



Connecticut Department of Environmental Protection

Gina McCarthy, Commissioner



Stratford Water Pollution Control Facility

Report of the Nitrogen Credit Advisory Board for Calendar Year 2006 To The Joint Standing Environment Committee Of The General Assembly

December 12, 2007

79 Elm Street
Hartford, CT 06106-5127

**REPORT OF THE NITROGEN
CREDIT ADVISORY BOARD FOR CALENDAR YEAR 2006
TO THE JOINT STANDING ENVIRONMENT COMMITTEE
OF THE GENERAL ASSEMBLY**

**Concerning the
NITROGEN CREDIT EXCHANGE PROGRAM**

**As required by
Section 22a-523(c) of the
Connecticut General Statutes**

December 12, 2007

Cover photograph courtesy of Camp, Dresser & McKee, Inc

Concerning the Nitrogen Credit Exchange Program

As required by Section 22a-523(c) of the Connecticut General Statutes

This report has been prepared by the Nitrogen Credit Advisory Board and is respectfully submitted to the Joint Standing Environment Committee of the General Assembly pursuant to the requirement of Section 22a-523(c) Connecticut General Statutes. Such section requires that the Nitrogen Credit Advisory Board submit to the Joint Standing Environment Committee of the General Assembly a report that addresses issues associated with the implementation of the Nitrogen Credit Exchange Program. This report covers the period from January 1, 2006 to December 31, 2006.

This report provides a summary of the technical progress and financial requirements that the Nitrogen Credit Advisory Board deems necessary to achieve progress in this important program in reducing nitrogen loads to Long Island Sound. The continued success of this program is only possible if adequate funding is provided through the Clean Water Fund each year to construct new projects and through the development and application of innovative approaches and management techniques to meet nutrient reduction goals for Long Island Sound.

Executive Summary

In accordance with Sec 22a-523(c) CGS, the Nitrogen Credit Advisory Board submits this 2007 Annual Report of the Nitrogen Credit Advisory Board on the progress of the Nitrogen Credit Exchange for the calendar year 2006. Major accomplishments and activities relative to the 2006 program include:

- All 79 municipalities regulated under the General Permit for Nitrogen Discharges cooperated fully in implementing the program. The nitrogen general permit limit for 2006 was 13,280 equalized pounds of nitrogen per day. Treatment plant performance for 2006 was 14,429 equalized pounds per day. This is the second year of the program where more nitrogen was discharged than targeted in the permit.
- The Nitrogen Credit Advisory Board recommended a value of \$3.40 per equalized pound of nitrogen in 2006. The price of a credit in 2005 was \$2.11.
- In 2006 a total of 46 facilities were required to purchase credits in order to remain in compliance with the General Permit. Municipalities purchasing credits contributed a total of \$3,828,114. Thirty-three facilities received payments totaling \$2,394,956 from the sale of nitrogen credits. Hence the Nitrogen Credit Exchange netted \$1,433,158 from credit purchases and sales in 2006. In 2005 there were more buyers (50) than in 2006.
- Clean Water Fund financing available in calendar year 2006 was limited and delayed the initiation of construction of several nitrogen removal projects.
- Three project facilities were completed in 2006 (Stamford, North Haven and Wallingford). Stamford is a key project for the program because the equalized pounds discharged are very high, and its nitrogen equalization factor is 1.0, the highest possible (due to its proximity to the area of Long Island Sound with the lowest dissolved oxygen). Stamford is removing large amounts of nitrogen and is discharging much less than targeted in the permit.
- Projections of project construction schedules indicate that the 2014 final TMDL limit may not be met as a matter of course. This will require the Department, with the assistance of the NCAB, to analyze changes to the program to assure compliance with the 2014 limit.
- The State must re-prioritize the Clean Water Fund in order of expenditure of state bonding capacity if the 20 year needs of Clean Water infrastructure projects are to be met, including attainment of the 2014 nitrogen reduction goal.

I. Introduction

Background

Long Island Sound's (LIS) most pressing water quality problem is caused by over enrichment of nutrients, specifically nitrogen, that leads to greatly reduced levels of dissolved oxygen in the bottom waters of western LIS. The overload of nitrogen fuels excessive growth of algae, which eventually dies, sinks to the bottom and decays. During decay, oxygen is consumed and the dissolved oxygen in the water falls to levels well below those allowable in State Water Quality Standards. Low oxygen levels, or "hypoxia" typically occur during the July through September period. These conditions are inadequate to support healthy populations of fish and shellfish because they disrupt the feeding, growth and reproduction of nearly all forms of aquatic life. Primary sources of nitrogen include municipal wastewater treatment plant discharges, atmospheric deposition and runoff from urban, suburban and agricultural areas.

The federal Clean Water Act requires that the State establish Total Maximum Daily Loads (TMDLs) for all waterbodies that do not meet minimum State Water Quality Standards, such as Long Island Sound. Once the State establishes a TMDL, federal law requires that the TMDL be reviewed and approved by the federal Environmental Protection Agency (EPA). In April 2001, EPA approved Connecticut and New York's jointly submitted TMDL to address the impairment to Long Island Sound water quality that results from excessive nitrogen loading. The TMDL establishes the maximum loading for nitrogen Long Island Sound can assimilate without causing impaired water quality, apportions that maximum loading among sources, and lays out a plan to achieve the loading reductions necessary to meet Water Quality Standards.

In the TMDL, discharges from municipal sewage treatment plants (STPs), stormwater runoff and atmospheric deposition, the primary sources of nitrogen enrichment in LIS, are targeted for control. The TMDL requires the two states by 2014, to achieve a 58.5% collective reduction of nitrogen loading from point discharges and urban and agricultural runoff sources to LIS from an established baseline. A 64% reduction goal was set for Connecticut STPs through a wasteload allocation process.

Nitrogen "trading" was identified as a mechanism for cost-effectively attaining the aggregate goal for Connecticut STPs. Public Act 01-180, codified in the Connecticut General Statutes in Sections 22a-521 through 527, established a Nitrogen Credit Exchange (NCE) overseen by a Nitrogen Credit Advisory Board (NCAB – Appendix A), and authorized issuance of a Nitrogen General Permit (NGP). Collectively, the NGP, the NCE and the NCAB form the foundation for the nitrogen-trading program instituted by Connecticut in 2002.

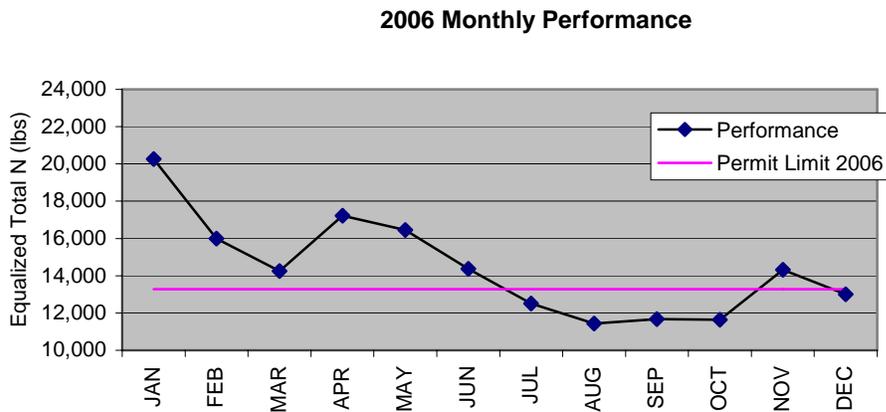
2006 Performance of the Nitrogen Credit Exchange

The aggregate nitrogen discharge for the 79 treatment facilities participating at the NCE was 14,429 equalized pounds per day, which exceeded the aggregate permit limit. The intense rainfalls in January, April and May were one of the primary factors having an adverse impact on nitrogen removal in 2006. The effect can be seen in Figure 1, as the monthly average nitrogen loadings were the highest during those three months.

