



**New York State  
Department of Environmental Conservation**

***Division of Water***

Response To Public Comments On  
Total Maximum Daily Load Analysis to Achieve Water  
Quality Standards for Dissolved Oxygen in Long Island  
Sound

January 2001



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***Governor***

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# **Response to Public Comments**

## **Total Maximum Daily Load Analysis to Achieve Water Quality Standards for Dissolved Oxygen in Long Island Sound**

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### **INTRODUCTION**

This document is the New York State Department of Environmental Conservation (NYSDEC), Division of Water's (DOW) response to public comments on the Total Maximum Daily Load Document (TMDL) analysis to Achieve Water Quality Standards (WQS) for Dissolved Oxygen (DO) in Long Island Sound (LIS). A list of acronyms used in this document are listed in appendix A.

Fifteen (15) comment letters were received. Thirteen of the fifteen comment letters were concerned with different aspects of the TMDL, whereas two requested the extension of the comment period. In view of this, the comment period was extended from January 9, 2000 to February 9, 2000. The NYSDEC evaluated these comments which provided input to the finalization of the TMDL.

### **PUBLIC PARTICIPATION**

Notice of availability of the Draft TMDL was made available to approximately 65 local government representatives and interested parties on November 16, 1999. The TMDL was public noticed in the State Environmental Notice Bulletin (ENB) on November 24, 1999 as Region 1 and 2 notices and on December 1, 1999 as a statewide notice. A 45-day public review period was established for soliciting written comments from stakeholders prior to the finalization and submission of the TMDL for United States Environmental Protection Agency (USEPA) approval.

The TMDL was also made available through the NYSDEC and LIS Study Website at: 1

<http://www.dec.state.ny.us/dow/index.html>, and

<http://www.epa.gov/region01/eco/lis/index.html>, respectively.

NYSDEC held three (3) public meetings at the following places to discuss and answer questions on the proposed TMDL.

1. December 2, 1999 in East Setauket, NY at the NYSDEC Office; 205 North Belle Meade Road; Suite 1; Meeting Room, 1:00 PM.
2. December 6, 1999 in Manhasset, NY at the Town of North Hempstead Town Hall; Town Board meeting Room; 2<sup>nd</sup> floor; 220 Plandome Road; 1:00 PM.
3. December 15, 1999 in White Plains, NY at the Westchester County Center; Conference room D; 198 Central Avenue; 1:00 PM.

Staff from NYSDEC, Connecticut Department of Environmental Protection (CTDEP) and USEPA were present at

these meetings. The NYSDEC personal discussed the issues relating to hypoxia (DO < 3.0 mg/l), nitrogen as the pollutant which contributes to the causes of low DO levels in LIS, listing of the Sound on the 303(d) list, and the development of a TMDL as a vehicle to restore the environmental health of the Sound.

In response to a number of requests, NYSDEC extended the comment period twice, the final comment period ended on February 9, 2000.

Thirteen commenters, as identified below, provided comments concerning various aspects of TMDL which were considered in finalizing the TMDL .

Name	Associated Organization
1. Malcolm J. Bowman, Professor 2. Robert C. Aller, Distinguished Professor 3. Dr. Douglas Hill, P.E., P.C. 4. Robert Wilson, Prof. of physical Oceanography	State University of New York Marine Sciences Research Center
5. Ben Wright, P.E.	County of Suffolk Dept. of Public Works
6. R. L. Swanson	Waste Reduction & Management Institute Marine Sciences research Center
7. Ms. Rosemary Knoatich	NYS Legis. Comm. On WR Needs of NYS and LI,
8. John Atkin	Save the Sound, Inc.
9. Terry Becker	Soundkeeper
10. Libby Ford 11. Richard M. Cogen, Esq.,	Sound Nitrogen Management Coalition
12. John V. D'Aquino, P.E.	Westchester County Dept. of Environmental Facilities
13. Joel A. Miele, Sr., P.E.	The City of New York, Dept. of Environmental Facilities

In addition, the USEPA provided comments in their April 6, 2000 letter to the NYSDEC which were required to be addressed in the final TMDL in order to receive the approval from the USEPA. These comments have not been addressed in this responsiveness summary, since the comments were all addressed in the final TMDL. A copy of these comments are included as appendix B for your information.

## Comments

**Comment 1:** The public comment period was requested to be extended.

**Response 1:** The comment period was first extended from January 9, 2000 to January 28, 2000 and later to February 9, 2000.

**Comment 2:** Suggested holding a public meeting in New York City (NYC) for public interest on the TMDL.

**Response 2:** No additional public meetings are contemplated for this TMDL. However, NYSDEC will strongly consider holding a public meeting in NYC in the future on matters related to the LIS TMDL.

**Comment 3:** It's appropriate that implementation is scheduled in phases and allows for adaptive management in order to consider new information and response or change in environmental conditions as the TMDLs takes place.

**Response 3:** NYSDEC agrees.

**Comment 4:** TMDLs for other pollutants such as Hg and PCBs should be considered since they have proven to have adverse effects on fish

**Response 4:** This is outside the scope of the proposed TMDL. The LIS Study has included toxics as substance of concerns in the Comprehensive Conservation Management Plan (CCMP), March 1994, as a priority item. Currently, the noted pollutants are not listed on the 303(d) list for LIS.

## **Dissolved Oxygen Standard**

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**Comment 5:** USEPA is deriving regional criteria for nitrogen and both states should revisit the DO standard being developed for salt water by USEPA.

**Response 5:** NYSDEC is committed to evaluate the USEPA salt-water DO standard for estuarine marine waters.

**Comment 6:** DO standards for LIS need to be revised, and these revisions need to be supported by a Use Attainability Analysis (See 40 CFR 131.10(g)).

**Response 6:** This TMDL has been developed to comply with the current DO standards in both states. Any future change in the standard will require review of this TMDL.

**Comment 7:** The statement that the TMDL will be revised upon adoption of revised DO standards (p.38) should not be used to justify a phased TMDL. DO standard revision is uncertain.

**Response 7:** The Phased approach used in the LIS TMDL is consistent with guidance contained in Guidance for Water Quality-based Decisions: the TDML Process (April 1991)(Pages 20 thru 22). The TDML has been developed to attain the applicable NYS DO standard of 5.0 mg/l. Due to the evolving state of our knowledge a periodic review (every five years) is a critical part of the TMDL. Revisions will be made to the TMDL only if the review requires such revisions.

