCU values shall be (a) the values reported to the Commission by the Delaware River Basin Electric Utility Group (DRBEUG) on October 2, 1985 or as subsequently revised or (b) values determined subsequent to October 2, 1985 and accepted by the Commission Staff.

REF is the relative effect factor of the unit (a) as reported to the Commission by DRBEUG on October 2, 1985 or as subsequently revised or (b) a value determined subsequent to October 2, 1985 and accepted by the Commission Staff. The REF applies to the Designated Units that withdraw water from the Delaware River Estuary.

ACTUAL NET GENERATION is the actual net megawatt-hours (MWHR) generated by the unit on the given day.

RATED CAPACITY is the unit's summer net capacity in MW.

K = .0269 million gallons per cfs-hour.

The owner/operator of the Designated Unit reports the daily ACTUAL NET GENERATION to MCR Staff. MCR Staff enter the reported daily ACTUAL NET GENERATION into the Merrill Creek Reservoir FECU Calculation & Reporting System. The System contains the MMCU, the REF, the RATED CAPACITY and the value of K, and calculates the FECU by applying those factors to the daily ACTUAL NET GENERATION.

Method B. Designated Units for which Consumptive Water Use is Determined by Metering

$$\text{FECU} = \text{METERED CONSUMPTIVE USE} \times \text{REF}$$

Where:

FECU and REF are as defined for Method A, above.

METERED CONSUMPTIVE USE is the gross consumptive water use of the unit on the given day in million gallons, as determined by metering. If the Designated Unit has a discharge, METERED CONSUMPTIVE USE is the difference between the metered withdrawal and the metered discharge. If the Designated Unit has no discharge, METERED CONSUMPTIVE USE is the metered withdrawal.

The owner/operator of the Designated Unit reports daily METERED CONSUMPTIVE USE to MCR Staff. MCR Staff enter the reported daily METERED CONSUMPTIVE USE into the Merrill Creek Reservoir FECU Calculation & Reporting System. The System contains the REF and calculates the daily FECU by applying the REF to the daily METERED CONSUMPTIVE USE.

Method C. Designated Units for which Consumptive Water Use is Determined by Other Method Approved by the Commission

$$\text{FECU} = \text{CONSUMPTIVE USE} \times \text{REF}$$

Where:

FECU and REF are as defined for Method A., above.

CONSUMPTIVE USE is the gross consumptive water use of the unit on the given day in million gallons, as determined by a method approved by the Commission specifically for the unit.

The owner/operator of the Designated Unit calculates daily CONSUMPTIVE USE and reports it to MCR Staff. MCR Staff enter the reported daily CONSUMPTIVE USE into the Merrill Creek Reservoir FECU Calculation & Reporting System. The System contains the REF and calculates the daily FECU by applying the REF to the daily CONSUMPTIVE USE.

## EXHIBIT II - Docket No. D-77-110 CP (Amendment 1)

DELAWARE RIVER BASIN COMMISSION  
P. O. BOX 7360  
WEST TRENTON, N. J. 08628

Project Review

NOTICE OF COMMISSION ACTION

Date: 5/25/90

Docket No. D-77-110 CP (Amendment 1)

Project Sponsor: Merrill Creek Owners Group  
c/o Philadelphia Electric Company  
2301 Market Street  
Philadelphia, Pennsylvania 19103  
Attention: Edward J. Cullen, Jr.

Project Description: application for approval of docket amendments

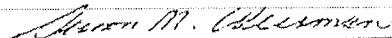
Referred by: -----

Action by Commission:

Included in the Commission's Comprehensive Plan for the Delaware River Basin and approved pursuant to Section 3.8 of the Delaware River Basin Compact. See attached docket for terms and conditions.

Explanatory Note:

The action has been taken by the Commission in accordance with its responsibilities under Sections 3.8, 11.1 and 11.2 of the Delaware River Basin Compact. The Commission maintains a comprehensive water resources plan for the Delaware River Basin and reviews water resources projects proposed by other public and private agencies. Review of projects enables the Commission to prevent conflicts among water users and to protect the integrity of the Comprehensive Plan.