During the summer and part of the fall (July through October), the aggregate nitrogen load from the 79 municipal STPs regulated under the general permit attained the discharge requirements of the permit. The drier and warmer weather that occurred during the summer and fall of 2006 enhanced nitrogen removal.

A second effect on 2006 nitrogen removal is related to the level of funding available for the Clean Water Fund. The general permit limits are based on the anticipated increase in the ability of Connecticut wastewater treatment systems to remove additional nitrogen, which is a direct result of the number of nitrogen removal upgrade projects that become operational during the year. However, in 2006 only three plants came on line with nitrogen process upgrades. More projects per year will need to be implemented if the final 2014 permit limit is to be met on schedule.

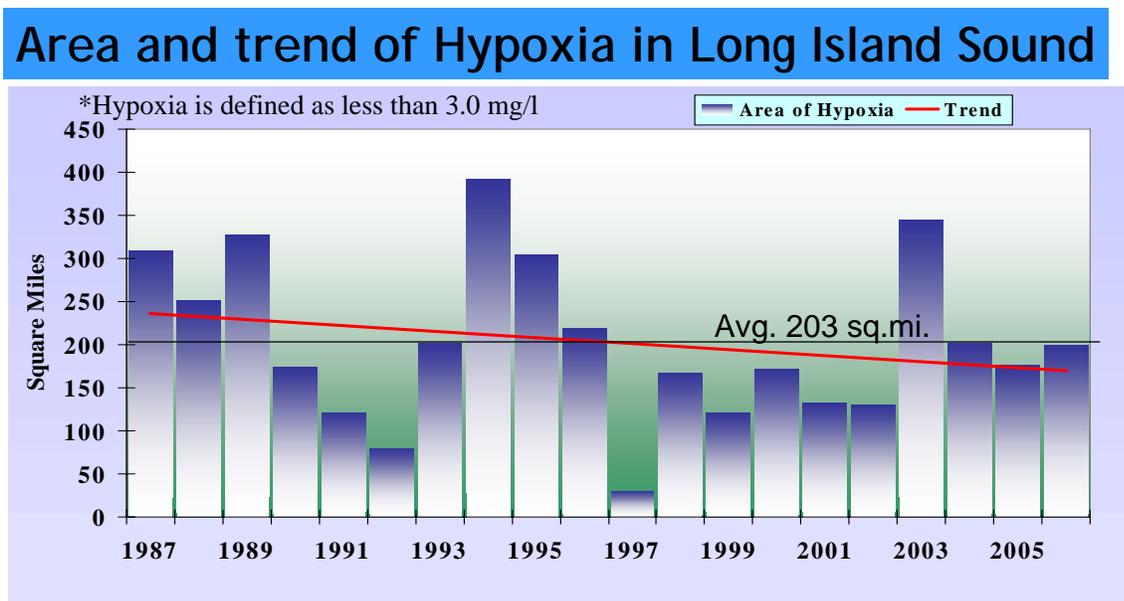
Figure 1. Monthly aggregate performance of 79 facilities during 2006



Condition of Long Island Sound

As highlighted in this report, nitrogen trading has led to measurable reductions in Connecticut’s nitrogen load to the Sound. Although signs of improvement in hypoxia are evident, more reductions are needed to meet management goals and attain a healthy Long Island Sound.

Figure 2. Area and trend of hypoxia in Long Island Sound, 1987-2006



One measure of improvement is the area affected by hypoxia each summer (Figure 2). Although annual variation is large, subject to changing weather conditions that affect the severity of hypoxia each year, there is a downward trend in hypoxic area. Over the 20 years of monitoring, the affected

area has averaged 203 square miles. However, for the last ten years, only one year's event (2003) exceeded the 20-year average area of hypoxia.

II. The 2006 Nitrogen Credit Exchange

Credit Price

A major task of the Nitrogen Credit Advisory Board (NCAB) each year is establishing the value, or price, of an equalized nitrogen credit. Each year, the NCAB proposes the annual value for equalized nitrogen credits to the Commissioner of the Department of Environmental Protection (DEP). The Board calculates this value by dividing the total annual project costs by the reduction in equalized pounds of nitrogen. The statute further identifies the total project cost as: 1) capital expenditures for construction of nitrogen removal facilities and 2) ongoing operation and maintenance costs for nitrogen removal treatment.

Therefore, the cost of an equalized credit is:

Capital Costs + Operational Costs / Total amount of equalized nitrogen reduced from project facilities = the value of an equalized credit

A "Nitrogen Removal Project" is defined as any alteration of the physical structure of a wastewater treatment facility specifically constructed to remove nitrogen that was financed by the Clean Water Fund. A "Project Facility" is further defined as any facility that was fully operational on January 1 of the trading year. Under this definition, 32 facilities were considered to be Project Facilities during 2006 (see Attachments C and D).

"Capital Costs" were established by the Board as the annual Clean Water Fund repayment amount associated with construction of nitrogen treatment facilities as set forth in the loan agreement between the municipality and DEP. Financing derived from grants to municipalities are not considered to be a capital cost. Using this procedure, the Board established the annual capital cost for nitrogen treatment in 2006 at \$5,146,294 (Attachment D). This figure represents the annual interest and repayment of principal on the 2% loans for nitrogen removal processes.

"Operation and maintenance costs" were estimated by means of a survey sent to all Project Facilities. Department staff reviewed all survey data for consistency and reasonableness and an estimate of \$7,420,189 was adopted by the Board as the annual operation and maintenance costs for nitrogen removal in 2006. Combining capital and operation and maintenance cost yielded a total cost for nitrogen removal in 2006 of \$12,566,483 (Attachment D). Operation and maintenance costs increased substantially in 2006 because of a 30% increase in electricity and an increase in the cost of chemicals such as methanol. For example the Stamford plant had a 90% increase in methanol used in 2006.

The reduction in equalized pounds of nitrogen was calculated by subtracting the actual end-of-pipe pounds of nitrogen discharged by each of the Project Facilities from the "baseline" loading established for the facility in the TMDL for Long Island Sound. The baseline loading represents the loading of nitrogen each facility would have discharged if no nitrogen treatment were provided. Load reductions for each facility were multiplied by the equalization factor for the facility (converting the pounds reduced to equalized pounds reduced) and the statewide reduction calculated by summing the equalized pounds reduced for all Project Facilities. Using this procedure, a total of 10,115.67 equalized pounds per day of nitrogen was reduced by the 32 project facilities that were on line in 2006 (See Attachment D). This calculates to an annual nitrogen load reduction of 3,692,220 equalized pounds.

In January 2007, The Board formally submitted a recommendation to the Commissioner that she establish the value of an equalized nitrogen credit at \$3.40 for trading in 2006 based on dividing the

Total Project Cost of \$12,566,483 by 3,692,220 pounds of equalized nitrogen removed during the year. The Commissioner accepted this recommendation and issued a draft ruling pursuant to CGS Section 22a-527. No municipality petitioned for a review of the Commissioner's draft ruling during the statutory 15-day review period and the draft ruling became final establishing the value of an equalized nitrogen credit at \$3.40 for 2006.