**Comment 8:** The TMDL should specify that the objective of the TMDL is the eventual attainment of the DO WQS within the open waters of the Sound.

**Response 8:** The proposed TMDL, section I.C, specifies the attainment of DO WQS within the open waters of the Sound as an objective.

**Comment 9:** The TMDL should specifically state that if other means (carbon -BOD reductions, mixing/aeration, etc.) can be forecasted to achieve or contribute to the same magnitude of DO improvements projected by the LIS 3.0 (or subsequent) model, they can be implemented in lieu of nitrogen reduction.

**Response 9:** The purpose of this TMDL is to address the low DO problems in the LIS. The LIS Study has identified nitrogen as the pollutant most directly linked to the causes of hypoxia in the Sound. Nitrogen promotes the growth of phytoplankton which in turn reduces the level of DO in the LIS. The States acknowledge that carbon reductions will result from the reduction of nitrogen loads to the Sound and that those reductions are likely to have a positive effect on the DO in the LIS. The examination and associated calculations of benefits of carbon reduction indicate that carbon reduction will not achieve the same magnitude of DO improvement as nitrogen reduction, and therefore, can not replace nitrogen control. Only total nitrogen (TN) reduction, in conjunction with the other non-treatment alternatives, can achieve the desired DO levels in the LIS which are required by this TMDL.

The purpose of limiting nitrogen is to control primary production of phytoplankton and the oxygen demand associated with the ultimate decay of that organic mass. The hypoxic areas of the Sound are primarily impacted by oxygen demands created by the primary production and less by the discharged carbon oxygen demand. If improvements occur from reduced carbon discharges it will mean that a smaller deficit will have to be addressed by Phases IV and V of the TMDL.

**Comment 10:** The designated uses are not documented, cited or described in the TMDL. Improvements in survival rates are not referenced to a baseline or biological target population for each species mentioned.

**Response 10:** The current TMDL is concerned with meeting the DO standards in LIS to protect the current best use designations. Improvements in the biological survival rates were considered while evaluating the 58.5% reduction level proposed, but need not be part of the TMDL.

The designated uses of the LIS are listed in the TMDL under Section III. The report, Phase III Actions for Hypoxia Management (July 1998, EPA 902-R-98-002) contains a section on the benefits of the nitrogen reduction targets (page 17). The benefits to adult abundance, and larval survival are described for three areas in the Sound. The baseline for comparison was the “no-action alternative.” Complete attainment of WQS would eliminate impacts on survival and growth for both adult and juveniles.

## **POINT SOURCE**

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**Comment 11:** The TMDL needs to either make a serious assessment of the issue of carbon loads or be described as a TMDL for nitrogen only, rather than for DO.

**Response 11:** LIS Study has identified nitrogen as a primary pollutant causing hypoxia (DO<3.0 mg/l) in the Sound. Therefore, the proposed TMDL has been developed to reduce nitrogen loadings to the Sound by 58.5%. As a consequence of nitrogen reductions, a reduction of 10 percent in carbon

(TOC) loading is anticipated. The impact of carbon reduction has been accounted for in the Phase III TMDL.

**Comment 12:** TMDL analyses are largely limited to a restricted period in the late 90's and extrapolation of point source data is the rule.

**Response 12:** The TMDL analysis has been conducted using the LIS 3.0 model (approved by an independent Model Evaluation Group(MEG)), calibrated for the 1988-1989 period and the loading data indicated in the Baseline Loading Report<sup>1</sup> prepared by NYSDEC and CTDEP. The extrapolation of loading was done for three facilities - Northport (V), North Castle and Greenport (V) due to a lack of data. These facilities were included in the October 1999 LIS Study Draft DO TMDL.

**Comment 13:** The TMDL needs to present a clear summary of the overall nitrogen and carbon loads affecting LIS. Include a map showing the geographical extent of Connecticut and New York waters.

**Response 13:** The summary of nitrogen and carbon loadings is indicated in the proposed TMDL document. Please see Tables 1 and 2. These tables include only in-basin loads, however, out of basin loads are discussed in the text of the TMDL. The map showing the geographical extent of Connecticut and New York waters has been included in the TMDL.

**Comment 14:** The baseline load for Zone 9 is based upon primary treatment (especially, Newtown Creek STP), not secondary. The Waste Load Allocation (WLA) for Newtown Creek STP should be subtracted from the TMDL until it meets the effluent limitations required under the Clean Water Act (CWA).

**Response 14:** Newtown Creek STP is and was discharging at less than secondary treatment at the time the baseline was established. The level of treatment was not an issue when the baseline was established. The reason it was not an issue is that secondary treatment does little to remove nitrogen from the wastewater discharge. Nitrogen removal requires advanced wastewater treatment.

**Comment 15:** The Draft TMDL underestimates the 1990 point source nitrogen baseline for management Zone 10.

**Response 15:** The loading data contained in the TMDL is based upon approximately three years of Discharge Monitoring Report (DMR) data for all the facilities in management Zone 10, with the exception of the Belgrave facility. For this facility, only nine months of DMR data was used for developing the baseline load. The TN loading is appropriate and does not need any adjustment or revision.

**Comment 16:** The TMDL is misleading with respect to the impact of nitrogen from point sources and should be corrected to give a more accurate account of overall nitrogen loading.

**Response 16:** The nitrogen loads indicated in Table 1 of the TMDL are based on the best available data and reflects refinement of the loads contained in the CCMP issued in 1994 (Figure 6). The CCMP contains boundary loads whereas Table 1 does not. The categorization of the load in table 1 is

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<sup>1</sup> Final LIS Study Baseline Loading Report, CTDEP & NYSDEC, January 31, 1992.

different. The nitrogen loads have been categorized into boundary, tributary, atmospheric and coastal; and pre-colonial, terrestrial and atmospheric in the CCMP and TMDL, respectively. Please note that boundary loads are included in the TMDL as “out-of-basin” loads. Also, both states added new facilities for the TMDL process. Therefore, the Department does not believe that the TMDL is misleading.