Susan M. Weisman, Secretary

Enc.

cc: Michael F. Catania; Steven Nieswand; R. P. Holman, Philadelphia Electric Co.; Leroy T. Cattaneo, NJDEP; Richard Kropp, NJDEP; Mayor J. Richard Collins, Phillipsburg.

CP/3.8

DOCKET NO. D-77-110 CP (Amendment 1)

DELAWARE RIVER BASIN COMMISSION

Merrill Creek Owners Group (MCOG)<sup>1</sup>  
Merrill Creek Reservoir Project  
Warren County, New Jersey

PROCEEDINGS

This is an application submitted by the Merrill Creek Owners Group (MCOG) on November 1, 1989, for approval of certain amendments to the DECISION section of Delaware River Basin Commission (DRBC) Docket No. D-77-110 CP, approved October 24, 1984. The application was reviewed for inclusion of the amended project in the Comprehensive Plan and approval of the amended project under Section 3.8 of the Delaware River Basin Compact. A public hearing on this application was held by the DRBC on May 23, 1990.

DESCRIPTION

Purpose.-- The Merrill Creek project provides for low-flow augmentation in the Delaware River estuary and bay to replace present and future evaporative losses of cooling water by electric generating stations located in the Delaware River Basin. The requested amendments in this application include: a) Authorization for use of Merrill Creek releases to satisfy DRBC's drought objectives in lieu of curtailments for additional MCOG steam electric generating units not previously included in Table A of the DECISION (D-77-110 CP); b) Provisions for credit to the MCOG should the Commission order Merrill Creek releases for certain purposes specified in the DECISION; c) Provisions such that releases from Blue Marsh Reservoir directed by the Commission will be credited to the flow in the Delaware River at Trenton, for purposes of determining when Merrill Creek releases are to be made; and d) Provisions for a more detailed description of the operation of the project under the DECISION.

Location.-- The general location of the project facilities is shown on Figure A of Docket D-77-110 CP. The reservoir site is located on Merrill Creek, a tributary of Pohatcong Creek in Harmony Township, Warren County, New Jersey. The pump house is located at River Mile 192 on the Delaware River near Keifer Island. No changes in location of the Merrill Creek Project facilities are requested as part of the proposed amendments.

---

<sup>1</sup> MCOG is made up of the following members: (1) Atlantic City Electric Company, (2) Delmarva Power & Light Company, (3) Jersey Central Power & Light Company, (4) Metropolitan Edison Company, (5) Realty Company of Pennsylvania (a wholly-owned subsidiary of Pennsylvania Power & Light Company), (6) Philadelphia Electric Company (PECO), and (7) Public Service Electric & Gas Company.

Facilities.-- Merrill Creek Reservoir is formed by a compacted earth and rockfill dam constructed across the Scotts Mountain gap. The earth and rockfill dam, the emergency spillway, and the pump house water intake facility are described in Docket No. D-77-110 CP. The reservoir as constructed provides approximately 48,000 acre-feet of useable water supply for MCOG's augmentation needs.

Relationship to the Comprehensive Plan.-- The Merrill Creek Project was included in the Comprehensive Plan by Docket No. D-77-110 CP on October 24, 1984. The electric generating plants that have been included in the Comprehensive Plan and will benefit by releases from Merrill Creek storage include: Salem Units Nos. 1 and 2 (D-68-20 CP), Martins Creek Units Nos. 3 and 4 (D-70-25 CP), Limerick Units Nos. 1 and 2 (D-69-210 CP Final), and Hope Creek Unit No. 1 (D-73-193 CP). In addition, the Point Pleasant Pumping Station and related facilities, which will transfer water released from Merrill Creek to make up for consumptive use at the Limerick Electric Generating Station, were included in the Comprehensive Plan by Docket D-65-76 CP (2) on January 25, 1967, and the description subsequently revised by Docket D-65-76 CP (8) on February 18, 1981.

#### FINDINGS

The amendments requested in the application do not involve any proposed structures, changes to existing structures, acquisition or occupation of any additional land or construction activity.