Numbers of Credits Traded and Final Balances

In 2006 a total of 46 facilities were required to purchase credits in order to remain in compliance with the General Permit. Municipalities purchasing credits contributed a total of \$3,828,114. Thirty-three facilities received payments totaling \$2,394,956 from the sale nitrogen credits.

Because less nitrogen was removed than required in the nitrogen general permit in 2006, payments from credit purchasers are greater than monies paid out by sellers. (Attachment C).

Table 1 Price of Credit

Year	Credit Price	Credits Bought by the NCE	Credits Sold by the NCE	Surpluses/ Deficits ⁽¹⁾
2002	\$1.65	\$2,757,323	\$1,317,223	\$1,440,100
2003	\$2.12	\$2,429,419	\$2,116,758	\$312,661
2004	\$1.90	\$2,659,804	\$1,786,736	\$873,068
2005	\$2.11	\$1,315,392	\$2,466,725	(\$1,151,333)
2006	\$3.40	\$2,394,956	\$3,828,114	(\$1,433,158)

⁽¹⁾Surplus= surplus value of credits purchased by the NCE. Deficits = excess value of credits sold by the NCE.

Credit prices have risen from \$1.65 to \$3.40 over the five years of operation of the NCE (Table 1). From 2002 through 2004, there were surpluses of credits purchased by the NCE, but during the last two years, the NCE ran deficits of \$1,151,333 in 2005 and \$1,433,158 in 2006 as overall facilities performance based on projections did not meet the nitrogen general permit targets. Fluctuations above and below the aggregate limits are expected and acceptable in the trading program provided the conditions of the TMDL are met (See Section IV).

III. Finances

Clean Water Fund Advisory Work Group

The difficult process of adopting the FY06 and FY07 Priority List due to limited clean water funds (CWF), led Governor M. Jodi Rell to request that Commissioner Gina McCarthy convene a work group to “evaluate the Clean Water Fund with due consideration for the potential impact to the environment and the possible ramifications in the State.” Therefore, a Clean Water Fund Advisory Work Group (CWFAWG) was convened in 2006 to evaluate creative options for the CWF to provide a sustainable level of funding to assist municipalities in addressing known and emerging water quality issues and the enhancement of wastewater infrastructure. Their evaluation gave due consideration to nitrogen removal needs and attainment of the 2014 TMDL goal for nitrogen.

The CWFAWG published its final report in February 2007 titled “The Clean Water Fund Dilemma: Increasing Demands with Diminishing Fiscal Resources”

http://www.ct.gov/dep/lib/dep/water/municipal_wastewater/cwf_a_g_report.pdf

The consensus of the CWFAWG was that the CWF program was not broken and did not need major statutory changes. The CWF program works exceptionally well, and will continue to do so, when properly funded. The “problem” needing attention was not the details of the program, but rather the priority of the CWF program as measured against all demands for state bonding. Prior to any statutory

changes being recommended, the Advisory Work Group determined that the state needs to re-invest in the CWF and that re-prioritizing of the bonding program should be the effort conducted during the 2007 legislative session.

The most significant conclusions from the CWFAWG report were:

1. The CWF has the capacity to issue revenue bonds for loan financing of up to \$90 million per year through 2021 without additional state general obligation bond authority. This capacity is from current assets of over \$550 million.
2. Additional general obligation bond authority would be necessary to provide grants for new projects (CSO, denitrification, small community, etc.) financed each year. Best estimates for the next five years are general obligation needs of \$130 million/year.
3. Massive demands remain for wastewater infrastructure, now approaching \$5 billion. Approximately half of this demand or \$2 billion is necessary for combined sewer overflow correction in five of the state's oldest and poorest cities within the next 15 years. The cost for needed upgrades to wastewater treatment facilities during the period 2008-2014 is \$1.022 billion, of which \$456 million is for secondary upgrades and \$566 million is for denitrification upgrades.
4. Lack of adequate state funding drives up inflationary costs, saps resources, and shifts responsibility onto the municipalities with further reliance on the property tax as the revenue source.
5. Lack of adequate subsidized funding results in the overall degeneration of publicly owned facilities and the corresponding ongoing, unaddressed threat to the environment and public health.
6. Two billion gallons per year of combined sewage is discharged to Connecticut rivers and harbors from combined sewers with all of its associated public health concerns and environmental impacts.
7. The achievement of water quality goals for Long Island Sound by 2014 will not be met without a significant increase in CWF funding.
8. Emerging water quality issues, such as phosphorus control and pharmaceuticals/personal care products, will not be adequately addressed without a properly financed CWF.

In general, the CWFAWG concluded that the state must re-prioritize its obligations and place the CWF much higher in the order of expenditure of the state bonding capacity if 20-year needs for clean water infrastructure projects are to be met.

Outlook for FY08 and FY09

In October 2007 the Connecticut Legislature passed Senate Bill 1502 (the bond implementation package). Shortly thereafter, Governor M. Jodi Rell signed the bill into law. The bonding authorization for the Clean Water Fund was very favorable. It includes \$90 million in General Obligation bonds for each of FY08 and FY09 and \$235 million and \$180 million for FY08 and FY09 respectively in revenue bond authority actions.

This level of new funding authorizations for the CWF program will be sufficient to finalize the funding of the Milford Housatonic, Stratford and Meriden denitrification plants as well as fund additional denitrification projects in up to six additional municipalities. As the FY08 and FY09 Priority List have not been adopted yet, the exact denitrification projects to be funded have not been finalized.

While up to six additional projects is good news, it must be tempered by the knowledge that an additional five denitrification projects will be ready to start construction in FY09 for which funding will not be available.

Use of NCE Surplus Funds

The total amount of surplus funds created from the purchase and sale of equivalent nitrogen credits in 2005 was \$1,151,333. As noted above, 2006 was the second year that the limit in the general permit has been exceeded. According to Sec. 22a-524(b)(11) of the Connecticut General Statutes, the Commissioner, in consultation with the NCAB, shall: "Establish accounts of funds created from the purchase and sale of equivalent nitrogen credits to be used for administration of the nitrogen credit exchange program and which may be used for nitrogen removal projects, habitat restoration projects and research". Further, in Sec. 22a-524(b)(12) of the Connecticut General Statutes, the Commissioner, in consultation with the NCAB, shall: "Established any other policies or procedures the commissioner may deem necessary to carry out the nitrogen credit exchange program; and Sec. 22a-524(b)(13) established a technical assistance program to educate and assist municipalities in implementing the nitrogen credit exchange program".

During 2006, the NCAB recommended that some of the surplus funds be used for training and providing technical assistance. New England Interstate Water Pollution Control Commission (NEIWPCC) has been retained to work with CT DEP to assist the facilities in reliably meeting their nitrogen removal goals. NEIWPCC will provide the assistance through trainings for operators on the topics of nitrogen removal, the Biological Nitrogen Removal process, and better management of wet weather/cold weather conditions that have an adverse impact on nitrogen removal. This will help ensure that the maximum benefit from existing upgrades is attained.

The Advisory Board also recommended the use of surplus funds to acquire a membership in the Water Environment Research Foundation (WERF). WERF keeps members informed on the latest technology, technical discussion groups, seminars, and workshops relevant to treatment plant operations and nitrogen removal.