**Comment 17:** Centrate from North River was delivered to Wards Island in Zone 8. It is an out-of-basin source and should not be considered in the TMDL calculations. NY has not provided adequate data to show centrate sources, which should be discussed, in the out-of-basin section of the TMDL.

**Response 17:** NYSDEC does not consider the centrate from the North River sludge as an out of basin source of nitrogen. NYCDEP’s ability to de-water sludge at all of their facilities is limited by space and other conditions. The North River sludge is de-watered at the Wards Island facility and is, therefore, considered an in-basin source. When the Ocean Dumping Ban Act requirement to cease the ocean disposal of sludge by 1992 created the need for the de-watering of city sludge, the LIS Management Conference recognized the City’s limited ability to treat the sludge at all their facilities. The Conference recognized the City’s need to de-water the sludge at the East River facilities by increasing the nitrogen baseline in Zone 8 to include the centrate of the de-watered sludge. The point source baseline load (Table 6, column 2) for Zones 8 and 9 reflect NYCDEP’s implementation of the Sludge Management Plan to comply with the Ocean Dumping Ban Act which was approved by NYSDEC and USEPA.

**Comment 18:** Westchester County expects that percent reduction as expected in the TMDL will use 5200 lbs/day as the base line load for establishing new SPDES permit limits or conditions.

**Response 18:** The TMDL point source baseline load for Westchester County (Zone 7) is 837 tons/year - 4585 lbs/day. The baseline loads for four (4) of the five (5) facilities (New Rochelle, Mamaroneck, Blind Brook and Port Chester) are consistent with the Baseline Loading Report<sup>2</sup>, which was jointly prepared by NYSDEC and CTDEP. The loading for the North Castle is 33 lbs/day. As noted in Response 12, this facility was included in the TMDL process in September 1999.

**Comment 19:** What is the impact of North Castle values (load) which are newly added to the management zone? This was not originally included in the base load allocations (LA).

**Response 19:** NYSDEC does not know the impact of North Castle discharge on the water quality of the Sound. North Castle and other individual small dischargers - such as Northport (V) and Greenport (V) were not included in Phase III. NYSDEC has included all these dischargers in the TMDL process for uniformity sake. The individual impact on water quality from these discharges have not been evaluated with respect to the hypoxic conditions in the LIS..

**Comment 20** Changes in the baseline loading assumptions have resulted in a TMDL baseline loading which differs

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<sup>2</sup>Final LIS Study Baseline Loading Report, CTDEP & NYSDEC, January 31, 1992

so dramatically from that used as an input to the LIS 3.0 model and to set the Phase III targets, that neither the Phase III targets reduction work nor the LIS 3.0 model provide valid support for the TMDL.

**Response 20:** The difference between the Phase III loads and the TMDL baseline load is small. The difference does not warrant the re-running of the LIS 3.0 model. The LIS 3.0 unit response matrix was used to evaluate DO impacts of these changes and these impacts were not significant. They were small and provided the necessary support to proceed with the TMDL.

## **Nonpoint Source**

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**Comment 21:** The LIS study goal is to reduce non-point source load by 10 percent. Save the Sound would like to see the base line nonpoint source (NPS) pollution data and the technology to achieve this objective.

**Response 21:** The NPS loading is provided for in Appendix B, of the TMDL. We believe that 10 percent reduction of the NPS (urban and agriculture) load is achievable through an aggressive nonpoint control source programs (Best Management Practices (BMP)).

**Comment 22:** NYSDEC should be sure that there is a way to accurately evaluate the reduction of NPS loads which tends to be an elusive source of pollution.

**Response 22:** The inaccuracies of nonpoint load quantification does not mean that the nonpoint loads cannot be controlled. The inaccuracies may make verification and enforcement difficult, but not impossible. The impact of applied BMPs and other control measures can be monitored and estimated. The estimated load reductions can be tallied and compared to the reduction goals. New NPS must be discouraged or offset so that an estimate of the net reductions can be compared with the goal. The goal of the TMDL is a reduction in loads, not a redistribution of those loads.

**Comment 23:** Polluted runoff should be reduced more than 10% since it contributed to 100% closure of shellfishing beds in New York State.

**Response 23:** TN has not been linked to the closure of the shellfish beds in the Sound. The polluted runoff laden with pathogens is responsible for the closure of shellfish beds in the Sound and embayments. This TMDL has been developed to correct the hypoxic conditions in the Sound by reducing nitrogen loads from point and nonpoint sources. As stated in the TMDL, a ten percent (10%) reduction in TN is anticipated through the application of aggressive BMPs to the nonpoint sources-polluted runoff in the Sound watershed. The BMPs would also help in reducing the pathogens loading to the receiving waters. In order to achieve both objectives, NYSDEC has encouraged all the towns, villages and counties to develop site specific non point control programs per the Priority Water Body List/ 303(d)list. NYSDEC has received and funded several nonpoint control project proposals through the Clean Water/Clean Air Bond Act. These projects would lessen NPS impacts upon water quality. Closed shellfishing beds in the Sound basin are included in the 303(d) list for pathogens. At this point in time, TMDLs are still required to be completed for these waters based on the pathogen listing.