The request to designate additional generating units to be included in the Merrill Creek Project is desirable. The Merrill Creek Project is constructed with sufficient capacity to assure the water supply needed to provide compensation releases to replace consumptive use by all MCOG "Designated Units" during periods when the flow in the Delaware River is below 3000 cfs, as measured at the Trenton gage. Avoiding the curtailment of electric generating capacity during low flow periods should assure a more stable economy and lessen the impact of droughts. Also, releases from Merrill Creek to make up for all current undesignated units would assist in salinity repulsion during low flow periods.

Table A (Revised) (attached hereto), proposed to replace Table A, Docket D-77-110 CP, shows the electric generating units that the MCOG requests be specified as "Designated Units" (electric generating plants that releases from Merrill Creek will support during low-flow periods).

Condition "D" of Docket D-77-110 CP requires MCOG to maintain a minimum flow of 3.0 cfs in lower Merrill Creek, and Condition "R" requires MCOG to adjust flow conditions to maintain the desired fish population based on the results of the monitoring program. However, Condition "R" also specifies that, "Increased releases that do not exceed reservoir inflow shall not be credited as compensation for consumptive water losses at electric generating



stations". As noted in the FINAL ENVIRONMENTAL IMPACT STATEMENT (FEIS) for the Merrill Creek Project, such augmentation to meet streamflow objectives was considered during the environmental review process as mitigation to provide partial compensation for the 3.7 miles of trout habitat that would be inundated by the reservoir. The mitigation was established through implementation of the National Environmental Policy Act (NEPA).

Examination of the FEIS for the Merrill Creek Project, public hearings held prior to approval of the Merrill Creek Project, and public hearings held prior to approval of related projects (such as the Point Pleasant Project and Limerick Project), reveals no references by the DRBC that releases from the Blue Marsh Reservoir would be or should be credited to the flow of the Delaware River at Trenton for purposes of determining whether MCOG shall make "Compensation Releases" from the Merrill Creek Reservoir Project. The requirement that the electric utilities in the basin must augment the low flows of the Delaware River to compensate for their consumptive use of water when the flow at Trenton, New Jersey, falls below 3,000 cfs is described in Dockets Nos. D-69-210 CP, D-70-25 CP, D-71-167 (Amended), D-73-193, D-77-110 CP, and Resolution No. 76-13.

On the other hand, drought operation formula setting forth diversion rates and streamflow objectives to provide guidance for reservoir operation, as included in DRBC Resolution 83-13 and adopted January 29, 1983, considered the directed releases from the Blue Marsh Reservoir and the Beltzville Reservoir effective in repelling salinity and meeting streamflow objectives at Trenton. Resolution 83-13 contains operation curves for the Upper Delaware River Basin-New York City Reservoirs (Cannonsville, Pepacton and Neversink). In order to plan for coordinated operation of other existing impoundments (such as Beltzville, Blue Marsh, Prompton, Nockamixon, and hydroelectric power reservoirs) during basinwide drought periods, and to complement the operating formula for the New York City reservoirs, the Commission adopted Resolution 84-7, August 25, 1984, which notes in Table 1 (Priority of Use for Existing Lower Basin Reservoirs During Drought) that the directed releases to the Schuylkill River from Blue Marsh Reservoir are considered as "Equivalent Flow" at Trenton for purposes of repelling salinity. Subsequently, the Commission amended the Comprehensive Plan, by Resolution 88-22, to include criteria and operations formulae for emergency operations during a lower basin drought warning and drought.

The request to provide a more detailed description of the operation of the project under the DECISION is desirable. A plan should be developed which would conform with the conditions stated herein, and should be flexible enough to accommodate unforeseen or changing circumstances. Further, the Executive Director should be authorized to approve and, if needed, to modify such plan.

The project does not conflict with nor adversely affect the Comprehensive Plan.

DECISION

I. The request to establish credits (as "Compensation Releases") for water released, in excess of reservoir inflow, to meet docket condition h. (defined herein) is hereby denied. Should the Commission direct MCOG to make releases for purposes other than specified in the docket conditions, it shall consider a MCOG request for relief and the Commission shall determine and provide relief that is equitable.