The Advisory Board continues to explore other ideas for the use of the surplus funds for training and improvements in treatment plants to ensure that the program will achieve the TMDL limit.

Projects on Line/ Grant Loan Portion

Three additional nitrogen removal projects became project facilities during the 2006 trading period at Stamford, North Haven and Wallingford at a total grant and loan cost of \$100.5 million (Attachment E). There are seven facilities that are expected to finish construction in 2007 (Cheshire, East Hartford, Shelton, Simsbury, Suffield, Westport and Winsted). These projects have a total cost of \$93 million with \$28.8 million going towards the nitrogen removal capital portion of the upgrades. A complete list of nitrogen removal projects that have been completed or currently approved for funding by the Clean Water Fund is provided as Attachment E.

IV. Progress towards TMDL goal

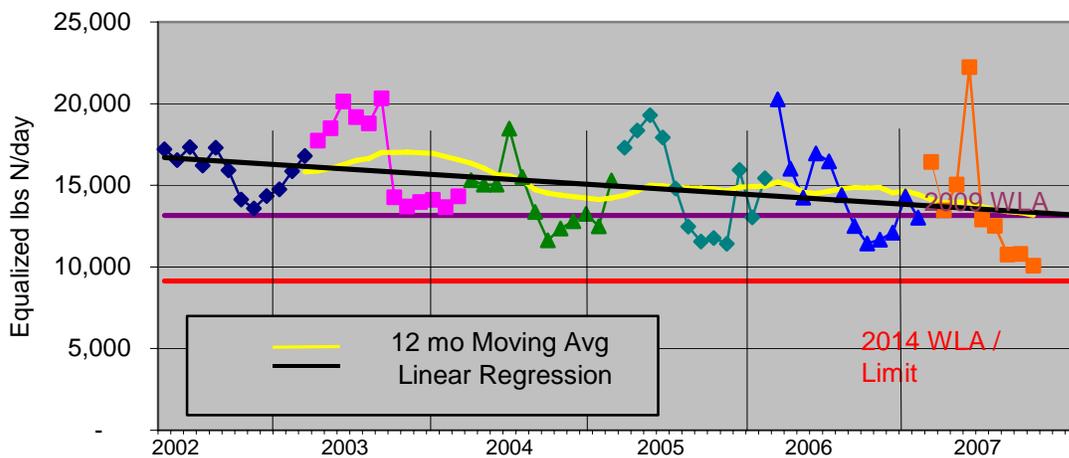
Nitrogen Loading Trend and Scheduled Projects

Despite the effect of intense storms, wet weather, and cold periods that impair nitrogen removal capability at municipal facilities and the financial limitations that have reduced the number of nitrogen removal projects below anticipated levels, steady progress has been made towards achieving the 2009 and 2014 TMDL allocations.

Data reported for the last five and one half years indicate that by 2009 the aggregate nitrogen removal performance will be close to the 2009 permit limit of 13,149 equalized pounds per day. The twelve-month rolling nitrogen load average for the 2007 time period has been 13,824 equalized pounds

(yellow line in Figure 3). Coupling this with the expectation that seven nitrogen removal projects will be coming on line in 2007 and one more plant (Hartford) is expected to complete an interim upgrade in 2008, should allow attainment of the 2009 limit. Predicted nitrogen discharges are expected to be 12,955 equalized pounds per day within the next two years, below the 2009 limit of 13,149. The principal factor moderating the rate of progress in reducing nitrogen loads is the availability of financing through the Clean Water Fund to complete nitrogen removal upgrades to municipal sewage treatment facilities. The improved performance necessary to achieve future limits will require construction of upgraded treatment technology at a number of facilities in Connecticut (See Attachment E). The final waste-load allocation (WLA) limit to be achieved in 2014 for nitrogen is 9,166 equalized pound per day (Orange line in Figure 3).

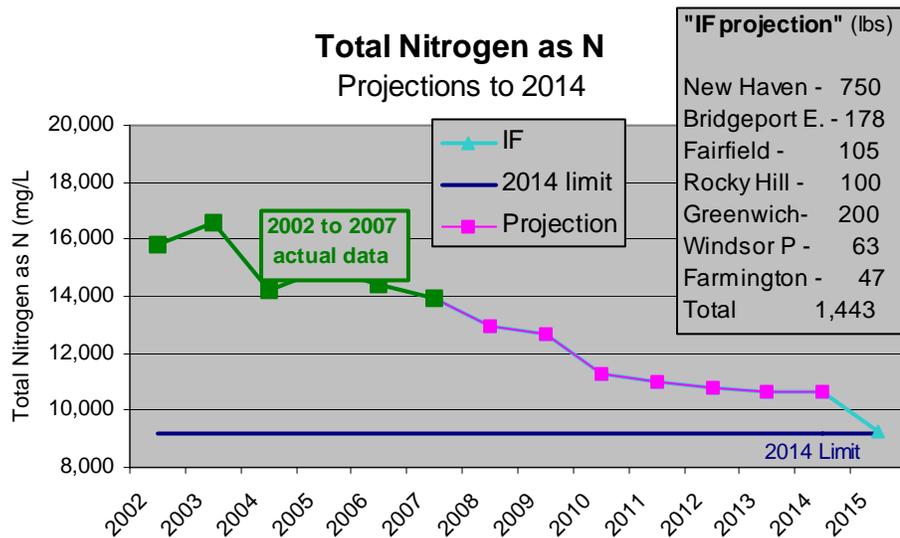
Figure 3. Monthly average total nitrogen loading to Long Island Sound, 2002-2007



Meeting the 2014 Wasteload Allocation

The Department has made projections to see how the 2014 target load allocation could be attained (Figure 4). The seven project facilities ready to finish construction in 2007 (Cheshire, East Hartford, Shelton, Simsbury, Suffield, Westport, Winsted) will be able to remove approximately 511 equalized pounds of nitrogen by 2007. This will bring the average annual equalized nitrogen load down to about 13,500 pounds per day. By 2008 the state will be discharging 12,955 with the expectation that the Hartford Metropolitan District Commission (MDC) plant will be on line with interim upgrade.

Figure 4. Projections of total equalized nitrogen loads compared to the 2014 limit



Immediate Denitrification Project in FY08 and FY09

Three treatment plant upgrades, which include denitrification capabilities, are proceeding with construction using local funding under a formal deviation from the Commissioner and will be in operation in either 2009 or 2010 (Milford Beaver Brook, Plainville and Glastonbury). Deviations have been used to allow facilities to move forward without CWF financing while maintaining eligibility. Deviations provide no guarantees that CWF financing will be available in the future, but with the inflation of construction costs, some municipalities expect to be ahead financially even if CWF monies do not become available. These three projects will remove an additional

Five treatment plant upgrades, all of which include denitrification capabilities, are currently in construction with Clean Water Fund financing including Milford Housatonic, Stratford, Meriden, Southington and Danbury. The estimated equivalent pounds of nitrogen to be removed in 2010 will be equivalent to 1,392 equivalent pounds per day.

The only new interim denitrification project requesting funding in FY08 and FY09 is the town of Vernon. Interim projects have been used as a low cost alternative to a full nitrogen removal project, with the expectation that a full project will follow.

Other potentially fundable denitrification projects on the FY8 and FY09 priority list include Ansonia, Norwalk and West Haven.