- Comment 24:** The TMDL should factor nitrogen reductions anticipated through the specific projects that have been identified to reduce NPS for Management Zone 10.
- Response 24:** The Management Zone Implementation Plans, when developed, will consider the nitrogen reduction from specific projects.
- Comment 25:** The treatment of NPS in the Draft TMDL is inconsistent with applicable regulations and guidance as municipal storm water point sources and combined sewer overflows are lumped together.
- Response 25:** A portion of the NPS load is actually conveyed through storm water outfalls and combined sewer overflows (CSOs) to LIS. Since CSO and storm water outfalls discharge to receiving waters via discrete conveyances (i.e., pipe outlets), they are by definition point sources for regulatory purposes under the CWA. However, given the geographic scale of the LIS TMDL and the land use-based approach used to estimate loadings, it was not feasible to meaningfully separate loadings from point source storm water runoff and CSOs from the general wet weather runoff category, with the exception of the NYC CSO loads (zones 8 and 9).  
In Connecticut, pollutant loading estimates for CSOs were not available due to a scarcity of monitoring data for both pollutant concentrations and discharge volumes. Instead, the sewage treatment plant (STP) loads, based on discharge monitoring, include the nitrogen that would overflow during wet weather conditions. Similarly, the export coefficients used to estimate land runoff of nitrogen account for storm water contributions on CSO areas. In this approach, Connecticut CSO loads were effectively distributed between the point source and nonpoint source categories. None of the CSO nitrogen load was missed; it was just assigned to the point and nonpoint source categories relevant to each CSO drainage area. In the future, as New Haven, Hartford, Norwalk, Bridgeport, and Norwich develop long-term control plans for their CSO systems, monitoring data will be collected to more clearly document discharge volumes and pollutant concentrations.
- However, with USEPA's recent (December 8, 1999) promulgation of phase II storm water regulations, many previously unregulated storm water discharges will require NPDES permit coverage and will require the application of BMP and other measures. Since, at present, there is insufficient information to determine the universe of point source vs. nonpoint source storm water discharges, it is reasonable for now to collectively characterize these sources. Development of the phase II storm water permitting program over the next few years will provide opportunities for the states to elucidate the load from storm water sources and, building on the phase II regulations, identify appropriate WLA.
- Comment 26:** Development on the North Shore may be halted, or new development may be forced to discharge its nitrogen containing wastewater through septic tanks and leach-fields which, ironically, will result in higher levels of nitrogen being discharged to the Sound via the ground water underflow.
- Response 26:** Development will have to be well planned as not to increase the loads of nitrogen to the Sound. The Management Zone Implementation Plans, when developed, will need to take into consideration the effects development will have on nitrogen reduction and provide a planned approach for future development on the North Shore of Long Island.

- Comment 27:** The TMDL should include a written discussion of how the NPS reductions will be funded (i.e. local funding, State or federal funding, use taxes, etc.)
- Response 27:** The State of New York is providing funds to locales to help implement the TMDL through the Clean Air/Water Bond Act and other programs. The costs of local implementation will have to be addressed in the Management Zone Implementation Plans that will be developed to meet the TMDL requirements.
- Comment 28:** The TN loading from groundwater has been underestimated.
- Response 28:** The NPS estimates used in the LIS study considered groundwater flow but did not distinguish the groundwater flow from the surface water flow. An underestimation of the groundwater flow therefore does not necessarily negate the estimates and the source of the loads was not critical to the water quality analysis. If new data or knowledge justifies it, a re-examination of the NPS loads will be made as a part of the five-year review of the TMDL. NYSDEC and the United States Geological Survey are currently re-evaluating the groundwater after contribution of nitrogen.

### **LIS 3.0**

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- Comment 29:** Error propagation and realistic uncertainties in various analyses and conclusions are lacking or ignored throughout the report.
- Response 29:** Uncertainties are inherent in an analysis of this scope. The TMDL identifies areas of uncertainty and proposes an adaptive management program to reduce those uncertainties through additional research, monitoring, and assessment. The TMDL outlines an evaluation process to incorporate new findings and revise management approaches.
- The national guidance on preparation of TMDLs highlights that uncertainties will exist in TMDL analyses, such as identifying NPS loss and control options, and recommends that a phased TMDL that identifies actions to reduce those uncertainties be prepared in those situations. The LIS TMDL follows this approach.
- Comment 30:** There has been virtually no concerted long-term funding of process-oriented research in LIS beyond collection of very basic water quality data.
- Response 30:** This is not a TMDL issue, however, currently LIS study office is funding the process-oriented research studies in addition to the collection of water quality data. The LIS study has supported annual monitoring of the Sound since 1986. The Department agrees that process-oriented research is a necessary complement to the basic monitoring program. Support for research is a current priority of the LIS Study and this is reflected in a request for proposals that was announced in November 1999. Three projects were funded in August 2000 from that announcement. In addition, Congress this year has approved \$6.6 million in federal funds to support research on the die-off of lobsters in LIS. A portion of these funds are available to support process-oriented research on conditions affecting lobsters.

**Comment 31:** Long-term records of fundamental ecosystem data such as primary production, secondary production, respiration, species composition, water circulation and elemental cycling rates are generally lacking. Plankton composition and production patterns need to be studied too, as they may vary year to year.

**Response 31:** This is not a TMDL issue, however, NYSDEC intends to address these issues in the future through site-specific studies. The available information from such studies will be considered in the subsequent TMDL review, the first review is due in August 2003. See response 30.

**Comment 32:** The transport in this part of the Sound (Smithtown Bay) is poorly defined and we believe it is in an easterly direction. We therefore feel more inclined of our need to perform a survey for SD #6 to assess the reduced impact on the LIS study centroid.

**Response 32:** The currents in the Sound are complicated. The Sound's circulation involves several gyres and numerous eddies. Therefore, the direction of the near shore currents are not necessarily indicative of the final transport within the system. The LIS 3.0 model indicated that the transport in the Smithtown Bay area is eastward; but also in the northward and westward directions. The long term transport in this area is well defined and part of the flow does flow towards a "hot spot". Therefore, there is no need to conduct a near shore small scale survey to assess the reduced impact on the "hot spot".

In addition, the impacts of the various management zone loads were analyzed by simulating the conditions that would occur if the loads were removed from the Sound. The impact was determined by comparing the zero load simulation with the base simulation that included the loads. The predicted improvement in the DO concentration was the impact of the removed loads.

## **Modeling Tools**

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**Comment 33:** The LIS 3.0 model is geographically limited to the sound and cannot be used to predict effects of action that may be implemented in neighboring estuaries such as NY/NJ Harbor. A system wide model is needed.

**Response 33:** A system wide model is needed to make such an assessment and both the draft and final TMDL explicitly outline steps to use the SWEM as a tool to assess system wide responses to management actions.

**Comment 34:** The TMDL development relies on analyses made using an outdated analytical tool. This TMDL has significant implications with respect to costs and regional growth and its development should be based on the best available information.

**Response 34:** Several comments criticized the use of the LIS 3.0 model in the analysis, especially in light of the development of the SWEM. NYSDEC defends the use of the LIS 3.0 model while admitting there are problems with the location of the ocean boundaries. However, the Model was developed and applied with full knowledge of the boundary proximity problem. The Model reproduced the temporal and spatial trends in observed data (in terms of pollutant transport and transformation) and successfully simulated 1988-1989 conditions. The Model was also approved by the LIS study

MEG for use as a predictive tool.