II. The subject project, as described in Docket No. D-77-110 CP and included in the Comprehensive Plan on October 24, 1984, is hereby amended and included in the Comprehensive Plan as follows:

a. Inclusion of additional "Designated Units" as listed in Table A (Revised).

III. The amended project is approved pursuant to Section 3.8 of the Compact subject to the following conditions:

a. "Compensation Releases," in lieu of curtailment, shall be made for all "Designated Units" listed in Table A (Revised) whenever the Commission's Drought Management Plan(s) (present or future) causes the flow objective at the Trenton gage to drop below 3000 cfs and the "Equivalent Flow" at Trenton drops below 3000 cfs. In addition, "Compensation Releases" will be required if and when the "Equivalent Flow" at Trenton drops below 3000 cfs for five consecutive days due to reasons beyond the control of the DRBC. Additional "Designated Units" may be added to Table A (Revised) after such units (projects) have received approval under Section 3.8 of the Compact.

b. Each electric generating unit which is a "Designated Unit" [See Table A (Revised)] shall be exempt from curtailment by the DRBC so long as the freshwater equivalent consumptive use resulting from the operation of that unit is being replaced by "Compensation Releases" from the Merrill Creek Reservoir Project.

c. For purposes of determining when Merrill Creek releases are to be made and in accordance with provisions governing basinwide and lower basin operations as set forth in Resolution 84-7 and Resolution 88-22, respectively, "Equivalent Flow" at Trenton will be used; i.e., directed releases from Blue Marsh Reservoir in excess of the conservation release from Blue Marsh Reservoir will be added to the flow at Trenton, with adjustment for the time of travel.

d. Approval is subject to all conditions imposed by the New Jersey Department of Environmental Protection (NJDEP) and the U. S. Army Corps of Engineers.

e. All project facilities shall be available at all times for inspection by the DRBC.

f. All project facilities shall be operated at all times to comply with all requirements of the DRBC.

g. The withdrawal of water from the Delaware River at the pumping station for diversion into Merrill Creek Reservoir must conform with the schedule and conditions in Table B, Docket D-77-110 CP.

h. MCOG shall maintain a minimum flow of 3.0 cfs in lower Merrill Creek upstream of the MCOG property boundary, which is 800 feet downstream of the dam. When the reservoir is full (water surface elevation at 923 feet above mean sea level), MCOG shall pass all the water entering the reservoir, up to a maximum of 20 cfs.

i. With prior consent of the DRBC and NJDEP, water that would otherwise be released directly to the Delaware River, may be released to lower Merrill Creek for the benefit of the stream's aquatic biota.

j. The applicant shall continue to monitor the impact of the project on the fish population in upper Merrill Creek and lower Merrill Creek and in the reservoir in accordance with MCOG's Fishery Management Plan. The applicant will increase the rate of release to lower Merrill Creek, or otherwise adjust flow conditions, to maintain the desired fish population based on the results of the monitoring studies. Increased releases (to maintain the desired fish population) that exceed reservoir inflow or 3 cfs, whichever is greater, shall be considered as part of the "Compensation Releases," if compensation for consumptive water losses at electric generating stations is required at that time.

k. Releases to lower Merrill Creek shall be regulated so that rapid fluctuations in streamflow do not occur.

l. MCOG shall continue to implement the mitigating measures described in the Environmental Management Plan that will protect water resources, and are not contained within this docket.

m. The applicant shall be responsible for the operation of the project facilities in accordance with a "Plan of Operation for the Merrill Creek Reservoir," which will be developed by the applicant, and approved by the Executive Director of the DRBC in a manner that will insure compliance with all streamflow and use limitations and will conform with the conditions stated herein. Thereafter, the Executive Director may modify the "Plan of Operation for the Merrill Creek Reservoir," at any time a review of the hydrologic or hydraulic data and/or any other information indicates such action is necessary.

n. Nothing herein shall be construed to exempt the project sponsor from obtaining all necessary permits and approvals from other State, Federal, or local government agencies having jurisdiction over this project.

o. The Commission reserves the right to reopen this docket at any time, and to reconsider this decision and any and all conditions imposed hereunder in light of further information developed by, or decisions rendered in, pending or future proceedings conducted by other State and Federal agencies. The Commission may at any time modify existing conditions, or impose additional conditions, upon the operation of this facility to reflect new or changed information or to conform to requirements imposed on the project by other agencies.