Potential Denitrification Project Between 2010 and 2014

The DEP is aware of developing denitrification projects in a number of other municipalities other than those identified above. Those include but may not be limited to Windham, South Windsor, New Milford, Stafford, Putnam, Mattabassett District, Manchester and Norwich.

Achievement of the 2014 Permit limits

Even with all of the identified projects listed above for construction in FY2008 through 2014, it is anticipated that the 79 wastewater treatment facilities will discharge 10,700 equalized lbs of nitrogen. At that load, the facilities may not be in compliance with the equalized permit of 9,166 equalized pounds every year in 2014 (a shortfall of 1534 equalized pounds). This prediction is based on project

facilities that are going to be finished in 2014, but cannot account for variations in weather that can affect nitrogen removal operations.

The state recognizes that some municipalities are not planning to upgrade their facility immediately to individually comply with their 2014 permit for reasons that are generally market driven. They have assessed the predicted marginal costs of upgrading compared to purchasing credits and have determined that the cost of purchasing credits is still economically favorable. However, since a component of credit price is the cost of electricity and methanol, these facilities may choose to upgrade as prices rise and the cost of purchasing credits exceeds the perceived cost of the necessary upgrades.

Among those municipalities that the Department understands are not currently planning an upgrade to achieve their individual permit limit are New Haven, Bridgeport East, Greenwich, Fairfield, Rocky Hill, Windsor Poquonock and Farmington (Figure 4). The size of their nitrogen load and their equalization factors make them important contributors towards meeting the WLA. The Department has identified these municipalities as those with the highest equalized pounds of nitrogen yet to be removed. If all of these municipalities upgrade by 2014, the estimated total nitrogen reduction of 1,443 equalized pounds will be close to 2014 wasteload allocation (Figure 4). This level of progress is predicated on all seven of these municipalities implementing projects to remove nitrogen. Failure of any of these will mean that the state may not achieve the States limits by 2014.

Proposed Revisions to the Program

Since the facilities may not be able to comply with the Nitrogen General Permit and meet the nitrogen wasteload allocation under current project upgrade plans, some additional assessments and revisions to the program may be necessary. The Department and Nitrogen Credit Advisory Board members will work with municipalities that may need to host projects to help them understand the need to improve their facilities. The DEP and NCAB members will evaluate the potential for making market adjustments by adjusting the price of the nitrogen credit, for example. Strategies (either incentive or enforcement-based) may need to be developed to encourage municipalities with key projects to improve their facilities in a timely manner.

In the interim, technical assistance will be provided to the wastewater treatment operators to better manage wet and cold weather conditions that have an adverse impact on nitrogen removal (See Section III- Use of NCE Surplus Funds). This will help ensure that the maximum benefit from existing upgrades is attained.

Private Entity Trading

In 2006, CT DEP and the NCAB began to explore expansion of the nitrogen-trading program to include private entities. Public Act 06-82 amended Sec. 22a-522 and 526 of the CGS to provide economic incentives to private sector entities that discharge nitrogen into state waters through the existing NCE. To maintain the integrity of the existing NCE and not disrupt the ongoing system and general permit, and to ensure there was no use of public Clean Water Funds going to support private entity nitrogen removal activities, a sponsorship approach was developed. The conditions that apply are:

1. The private entity must have had an active discharge permit in effect prior to 1990 and discharge at least 20 lbs/day of nitrogen.
2. Applicants must be sponsored by a current municipal member of the NCE.
3. The municipality and the private entity enter into an agreement where the municipality will bring any generated credits for sale to the NCE.
4. A baseline load for the private entity must be established.

5. The private entity must have a nitrogen limit in their individual permit consistent with the requirements of the TMDL.
6. The private entity must monitor according to guidelines established in the general permit for the municipal participants.
7. Credits will be calculated and approved by the NCAB, and purchases made consistent with the approach and schedule used for the current membership.
8. Private entity credits will only be purchased if there is a demand (need to meet the aggregate load in the general permit) for those credits.
9. No private entity will be allowed to purchase credits to meet their individual permit limits for nitrogen.

V. Recommendations for statutory change

Until there is further assessment of the program, there is no recommendation to make any statutory changes.

VI. Attachments

- A. Nitrogen Credit Advisory Board Members and their Terms
- B. Total nitrogen Balance Sheet - Monthly Averages by plant 2006
- C. Nitrogen Exchange Balance Sheet 2006
- D. Total Annual Project Cost 2006
- E. Nitrogen Removal Projects Financed by the CWF through 2006
- F. Nitrogen Credit Advisory Board 2008 Meeting Schedule

Attachment A
LIST OF APPOINTEES

Name	Current Appointing Authority	Term	Term Expires
1. Dominick DiGangi Greater New Haven WPCA 345 East Shore Parkway New Haven, CT 06512	Martin M. Looney Senate Majority Leader	3 Years	November 2009
2. John Mengacci Under Secretary Office of Police Management 450 Capitol Avenue Hartford, CT 06106 Phone: (860) 418-6374	Robert M. Genuario Secretary Office of Policy and Management	No specific Term	
3. Robert Moore The MDC PO Box 800 555 Main St. Hartford, CT 06142-0800 Phone: 278-7850	Donald E. Williams, Jr. Senate President Pro Tem (Sullivan appointee)	3 year	November 2005 *
4. Betsey Wingfield Bureau Chief DEP 79 Elm St Hartford, CT 06016 Phone: (860) 424-3704	Gina McCarthy Commissioner Environmental Protection	No specific term	

5.	Sharon Dixon-Peay Office of the Treasurer 55 Elm Street Hartford, CT 06106 Phone: (860) 702-3134	Nappier Denise Secretary Office of the Treasurer	No specific Term	
6	Astrid T. Hanzalek 31 Abraham Terrace Suffield, CT 06078 Phone: (860) 668-2739	Larry F. Cafero House Minority Leader (Ward Appointee)	3 years	September 2010*
7.	Brian Armet Executive Director Mattabassett Director 245 Main Street Cromwell, CT 06416 Phone: (860) 635-5550	Christopher G. Donovan House Majority Leader (Pudlin Appointee)	3 years	June 2008 *
8.	Richard Cellar 83 Lawrence Road Fairfield, CT 06824-3039 Phone: (203) 255-5017	John McKinney Senate Minority Leader (DeLuca Appointee)	3 year	November 2005 *
9.	Carl Almquist Town of Groton WPCA 134 Groton Long Point Road Groton, CT 06340 - 4873 Phone: (860) 448-4083	M. Jodi Rell Governor	3 year	November 2007

10.	Jeanette Brown Stamford WPCF Harbor View Avenue Stamford, CT 06902 (203) 977-5809	Christopher G. Donovan House Majority Leader	3 years	November 2009
11.	William Norton, Director City of West Haven WPCA 355 Main Street West Haven, CT06516 (203) 937-3706	James A. Amann Speaker of the House	3 year	February 2008
12.	Vacant Senate Majority Leader	Martin M. Looney	3 years	

