



CONNECTICUT DEPARTMENT OF ENVIRONMENTAL PROTECTION
79 Elm Street, Hartford, CT 06106

CONNECTICUT'S NITROGEN CONTROL PROGRAM

October 2005

Gina McCarthy, Commissioner

GENERAL PERMIT FOR NITROGEN DISCHARGES and Nitrogen Credit Exchange Program

Background

The Connecticut Department of Environmental Protection (CT DEP), in cooperation with New York State Department of Environmental Conservation (NYSDEC) and the federal EPA, has been investigating water quality problems in Long Island Sound through the National Estuary Program's Long Island Sound Study (LISS). Through those efforts, nitrogen has been identified as the primary pollutant causing low dissolved oxygen (DO) conditions, or *hypoxia*, that occur throughout much of the Sound's bottom waters each summer. Nitrogen fuels the growth of algae in the Sound, which eventually decays, consuming oxygen in the process. There is enough nitrogen added by human activity to cause severe hypoxia problems each summer, often with DO falling below 2 mg/l.

To address this important water quality problem, CTDEP and NYSDEC submitted a Total Maximum Daily Load (TMDL) analysis to EPA that specified how much nitrogen needs to be removed from the wastestream to meet state water quality standards. EPA approved the TMDL on April 3, 2001 in accordance with Section 303(d) of the federal Clean Water Act, providing the foundation for the nitrogen wasteload allocation (WLA) to be fully implemented by 2014.

The TMDL also left open the option for nitrogen trading among sources as a means for attaining the Sound-wide nitrogen reduction requirement, recognizing the significant cost savings that could be achieved through trading. In response, the Connecticut General Assembly passed, and the Governor signed, CGS 22a-521-527 in June 2001. The legislation established the framework for a Nitrogen Credit Exchange Program to be directed by a Nitrogen Credit Advisory Board. A key component of the Program is a General Permit for Nitrogen to include all participating Publicly Owned Treatment Works (POTWs). The General Permit is necessary to establish annual nitrogen removal limits

and set monitoring and reporting protocols.

The General Permit for Nitrogen Discharges was originally issued and has been in effect since January 2, 2002. The General Permit and Nitrogen Credit Exchange Program have provided a successful program for the reduction of nitrogen into Long Island Sound from 79 publicly owned treatment works in Connecticut. The program to date has removed 10,386 equivalent pounds of nitrogen per day from 29 facilities that have completed nitrogen removal by the end of 2004.

Permit Re-issuance

The re-issuance of the General Permit will establish annual limits for nitrogen discharged from each of the 79 facilities covered by the permit for the years 2006 through 2010 and a final limit to be achieved in 2014. Limits for individual facilities are listed in Appendix 1 of the General Permit. The re-issuance of the General Permit is necessary to allow facilities to participate in the Nitrogen Credit Exchange Program, thereby reducing the overall cost of removing nitrogen discharged to Long Island Sound as mandated by the TMDL.

The Department is proposing to reissue the current General Permit one year in advance of its scheduled expiration date. The early re-issuance is necessary to maintain the balance between the number of credits exchanged between municipal buyers and sellers of nitrogen credits so that the program will continue to be revenue neutral. Due to the limited availability of Clean Water Funds, the pace of new treatment facility construction for nitrogen removal has been substantially less than was projected when the original General Permit was issued in 2002. The annual permit limits that are being proposed in the revisions to the General Permit include an upward adjustment for the year 2006 based on a more realistic projection of expected performance. In order to insure that the final limit will be achieved on or before 2014, the General Permit limits for the years

2007 through 2010 anticipate maintaining a uniform rate of reduction for the years 2007 through 2010. Maintaining that same rate of annual reduction for the years 2011 through 2014 will result in achieving the final limit established in the TMDL in 2014.