Subsequent to the analyses upon which the TMDL is based, the NYC sponsored the development of the SWEM. The SWEM was developed to eliminate the boundary problems inherent in the LIS 3.0 model. Based on the additional data collected for its development, other improvements were also incorporated into the SWEM. The NYSDEC acknowledges the improvements and advantages the SWEM has to offer over the LIS 3.0 model and believes it should be used in future analyses. However, the SWEM has just recently been accepted by a regional MEG and has not been applied as extensively as the LIS 3.0 model.

The NYSDEC supports the use of the SWEM to redevelop a unit response matrix for LIS and update the more critical scenarios that were used in developing the Phase III actions. Those simulations would then be available for use in the 2003 review of the Phase III actions and the TMDL.

- Comment 35:**
- a. SWEM simulations of the LIS Study planning baseline indicate that under critical conditions, both the degree and extent of hypoxia are more severe than indicated by earlier simulations.
  - b. The LIS Study proposed Phase III actions are a key component of the proposed TMDL, and the only component for which there is reasonable assurance of implementation. SWEM simulations indicate that these will be less effective in improving DO levels than originally anticipated.

- Response 35:**
- The concern raised regarding the low degree of effectiveness in improving DO levels using SWEM will be further evaluated by the LIS Study once the model is accepted by both States. Appropriate actions consisting of additional total nitrogen reductions and other non-treatment alternatives would be evaluated as noted in the final TMDL to achieve the DO standards in the Sound. As mentioned in response 34, this TMDL has been developed using the LIS 3.0 model. Future actions will be based upon the use of SWEM , once accepted.

A comparison of the 1988-89 simulations of the SWEM and the LIS 3.0 Model shows that the SWEM predicts lower dissolved concentrations than the LIS 3.0 Model. Therefore, the SWEM predicts more severe hypoxia conditions and lower DO concentrations in the post Phase III Actions predictions. However, the SWEM predicts the same order of magnitude of improvement from the Phase III Actions. Therefore, while the use of the SWEM may necessitate changes to the Phase III Actions, the SWEM will continue to support the Phase III Actions and the TMDL. The SWEM will also allow for the analysis of non-treatment alternatives such as outfall relocation and tide gates.

## **Embayments**

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- Comment 36:**
- a. There is no requirement to establish a nitrogen TMDL for the embayments into which those facilities discharge because the embayments are not on the State's list of impaired waters with respect to nitrogen or DO.
  - b. The embayments are only listed with respect to pathogens. By proposing a TMDL that essentially only applies to embayments within Management Zone 10, NYSDEC has overstepped its legal authority.

**Response 36:** The 303 (d) listing require the states to list those water bodies for which required technology based pollution controls are not stringent enough to attain or maintain compliance with applicable state WQS. The embayments meet applicable state WQS for DO and therefore are not listed on the state's 303 (d) list for DO. However, LIS is listed on the 303(d) list for DO and modeling results indicate that the flow of water from the embayments to the Sound carry pollutants, such as nitrogen. The transport of nitrogen out of the embayment and into the Sound contributes to the annual nitrogen budget of the Sound. TN has been linked to hypoxia (DO less than 3.0 mg/l) in the Sound. The point and NPS loads which contribute to such impairment are required to be reduced to attain WQS. The TMDL is a vehicle to achieve such reductions for attaining applicable DO standards in the Sound and to achieve them, the TMDL process can be extended to those areas that are not impaired, but contribute to the impairment of another water body such as LIS. Therefore, the embayments need not be on a 303 (d) list for DO to be effected by the LIS DO TMDL.

**Comment 37:**

- a. How much loads in terms of the TMDL can be assigned when we have very little knowledge of the transport of nitrogen into or out of these north shore pocket bays.
- b. It is unknown whether the harbors are sources of nitrogen to the Sound or vice versa. Most WPCPs in these harbors discharge into the head of the harbor. A substantial fraction of the nitrogen may never exit the harbors.
- c. It would seem reasonable to determine the impact, if any, these harbors may have on the Sound prior to imposing expensive advanced treatment on relatively small communities.
- d. Connecticut dischargers have been given the benefit of attenuation factor to account for biogeochemical process, which take discharged nitrogen "out of circulation". This (benefit of nitrogen attenuation) is not taken into account for the North Shore dischargers.
- e. Data, which is being collected in Hempstead Harbor, show a very strong correlation between low DO and incoming tides throughout the year. This is contrary to the assumption in the TMDL analysis that impacts from nitrogen loading from this embayment and this management zone have greater impacts on a per pound basis and therefore, the proposed exchange ratios should be reevaluated in light of new data.

**Response 37:** The LIS 3.0 Model was not developed to analyze the Sound's embayments. The NYDEC does not consider this to be a flaw in the analysis. The modeling results indicate that the inputs of TN to these embayments act as sources of nitrogen to the Sound. Accordingly, most of the nitrogen is transported out of the embayments to the Sound. Since the annual loads are the critical loads, temporary fluctuations in the loads are not considered important. While some nutrient uptake is probable in the embayments during the summer, those nutrients will be released later. Even though the Sound may be transporting nitrogen into the embayments at times; there will still be a net release of nitrogen from the embayment to the Sound.. The only way this assumption would be invalidated would be the presence of a constant uptake of nitrogen within an embayment which the Department cannot envision.

This is why there was no attenuation factor applied to the Sound embayments in New York or Connecticut.

**Comment 38:** The exchange rates developed without the benefit of attenuation factors will put Management Zones 10 and 11 at an unfair disadvantage as sources within each zone seek to trade (in either direction) with sources in other management zones. This would undermine the possibility of ever establishing a workable effluent-trading program.

**Response 38:** Coastal areas in both states have been treated equally and therefore the exchange rates developed for management zone 10 and 11 are appropriate. New York State is not advocating a trading program at this time since the State does not see the benefit nor the market for such a program.

## **Treatment**

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**Comment 39:** The proposed reduction in TN would require discharges to reduce TN beyond the limit of technology.