* Appointees remain active until removed by their appointees authority

Total Nitrogen Balance Sheet - Monthly Averages by Plant, 2006

Attachment B

	<u>Limit '06</u>	<u>JAN</u>	<u>FEB</u>	<u>MAR</u>	<u>APR</u>	<u>MAY</u>	<u>JUN</u>	<u>JUL</u>	<u>AUG</u>	<u>SEP</u>	<u>OCT</u>	<u>NOV</u>	<u>DEC</u>
ZONE: 1													
GROTON CITY WPCF	144	184	165	105	95	112	79	205	119	90	85	100	80
GROTON TOWN WPCF	223	610	454	528	502	584	574	417	375	335	351	503	407
P JEWETT CITY WPCF	22	9	12	11	12	25	9	6	4	6	9	10	10
KILLINGLY WPCF	191	179	255	173	189	276	187	142	78	45	72	82	145
P LEDYARD WPCF	11	7	10	13	3	5	7	4	4	6	7	9	11
MONTVILLE WPCF	171	67	97	88	128	130	119	79	71	71	97	105	118
P NEW LONDON WPCF	561	396	310	377	412	409	248	275	349	416	548	673	657
NORWICH WPCF	292	717	827	1147	1258	1301	1075	697	566	524	722	568	538
PLAINFIELD NORTH WPCF	50	113	107	354	119	127	100	71	48	65	105	129	95
PLAINFIELD VILLAGE	35	63	197	61	68	34	41	27	18	22	37	43	36
PUTNAM WPCF	77	248	214	204	196	217	186	151	175	181	249	241	201
SPRAGUE WPCF	11	17	22	23	23	25	28	13	26	28	21	18	16
STAFFORD SPRINGS WPCF	87	111	98	108	97	119	127	121	126	105	115	127	118
STONINGTON BOROUGH	20	45	37	34	51	43	45	35	50	28	29	26	25
STONINGTON MYSTIC WPCF	39	50	59	49	53	54	54	73	57	47	54	28	30
STONINGTON PAWCATUCK	35	34	29	23	26	25	23	16	14	16	26	36	26
THOMPSON WPCF	15	23	34	38	51	46	32	15	12	29	16	21	18
P UCONN WPCF	64	116	70	62	58	45	25	14	85	209	52	177	211
WINDHAM WPCF	183	155	192	229	194	166	175	104	82	85	134	305	178
ZONE: 2													
P BRISTOL WPCF	579	911	733	444	440	588	626	403	377	525	459	600	797
CANTON WPCF	35	140	132	128	128	129	112	94	85	87	87	111	117
P EAST HAMPTON WPCF	79	98	152	230	247	206	250	87	62	62	61	91	129
EAST HARTFORD WPCF	425	831	869	1227	938	1375	1586	1443	732	431	498	522	367
P EAST WINDSOR WPCF	87	36	50	36	29	29	34	22	18	23	29	35	43
ENFIELD WPCF	405	382	589	349	403	302	296	269	181	190	474	256	278
FARMINGTON WPCF	258	430	460	517	359	412	511	533	566	382	381	325	400
GLASTONBURY WPCF	142	335	337	330	287	309	320	258	218	235	262	313	279
HARTFORD WPCF	3456	7493	6638	7775	8570	7793	8884	6804	7481	6933	6951	7263	6313
MANCHESTER WPCF	454	904	1120	856	771	718	811	654	655	687	600	814	833
MATTABASSETT WPCF	1213	1553	1388	1073	1343	1570	1286	979	973	1057	1043	1111	1042
MIDDLETOWN WPCF	323	810	672	455	595	607	367	216	243	254	292	385	385

P = Project Facility

Report Date: 9/18/2007

Total Nitrogen Balance Sheet - Monthly Averages by Plant, 2006

	<u>Limit '06</u>	<u>JAN</u>	<u>FEB</u>	<u>MAR</u>	<u>APR</u>	<u>MAY</u>	<u>JUN</u>	<u>JUL</u>	<u>AUG</u>	<u>SEP</u>	<u>OCT</u>	<u>NOV</u>	<u>DEC</u>
PLAINVILLE WPCF	147	384	351	281	310	336	355	311	267	268	271	258	222
PLYMOUTH WPCF	61	75	113	83	54	71	97	64	43	67	55	138	97
P PORTLAND WPCF	46	71	48	31	51	37	47	21	18	18	22	21	28
ROCKY HILL WPCF	419	1099	846	511	662	1031	1048	756	625	717	646	865	637
SIMSBURY WPCF	156	351	357	340	276	336	279	204	69	43	58	72	82
SOUTH WINDSOR WPCF	153	428	282	285	288	281	268	267	228	277	324	303	341
SUFFIELD WPCF	65	202	94	89	21	83	82	134	126	85	39	51	44
VERNON WPCF	268	766	587	558	562	573	612	504	456	483	627	564	671
P WINDSOR LOCKS WPCF	96	114	101	148	114	101	101	96	84	59	66	87	102
WINDSOR POQUONOCK	142	496	434	438	403	479	462	381	426	439	434	394	392
WINSTED WPCF	93	200	195	205	192	229	222	233	238	239	276	224	228
ZONE: 3													
P BRANFORD WPCF	279	199	175	191	79	98	68	71	71	69	55	88	70
CHESHIRE WPCF	149	503	382	310	142	198	132	110	58	36	51	82	46
MERIDEN WPCF	653	1099	862	537	758	939	962	822	652	608	695	1068	917
P NEW HAVEN EAST WPCF	2279	3637	2175	1514	3163	2313	1338	1550	1265	1638	2272	2870	3519
P NORTH HAVEN WPCF	230	306	259	153	157	211	289	210	157	212	229	302	228
SOUTHINGTON WPCF	296	788	683	795	669	911	673	823	742	767	874	722	690
P WALLINGFORD WPCF	391	1069	738	556	546	670	589	362	310	345	293	413	372
P WEST HAVEN WPCF	513	980	693	468	634	728	466	423	407	413	398	555	392
ZONE: 4													
ANSONIA WPCF	167	376	317	304	290	361	330	189	207	196	197	338	363
BEACON FALLS WPCF	18	48	39	37	49	50	45	36	32	50	52	44	48
DANBURY WPCF	643	1960	1968	1928	2140	2257	2075	2662	2291	2125	1706	2055	1692
P DERBY WPCF	104	73	58	55	75	83	71	53	57	71	65	67	55
P LITCHFIELD WPCF	34	62	56	36	41	42	44	30	17	26	26	55	28
P MILFORD BEAVER BROOK	137	163	119	98	167	137	130	112	122	121	139	138	117
P MILFORD HOUSATONIC	448	789	576	592	655	613	463	372	487	513	523	631	669
NAUGATUCK TREATMENT	358	480	313	325	359	316	214	252	198	144	156	235	164
NEW MILFORD WPCF	35	80	55	84	109	93	71	90	93	89	88	90	91
P NEWTOWN WPCF	24	40	37	29	32	37	15	21	22	42	51	58	51
NORFOLK WPCF	16	37	27	39	22	29	36	21	25	22	27	39	20
NORTH CANAAN WPCF	19	24	29	26	19	23	17	17	15	26	21	33	22
SALISBURY WPCF	31	25	33	30	19	25	34	37	28	33	32	36	20