BY THE COMMISSION

DATED: May 23, 1990

TABLE A (Revised)  
 "Designated Units"  
 for Merrill Creek Reservoir Project

<u>Sub Basin</u>	<u>Station</u>	<u>1st Year of Operation</u>	<u>Relative Effect Factor</u>
2	Portland #1	1958	1
2	Portland #2	1962	1
2	Martins Cr. #1	1954	1
2	Martins Cr. #2	1956	1
2	Martins Cr. #3	1975	1
2	Martins Cr. #4	1977	1
4	Gilbert #1 & #2	1930	1
4	Gilbert #3	1949	1
4	Gilbert #8	1976	1
5	Delaware #7	1953	1
5	Delaware #8	1953	1
5	Schuylkill #1	1958	1
5	Eddystone #1	1960	0.84
5	Eddystone #2	1960	0.84
5	Eddystone #3	1974	0.84
5	Eddystone #4	1977	0.84
6	Titus #1	1951	1
6	Titus #2	1951	1
6	Titus #3	1953	1
6	Limerick #1	1986	1
6	Limerick #2	1990	1
6	Cromby #1	1954	1
6	Cromby #2	1955	1
7	Mercer #1	1960	1
7	Mercer #2	1961	1
7	Burlington #7	1955	1
8	Edge Moor #3	1954	0.59
8	Edge Moor #4	1966	0.59
8	Edge Moor #5	1973	0.59
9	Deepwater #1	1958	0.51
9	Deepwater #3	1930	0.51
9	Deepwater #4	1930	0.51
9	Deepwater #6	1954	0.51
9	Hope Creek #1	1986	0.18
9	Salem #1	1977	0.18
9	Salem #2	1981	0.18

Table 8

## Merrill Creek Reservoir--Alternative Filling Schedule

Seven-day average location of "salt front," <sup>a</sup> River-mile (1)	Delaware River flow at Trenton, cfs (2)	Maximum number of pumps <sup>b</sup>		
		Dec.-Mar. (3)	Apr.-Jun. (4)	Jul.-Nov. (5)
---	Less than 3,072	0 <sup>c</sup>	0 <sup>c</sup>	0 <sup>c</sup>
Upstream of R.M. 92.5	---	0 <sup>d</sup>	0 <sup>d</sup>	0 <sup>d</sup>
R.M. 92.5 to R.M. 87.0	3,072 to 3,144	1	1	0
R.M. 92.5 to R.M. 87.0	3,145 to 4,000	2	1	0
R.M. 92.5 to R.M. 87.0	4,001 and up	3	3	2
R.M. 87.0 to R.M. 82.9	3,072 to 3,144	1	1	1
R.M. 87.0 to R.M. 82.9	3,145 to 3,216	2	2	1
R.M. 87.0 to R.M. 82.9	3,217 to 4,000	3	2	1
R.M. 87.0 to R.M. 82.9	4,001 and up	3	3	2
Seaward of R.M. 82.9	3,072 to 3,144	1	1	1
Seaward of R.M. 82.9	3,145 to 3,216	2	2	2
Seaward of R.M. 82.9	3,217 to 4,000	3	2	2
Seaward of R.M. 82.9	4,001 and up	3	3	3

<sup>a</sup> Measured in statute miles along the navigation channel from the mouth of Delaware Bay. The "salt front" is defined as the 250-mg/l isochlor.

<sup>b</sup> Pumping rate, based on rated pump capacity for a dynamic head of 775 feet, is 72 cfs for one pump, 145 cfs for two pumps, and 217 cfs for three pumps.

<sup>c</sup> No pumping--except for maintenance purposes--is allowed regardless of salt-front location.

<sup>d</sup> No pumping--except for maintenance purposes--is allowed regardless of flow at Trenton.