**Response 39:** The NYSDEC plans to develop allocation specifics while developing Management zone implementation plans which NYSDEC committed to develop within a year after the TMDL is accepted. These implementation plans would be developed after consulting with the various dischargers and communities in the management zones and determining the actual level of reduction that could be expected from each zone (No discharger will be required to go beyond the limit of technology). Inter-zone reallocations and negotiations are anticipated. The exchange ratios presented in the TMDL would be used to assure that the anticipated oxygen benefit to the Sound presented in the TMDL would not be compromised. Many of the allocation concerns expressed in the comments on the TMDL will have to be addressed in these zone by zone plans.

**Comment 40:** No documentation was provided to describe the calculations used to establish the WLA in the TMDL. Calculations shall be available for public review as defined in the state's continuing planning process (CPP). NYSDEC has failed to provide such documentation. Even CT's minimal description of point source calculations (done in 1993 for many point sources) is not provided by NY.

**Response 40:** The proposed TMDL has been revised and the baseline loads and WLAs for all the NYS facilities are listed in the Appendix C of the final TMDL

The TMDL describes how the allocations were calculated. In addition, during the development of the TMDL, NYSDEC met twice with the NYS discharges to LIS to describe how the WLA would be developed. At those meetings NYSDEC solicited comments and answered questions.

The WLA for each management zone represents 58.5% of the zone's cumulative point source load and 58% of the terrestrial nonpoint loads minus 10% of the total nonpoint source load from urban and agricultural land covers. The WLA was distributed to each point source using a uniform percentage rate for each zone. The percentage rate for each zone is the following:

Zone 7	61.1 %
Zone 8	58.5 %
Zone 9	58.5 %
Zone 10	64.0 %

Zone 11W	80.8 %
Zone 11E	84.0 %

All the loads in zones 8 and 9 are point sources.

## **Reasonable Assurance**

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- Comment 41:** TMDL should also include a description of what steps the State intends to take to provide “Reasonable Assurance” that, at a minimum, the 10% NPS reduction called for by the Phase III Nitrogen Reduction Plan/TMDL is achievable.
- Response 41:** The TMDL does include a “Reasonable Assurance” section which describes the steps the state is going to take to ensure a ten percent (10 %) NPS reduction as called for by the Phase III Plan and the TMDL.
- Comment 42:** The TMDL must incorporate a specific plan for how the allocated NPS reduction will be achieved. A monitoring program to track the effectiveness of these reductions should be in place.
- Response 42:** The NYSDEC plans to develop specifics while developing Management Zone Implementation Plans which NYSDEC committed to develop within a year after the TMDL is accepted. NYSDEC has determined that ten percent (10 %) reduction of NPS (urban and agriculture) load is achievable through aggressive NPS control source program (BMPs). This may include, but not limited to, Sand Filters, Extended dry Pond, Wet Pond, Extended Wet Pond, Filter Strips, Wetland and etc. In addition, the proposed TMDL provides local governments the flexibility to develop site-specific NPS control plans. A monitoring or effectiveness-tracking program should accompany this.
- Comment 43:** The TMDL does not include an Implementation Plan consisting of eight elements per USEPA published proposed revisions to the TMDL regulations. (40 CFR Part 130- August 1999).
- Response 43:** The USEPA has promulgated revised TMDL regulations. However, these regulations have not gone into effect yet. Therefore, the LIS DO TMDL has been developed in accordance with the USEPA TMDL regulations which are currently in effect.
- Comment 44:** The TMDL does not provide the required “reasonable assurance” that Phase IV measures that are necessary to achieve WQS will be implemented.
- Response 44:** As mentioned in the TMDL, for out-of-state sources, the USEPA would take appropriate measures (coordinate with other states, plan, implement nitrogen reduction goals and etc.) to meet the nitrogen targets as specified in the TMDL.
- Comment 45:** The TMDL does not provide reasonable assurance that reductions from NPS loads are enforceable, or will, in fact, be enforced.
- Response 45:** NYSDEC believes that the discussion of reasonable assurance in the TMDL is extensive and meets the requirement of the CWA.

- Comment 46:** Load allocation (LA) implementation relies upon implementation of existing programs. There is no documentation that these programs have improved water quality. There is no documentation that enforceable mechanisms have been implemented through existing programs and no mechanism is presented that describes when they will be implemented.
- Response 46:** The existing programs discussed in the Reasonable Assurance for Load Allocations section were presented to show that enforceable programs exist to assure the load reductions required by the allocations will be met. A performance assessment of these programs is not relevant to the TMDL. It is the authority these programs provide that is important to the TMDL and its implementation. The reasonable assurance section in the TMDL outlines monitoring and tracking methods such as existing embayment monitoring networks to ensure that LA targets are being met.
- Comment 47:** The inclusion of anticipated reductions in atmospheric loadings that are generated by out-of-basin sources appears unrealistic and fails to meet any test of “reasonable assurance”.
- Response 47:** As mentioned in the TMDL, an eighteen (18) percent atmospheric reduction in nitrogen is possible through the implementation of Clean Air Act (CAA). This estimate is consistent with the recent Regional Acid Deposition Model (RADM) estimates associated with the regional NO<sub>x</sub> SIP (State Implementation Plan) . A rough estimate of reductions indicate that CAA would reduce enriched nitrogen transport by five (5) percent. This is our best estimate of the nitrogen reduction that can be achieved through CAA. The nitrogen reduction estimate would be refined, as the new information becomes available in the future.
- Comment 48:** TMDLs for the major LIS tributaries (East River, Harlem River, Hudson River, Kills, and etc.) should be developed in order to provide the reasonable assurance that *point and* NPS reduction measures are implemented.
- Response 48:** The current TMDL provides reasonable assurances that point source and nonpoint sources will be implemented. No additional TMDL’s are required for the tributaries unless they are also listed on the 303(d) list.
- Comment 49:** The TMDL should clearly identify updated information (atmospheric nonpoint) on the load that is not reflected in modeling analyses used to support the TMDL development.
- Response 49:** The updated loading information is provided in Tables 1 and 2 of the TMDL document. The LIS 3.0 model load analysis was concerned with an accurate estimation of the nutrient load delivered to LIS. This was adequate to determine the response of LIS to nutrient inputs and to help assign reduction levels. The TMDL, however, is concerned with allocating the reduction levels among sources, including sources within the tributary category used in the LIS 3.0 analysis. Therefore, the main update in describing loads found in the TMDL is the apportionment of loads into several categories (terrestrial runoff, atmospheric deposition, and point sources) and geographic segments..
- Comment 50:** The quantification of tributary loads and NPS loads on which the draft TMDL is based appears to be extremely poor and inadequate to support a LA.