Total Nitrogen Balance Sheet - Monthly Averages by Plant, 2006

	<u>Limit '06</u>	<u>JAN</u>	<u>FEB</u>	<u>MAR</u>	<u>APR</u>	<u>MAY</u>	<u>JUN</u>	<u>JUL</u>	<u>AUG</u>	<u>SEP</u>	<u>OCT</u>	<u>NOV</u>	<u>DEC</u>
P SEYMOUR WPCF	89	83	74	76	80	94	62	46	30	47	79	65	57
SHELTON WPCF	154	577	428	506	512	464	420	420	397	503	453	561	513
SOUTHBURY TR. SCHOOL	22	16	11	8	14	17	10	6	4	4	4	12	9
P STRATFORD WPCF	517	1114	614	437	651	863	409	317	409	358	408	478	389
P THOMASTON WPCF	61	56	51	47	64	42	41	37	21	33	38	60	42
TORRINGTON WPCF	361	418	349	262	318	277	259	224	189	190	198	285	208
P WATERBURY WPCF	1468	1569	1478	728	1475	1339	1624	1173	471	388	512	670	583

ZONE: 5

P BRIDGEPORT EAST WPCF	526	491	533	643	673	645	700	486	413	240	201	344	242
P BRIDGEPORT WEST WPCF	1514	1479	1212	1105	1834	1158	872	1067	1032	1056	872	1130	917
P FAIRFIELD WPCF	591	707	618	452	664	728	537	449	412	563	378	547	299
P WESTPORT WPCF	126	197	131	201	212	148	126	212	121	174	93	124	95

ZONE: 6

P GREENWICH WPCF	697	1122	552	489	476	524	605	349	396	408	389	500	434
P NEW CANAAN WPCF	93	37	20	17	36	26	28	20	27	28	31	52	32
P NORWALK WPCF	1044	965	868	726	852	741	657	663	708	799	627	726	727
P RIDGEFIELD SOUTH ST.	42	71	35	22	22	26	29	18	14	17	24	37	21
P STAMFORD WPCF	1346	1990	1470	1404	1426	1256	838	489	579	585	615	920	776

End-Of-Pipe Total

44,877 37,767 35,242 40,003 39,818 37,061 31,431 28,911 28,798 29,554 34,429 31,659

Equalized Total

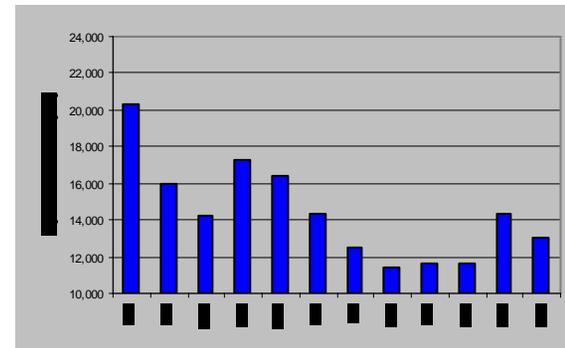
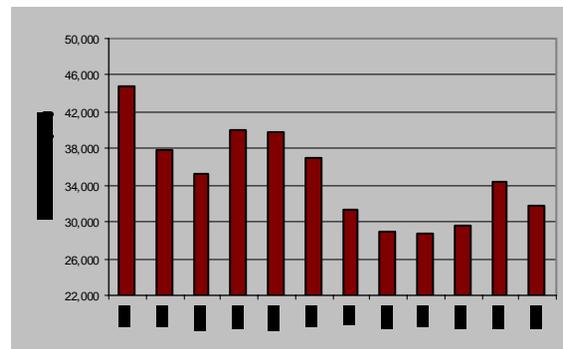
20,262 15,992 14,253 17,223 16,456 14,367 12,503 11,432 11,678 11,645 14,326 13,011

End-Of-Pipe Permit = 26,801

End-Of-Pipe Avg. = 34,962

Equalized Permit = 13,280

Equalized Avg. = 14,429



**LIS Total Nitrogen Credit Exchange
Final Balance - 2006**

SELLING Credits

<u>Facility Name</u>	
★ STAMFORD WPCF	-\$393,397
★ BRIDGEPORT WEST WPCF	-\$389,240
★ NORWALK WPCF	-\$358,649
★ WATERBURY WPCF	-\$347,728
★ GREENWICH WPCF	-\$219,657
★ BRANFORD WPCF	-\$131,050
★ NEW CANAAN WPCF	-\$78,183
★ TORRINGTON WPCF	-\$71,482
★ NAUGATUCK TREATMENT Co.	-\$70,737
★ FAIRFIELD WPCF	-\$64,346
★ BRIDGEPORT EAST WPCF	-\$61,181
★ DERBY WPCF	-\$32,427
★ NEW LONDON WPCF	-\$30,826
★ SEYMOUR WPCF	-\$19,124
★ ENFIELD WPCF	-\$17,448
★ RIDGEFIELD SOUTH ST. WPCF	-\$17,374
★ MONTVILLE WPCF	-\$16,307
★ EAST WINDSOR WPCF	-\$12,968
★ THOMASTON WPCF	-\$12,658
★ SOUTHBURY TR. SCHOOL WPCF	-\$6,850
★ KILLINGLY WPCF	-\$6,776
★ NEW HAVEN EAST WPCF	-\$5,957
★ MILFORD BEAVER BROOK WPCF	-\$5,820
★ GROTON CITY WPCF	-\$5,808
★ NORTH HAVEN WPCF	-\$2,978
★ PORTLAND WPCF	-\$2,978
★ WINDHAM WPCF	-\$2,978
★ MATTABASSETT WPCF	-\$2,730
★ JEWETT CITY WPCF	-\$2,532
★ STONINGTON PAWCATUCK WPCF	-\$2,110
★ BRISTOL WPCF	-\$894
★ LEDYARD WPCF	-\$894
★ SALISBURY WPCF	-\$869
TOTAL	-\$2,394,956

BUYING Credits

<u>Facility Name</u>	
HARTFORD WPCF	\$982,624
DANBURY WPCF	\$815,759
SOUTHINGTON WPCF	\$282,762
SHELTON WPCF	\$271,059
NORWICH WPCF	\$119,732
EAST HARTFORD WPCF	\$112,472
MERIDEN WPCF	\$105,808
★ MILFORD HOUSATONIC WPCF	\$104,765
★ ANSONIA WPCF	\$101,439
★ WALLINGFORD WPCF	\$97,543
★ ROCKY HILL WPCF	\$91,338
★ MANCHESTER WPCF	\$78,046
★ VERNON WPCF	\$73,566
★ WINDSOR POQUONOCK WPCF	\$68,379
★ GROTON TOWN WPCF	\$55,175
★ FARMINGTON WPCF	\$40,655
★ GLASTONBURY WPCF	\$36,734
★ PLAINVILLE WPCF	\$34,401
★ SOUTH WINDSOR WPCF	\$34,190
★ NEW MILFORD WPCF	\$29,114
★ MIDDLETOWN WPCF	\$29,039
★ WINSTED WPCF	\$29,039
★ WESTPORT WPCF	\$28,481
★ WEST HAVEN WPCF	\$24,572
★ PUTNAM WPCF	\$22,239
★ BEACON FALLS WPCF	\$21,618
★ CANTON WPCF	\$17,424
★ STRATFORD WPCF	\$16,629
★ EAST HAMPTON WPCF	\$15,140
★ CHESHIRE WPCF	\$13,378
★ PLAINFIELD NORTH WPCF	\$11,988
★ SIMSBURY WPCF	\$11,169
★ NEWTOWN WPCF	\$6,850
★ NORFOLK WPCF	\$5,647
★ UCONN WPCF	\$5,585
★ SUFFIELD WPCF	\$5,423
★ STAFFORD SPRINGS WPCF	\$4,840
★ PLYMOUTH WPCF	\$4,244
★ STONINGTON BOROUGH WPCF	\$3,797
★ PLAINFIELD VILLAGE WPCF	\$3,301
★ THOMPSON WPCF	\$2,904
★ STONINGTON MYSTIC WPCF	\$2,681
★ SPRAGUE WPCF	\$2,184
★ LITCHFIELD WPCF	\$2,172
★ NORTH CANAAN WPCF	\$1,737
★ WINDSOR LOCKS WPCF	\$472
TOTAL	\$3,828,114

Difference: Selling - Buying = \$1,433,158

★ = Clean Water Fund Nitrogen Project Facility

The final balance (annual dollar amount) for each facility was calculated by subtracting the facility's 2006 TN loading as reported to DEP, from the facility's General Permit 2006 limit; The difference was then multiplied by the E-factor for that facility to determine the number of credits available to sell or needed to purchase. Credits were then multiplied by the value of a credit (\$3.40) to calculate the annual balance shown above.