Achieving the annual reductions necessary to meet the TMDL goals reflected in the General Permit limits is contingent on successfully completing the projected future projects that are now in planning and design. The changes to the re-issued permit allow for a more uniform reduction over the next five years but ultimately arrive at the same final limit in 2014.

Coverage

The permit regulates the discharge of total nitrogen from each of the 79 Publicly Owned Treatment Works (POTW) in the General Permit. The reissued permit will be in effect from January 1, 2006 through December 31, 2010. These facilities, in aggregate, must reduce the annual loading of total nitrogen to Long Island Sound by approximately 64% by 2014 in order to achieve the final wasteload allocation established in the TMDL.

Limits and Compliance

The following provides an overview of the provisions of Section 4 of the General Permit regarding how compliance will be determined. Permit language taken from the General Permit appears in *Italics*.

(a) Discharge Limits

- (1) *Annual discharge limits applicable to each POTW are set forth in Appendix 1, which is incorporated herein in its entirety, as part of this general permit.*
- (2) *Each permittee shall limit the discharge of nitrogen to the annual discharge limits set forth in Appendix 1, except as set forth in paragraph (b)(1)(b) of this Section.*

The annual limits for each facility in Appendix 1 are expressed in terms of pounds per day and represent the allocated “end-of-pipe” loading for each facility. These limits will be revised during the term of the permit as new information becomes available regarding progress towards achieving the final aggregate wasteload allocation established in the TMDL for Long Island Sound. Modification of the limits will provide an opportunity for public participation and comment.

(b) Compliance During Term of Permit

- (1) *A permittee shall be in compliance with the annual discharge limits of this general permit if:*
 - (a) *the POTW's annual mass loading of total nitrogen is less than or equal to the discharge limit set forth in Appendix 1;*
or
 - (b) *the permittee has secured equivalent nitrogen credits equal to the amount the POTW exceeded the annual discharge limit set forth in Appendix 1 in accordance with the Nitrogen Credit Exchange Program and P.A. 01-180.*

Facilities that discharge less total nitrogen than the limit established in the General Permit will be considered to be in compliance with the General Permit and be credited for the amount of nitrogen removed beyond the limit. The DEP will purchase all equivalent nitrogen credits generated by facilities that achieve compliance in this way in accordance with the Nitrogen Credit Trading Program established by CGS 22a--521-527.

Facilities may also achieve compliance by purchasing equivalent nitrogen credits from the state. DEP is obligated under the terms of CGS 22a-521-527 to sell municipalities sufficient credits to achieve compliance. The number of equivalent nitrogen credits required to achieve compliance is calculated by subtracting the annual mass loading of nitrogen discharged by the facility from the annual mass loading limit for that facility and multiplying the result by the equivalency factor for the facility.

Cost of Equivalent Nitrogen Credits

The price of an equivalent nitrogen credit is established for each year that the program has been in effect from 2002. The Nitrogen Credit Advisory Board for the year 2004 has established the cost of \$1.90 per equivalent nitrogen credit. This a composite cost of capital construction costs and operation and maintenance costs of 29 nitrogen removal projects funded under the Clean Water Fund in Connecticut operating in the calendar year 2004. The project costs along with the total amount of nitrogen removed from the 79 permitted facilities results in the cost of an equivalent nitrogen credit of \$1.90 for the calendar year 2004. DEP notifies each individual facility in writing of their equivalent nitrogen credit balance by March 31st of each year. Facilities

must purchase the equivalent nitrogen credits needed to achieve a zero equivalent nitrogen credit balance by July 31st to remain in compliance with the permit.

The attached Table *LIS Total Nitrogen Credit Exchange Final Balance - 2004* identifies the facilities that will be selling nitrogen credits and the facilities that will be purchasing nitrogen credits based on the equivalent nitrogen credit cost of \$1.90 per credit. Many facilities that will be selling credits have completed significant improvements to their treatment processes to remove nitrogen. The facilities with a star have completed nitrogen removal improvements funded through the Clean Water Fund.

For more information...

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