**Response 50:** As mentioned in the draft TMDL, the NYSDEC and the CTDEP, made a commitment to develop a TMDL for LIS as part of the *Phase III Actions for Hypoxia Management*. The NYSDEC made the commitment knowing that our knowledge and understanding of the LIS and the processes influencing hypoxia were far from complete. The NYSDEC, however, did believe that the knowledge and understanding NYSDEC derived from the LIS Study was sufficient to require the limitation of nitrogen discharges to the Sound and provided us with enough information to develop a TMDL that would meet the mandated requirements of Section 303(d) of the CWA. The provision for periodic review every five years reflects the limits of our understanding and allows for appropriate adjustments to the TMDL as our understanding of the hypoxia problem in the Sound improves.

Years of further study may very well improve our understanding of the LIS. However, we do not believe that the promise of an improved understanding justifies the delaying of management actions that were developed and agreed to by the LIS Management Conference. We have no reason to expect that a better understanding of the system would radically change these actions.

**Comment 51:** The categorization of NPS loads is inappropriate and should be revised. NYCDEP questions the legitimacy of identifying a portion of nonpoint loads as “pre-colonial” and excluding terrestrial-based loads which result from atmospheric deposition from reduction targets.

**Response 51:** The categorization of NPS loads into pre-colonial, terrestrial and atmospheric components is consistent with our current level of scientific understanding of the NPS issues<sup>3</sup>. We recognize that there would be nitrogen reduction in the natural/precolonial component of the atmospheric deposition through the application of BMPs. As mentioned in the TMDL, precolonial estimates are sensitive to the methods used to estimate natural loadings to the sound. The most recent estimates of the precolonial load of nitrogen are lower than the estimates used in the precolonial model run. Due to the uncertainty associated with the precolonial loads, the LIS study did not estimate these reductions to avoid the introduction of another level of complexity and uncertainty in the TMDL analysis

We agree that terrestrial component of the atmospheric deposition would be further reduced through the provisions of Clean Air ACT (CAA) from the point sources such as - at the stacks and further from the application of BMPs. Please note that these reductions through the CAA and BMPs have been taken in account to achieve the reduction target. Please see Section VI B - Out-of-Basin sources and Phase IV of the TMDL document for detail.

**Comment 52:** Combined Sewer Overflows (CSOs) are categorized as LA. CSOs are point sources and should be part of the WLA.

**Response 52:** The revised TMDL addresses this issue. The NYC CSOs are now considered point sources and are addressed in the WLA. The treatment of Connecticut CSOs are explained in the revised TMDL.

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<sup>3</sup> Please see Page 48 of the TMDL for literature citation.

**Comment 53:** The TMDL proposed reduction targets for CSO loads are inequitable, particularly when considered in light of the reduction goals established for NPSs in Management Zones other than Zones 8 and 9 (Zones 8 and 9 include areas of NYC adjoining the Upper and Lower East River). By classifying a large portion of NPS loads as either “pre-colonial” or “atmospheric” the TMDL effectively lowers reduction targets for nonpoint loads. This relaxes nonpoint load reduction requirements for all Zones other than Zones 8 and 9. This is evidence of less than a full commitment to seriously addressing nonpoint load reduction equivalence.

**Response 53:** The CSO loads for Management Zones 8 and 9 are based upon the results of the Rainfall Runoff Modeling Program (RRMP), developed by HydroQual Inc. The modeling results have been verified against actual field data. The CSO loadings have not been categorized into pre-colonial, terrestrial and atmospheric loadings. The TMDL considers that all loads from the NYC area (zones 8and9) be man induced because of the intense development of the area. If a justifiable estimate of the pre-colonial contribution from this area is provided NYDEC will consider it in the periodic review of the TMDL analysis.

**Comment 54:** CSO bypassing does not seem to be directly addressed by the TMDL management plan as nutrient (nitrogen) pulses associated with local rainfall events can produce immediate response in surface production in the Western Sound which is exported out of the surface mixed layer to contribute to BOD of bottom waters.

**Response 54:** The LIS 3.0 analyses did not show a strong relationship between hypoxia and the seasonality of nitrogen loads to the Sound. While hypoxia generally occurs between June and September, nitrogen loadings throughout the year contribute to the nitrogen available for uptake by the phytoplankton prior to and during the periods of hypoxia. Since the extent of algal growth is dependent on annual, as well as seasonal, cycles it is the annual load of nitrogen that is considered important. CSO discharges were considered in determining the annual loads to the Sound but the episodic nature of the CSOs were not.

**Comment 55:** The LA for NPS will require adequately funded programs in order to provide reasonable assurance that meaningful load reductions can be achieved. The TMDL should include a written discussion of how the NPS reductions will be funded (i.e. local funding, State or federal funding, use taxes, etc.).

**Response 55:** The NYSDEC plans to develop allocation specifics while developing management zone implementation plans which NYSDEC promised to develop within a year after the TMDL was accepted. These implementation plans would be developed after consulting with the various dischargers and communities in the management zone. How the nonpoint source reductions will be funded will be addressed in these plans. The TMDL discusses various funding sources.

## **Non-Treatment Alternatives**

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**Comment 56:** TMDL Report dismissed the tidal barrage alternatives on the basis of dated and dubious information. The results of the current analysis of tide gates using SWEM indicate that tide gates increase D.O. significantly (more than nitrogen removal) and they are ten times more cost effective than nitrogen removal. Therefore, the assessment of tide gates (pg. 27, Para.3) should be removed or revised and tide gates be explicitly listed amongst the alternative measures to be considered in

**Response 56:** The section of the TMDL that deals with non-treatment alternatives has been rewritten. The list of alternatives has been revised and tide gates are explicitly listed among the measures to be considered in future evaluations as additions to nitrogen control.