Balance for Torrington WPCF was corrected on March 19, 2007.
 Balance for Rocky Hill WPCF and Vernon WPCF were corrected on April 17, 2007
 Balance for Danbury WPCF was corrected on April 20, 2007
 Detailed invoices will be mailed by March 31, 2007

**Attachment D
Total Annual
Project Cost – 2006**

Project Facilities	Total Annual Capital Cost	Total Annual O&M Cost	Total Annual Project Cost
BRANFORD WPCF	\$168,661	\$303,227	\$471,888
BRIDGEPORT EAST WPCF	\$51,755	\$459,666	\$511,421
BRIDGEPORT WEST WPCF	\$155,266	\$976,788	\$1,132,054
BRISTOL WPCF	\$28,759	\$111,120	\$139,879
DERBY WPCF	\$31,785	\$68,542	\$100,327
EAST HAMPTON WPCF	\$30,144	\$52,566	\$82,710
EAST WINDSOR WPCF	\$61,136	\$32,560	\$93,696
FAIRFIELD WPCF	\$514,885	\$362,590	\$877,475
GREENWICH WPCF	\$0	\$122,615	\$122,615
JEWETT CITY WPCF	\$65,659	\$98,362	\$164,021
LEDYARD WPCF	\$18,062	\$19,650	\$37,712
LITCHFIELD WPCF	\$45,829	\$44,935	\$90,764
MILFORD BEAVER BROOK WPCF	\$9,074	\$33,500	\$42,574
MILFORD HOUSATONIC WPCF	\$0	\$147,919	\$147,919
NEW CANAAN WPCF	\$56,656	\$43,867	\$100,523
NEW HAVEN EAST WPCF	\$151,122	\$601,107	\$752,229
NEW LONDON WPCF	\$54,978	\$434,778	\$489,756
NEWTOWN WPCF	\$72,954	\$77,852	\$150,806
NORTH HAVEN WPCF	\$54,418	\$153,149	\$207,567
NORWALK WPCF	\$276,853	\$641,193	\$918,046
PORTLAND WPCF	\$44,740	\$67,069	\$111,809
RIDGEFIELD SOUTH ST. WPCF	\$0	\$34,179	\$34,179
SEYMOUR WPCF	\$14,654	\$100,190	\$114,844
STAMFORD WPCF	\$2,238,236	\$866,986	\$3,105,222
STRATFORD WPCF	\$0	\$305,326	\$305,326
THOMASTON WPCF	\$56,408	\$66,198	\$122,606
UCONN WPCF	\$0	\$33,500	\$33,500
WALLINGFORD WPCF	\$122,125	\$211,968	\$334,093
WATERBURY WPCF	\$737,935	\$423,544	\$1,161,479
WEST HAVEN WPCF	\$0	\$337,449	\$337,449
WESTPORT WPCF	\$0	\$40,000	\$40,000
WINDSOR LOCKS WPCF	\$84,200	\$147,794	\$231,994
TOTAL	\$5,146,294	\$7,420,189	\$12,566,483

Attachment E

Nitrogen Removal Projects Financed by the CWF through 2007

City or Town	Total Project Cost	Nitrogen Cost Portion	Year project placed in service
Seymour	9,800,000	250,000	1993
East Windsor	10,000,000	1,000,000	1996
Fairfield Phase 1	4,700,000	4,700,000	1996
Greenwich	500,000	500,000	1996
Milford BB Phase 1	1,000,000	1,000,000	1996
Milford H Phase 1	650,000	650,000	1996
Norwalk Phase 1	1,100,000	1,100,000	1996
Ridgefield	200,000	200,000	1996
Stratford Phase 1	800,000	800,000	1996
Univ. of Conn	12,000,000	1,058,000	1996
West Haven Phase 1	750,000	750,000	1996
Westport Phase 1	400,000	400,000	1996
Ledyard	3,500,000	3,500,000	1997
New Haven Phase 1	8,200,000	8,200,000	1997
Newtown	12,000,000	1,058,000	1997
Stamford Phase 1	3,500,000	3,500,000	1997
Derby	2,763,000	2,763,000	2000
New Canaan	14,000,000	1,235,000	2000
Norwalk Phase 2	56,000,000	5,538,000	2000
Waterbury	120,000,000	17,359,000	2000
East Hampton	690,000	690,000	2001
Thomaston	9,313,000	1,164,000	2001
New London	3,069,000	2,889,000	2002
Portland	5,200,000	1,047,000	2002
Branford	21,542,000	3,158,000	2003
Fairfield Phase 2	40,551,000	12,046,000	2003
Windsor Locks	2,349,000	1,841,000	2003
Bridgeport E Phase 1	2,090,000	2,090,000	2004
Bridgeport W Phase 1	2,375,000	2,375,000	2004
Bristol Phase 1	584,000	584,000	2004
Enfield	2,390,000	2,390,000	2004
Litchfield	4,000,000	1,000,000	2004
Jewett City	10,000,000	1,500,000	2005
Stamford Phase 2	97,223,000	59,500,000	2006
North Haven	1,000,000	1,000,000	2006
Wallingford	2,276,000	2,276,000	2006
East Hartford	1,965,000	1,965,000	2007
Cheshire	5,775,000	5,775,000	2007
Simsbury	21,231,000	4,044,000	2007
Westport Phase 2	37,131,000	8,253,000	2007
Shelton	21,642,000	4,293,000	2007
Suffield	4,075,000	3,370,000	2007
Winsted	1,100,000	1,100,000	2007
Hartford Interim Project	6,900,000	6,900,000	2008
Stratford Phase 2	54,000,000	10,116,000	2009
Milford BB Phase 2	11,700,000	1,613,000	2009
Milford H Phase 2	34,900,000	10,038,000	2009

City or Town	Total Project Cost	Nitrogen Cost Portion	Year project placed in service
Plainville	25,541,000	6,217,000	2009
Glastonbury	30,611,000	6,671,854	2009
Meriden	42,455,000	32,517,000	2010
Danbury	5,000,000	5,000,000	2010
Southington Interim Project	13,000,000	13,000,000	2010

Nitrogen Credit Advisory Board 2008 Meeting Schedule

All meetings are schedule for 10:00 am in the Holcombe Room on the 5th floor at 79 Elm Street, Hartford

January 16, 2008

February 20, 2008

March 19, 2008

April 23, 2008

May 21, 2008

June 18, 2008

July 16, 2008

August 20, 2008

September 17, 2008

October 15, 2008

November 19, 2008

December 17, 2008