**Comment 57:** Relocate the NYC outfalls.

**Response 57:** This is also an alternative which was preliminarily assessed in the revised TDML.

**Comment 58:** a. There is significant doubt as to the effectiveness of aeration/mixing as a last step to attain the DO standard beyond 3.5 mg/l. This should be excluded from the TMDL since it has not been proven to work.

b. The TMDL relies on the anticipated reduction of the DO standard and mixing/aeration. Mixing/aeration is an implausible alternative. Together they don't constitute a MOS.

c. Mixing/aeration is not a nitrogen control measure. CWA requires treatment of sewage before it leaves the pipe. There is doubt about the practicality of this alternative.

d. Mixing/aeration will disrupt stratification and may have long term and destructive consequences for marine habitat in the Sound. Aeration is inappropriate for the TMDL.

e. Aeration/Mixing is proposed as a means of achieving WQS. The proposed Phase III removal goals, and the identification of aeration/mixing (rather than other available methods), needs to be supported by environmental and economic analyses per 40 CFR 125.3(f).

f. MOS factor description is not adequately documented with respect to aeration. The basis of 1988-89 being worse than average does not allow a determination of the point where N reductions will meet WQS. The 88-89 conditions should be as well documented as the numeric loadings of nitrogen.

**Response 58:** Mixing and aeration in the revised TMDL is one of several non-treatment alternatives that will be evaluated as Phase V of the phased approach to meet the current DO standards throughout the Sound. CWA 40 CFR 125.3(f), allows the regulatory agencies to use non treatment alternatives for attaining WQS when technology treatment requirements are not sufficient to achieve the standard. As mentioned in the TMDL, nitrogen reductions at the current limit of technology to the sources within the New York and Connecticut portions of watershed will not fully achieve the DO standard. Therefore, the use of non treatment alternatives to achieve the standard is an acceptable alternative and is consistent with CWA. The evaluation of all non-treatment alternatives outlined in the revised TMDL will include a MOS.

**Comment 59:** Non-treatment techniques may offer better ways to reach standards, or maximize DO, and therefore should be considered concurrently with treatment alternatives in Phase III.

**Response 59:** The Phase III TN reduction target, 58.5% of the point and non point source loadings, are the core of the TMDL and both the states are committed to its implementation. The non-treatment alternative therefore can not be substituted for Phase III. The final TMDL contains the possible techniques and technologies that can achieve applicable WQS after the implementation of Phase III. These technologies will be further evaluated and their appropriateness will be decided during future assessment and revisions of the TMDL. Please see Table 9, “Alternative strategies for hypoxia management”.

**Comment 60:** Consideration of non treatment alternatives should be undertaken sooner, rather than later in the planning process using SWEM model.

**Response 60:** The use of non-treatment alternatives will be evaluated as the other phases of the TMDL are being implemented. The States do not plan to delay the analysis of the non-treatment alternatives.

## **Margin Of Safety**

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**Comment 61:** The draft TMDL does not properly address the issue of providing the “margin of safety” required for TMDL development.

**Response 61:** The draft TMDL adequately addresses the issue of “margin of safety” required for the development of the TMDL. The Margin of safety in the TMDL is implicit. By using the worst year on record (1988-89) in the analyses and by relying on conservative estimates when ever estimates are used, the anticipated DO improvements will be better than the predicted improvements upon which the decisions were made. The margin of safety lies in the assumption that the DO improvements will be better than the improvements presented. Alternative technologies with sufficient Margin of Safety will be selected to attain the applicable DO standards in the Sound. These technologies will be further evaluated.

**Comment 62:** The TMDL does not make the required allowance for reserve capacity to allow for future growth and does not include a credible analysis of the potential for future growth.

**Response 62:** The current TMDL regulations do not specifically require a reserve capacity be set a side for future growth.

As stated in the TMDL, the WLA/LA is a cap on nitrogen discharges. Once the WLA/LA is achieved, any population growth and development would need to be offset by additional treatment to stay within the WLA/LA cap. For example, a growing community might need to further upgrade wastewater treatment capabilities to achieve additional nitrogen removal. It should be noted, however, that the watershed is generally well developed already and population growth is forecasted to be relatively modest.

## **TRADE**

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**Comment 63:** The draft TMDL indicates that load “trading” between zones “is expected to be part of the final, cost-effective implementation strategy.” See Section VI.A.1, NPS. 21-22. The TMDL needs to provide further clarification of the proposed trading concept.

**Response 63:** While the TMDL mentions the possibility of trading programs as a part of the strategy for implementing the TMDL, trading is not a required component of the TMDL and potential programs are not described in the document. Any trading programs that are established in New York would be done after appropriate public review and comment. The TMDL does, however, identify the exchange ratios that any trading program would need to abide by.

**Comment 64:** The TMDL, if and when finalized, must specifically state that “trades”, whether done between point sources, point and NPS, and/or between management zones, are allowed under the TMDL and will not require a change in the TMDL to go forward.

**Response 64:** NYSDEC does not believe there is a market for trading between the New York dischargers. However, NYSDEC does foresee a possible need to reallocate some of the loads between management zones to address some of the zones inability to meet their reductions. These re-allocations will be addressed in the management zone implementation plans. Any re-allocation between zones will use the exchange ratios specified in the TMDL to assure that the anticipated oxygen benefit to the Sound presented in the TMDL would not be compromised. The re-allocations will not require the re-issuance of the TMDL. Re-allocation between point and NPSs will require a revision to the TMDL.

**Comment 65:** The “Exchange Rates” shown in Table 6 of the Draft TMDL must be eliminated because they are based on a misapplication of LIS 3.0 model outputs due to a misunderstanding of the model’s boundary conditions in the vicinity of the North Shore embayments. Failure to do so will probably prevent any meaningful achievement of trades.

**Response 65:** The LIS 3.0 model for developing the TMDL was developed and applied to simulate the movement of nutrients in the Sound. There were no boundary conditions set for the North Shore embayments. However, the model did use a few grid segments in each embayment to provide input to the model for the interaction of the embayments with the Sound. The LIS 3.0 model was not developed to model the embayments. The Model reproduced the temporal and spatial trends in observed data (in terms of pollutant transport and transformation) and successfully simulated 1988-1989 conditions. The Model, along with its method for handling the North Shore embayments, was also approved by the LISS MEG for use as a predictive tool to the LIS. .

## **COST**

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**Comment 66:** The cost of nitrogen reduction upgrades at the Management Zone 10 North Shore wastewater treatment plants have consistently been underestimated by USEPA and NYSDEC, in part because they have based their cost estimates on technologies different than those in use by the small plants in Management Zone 10.

**Response 66:** During the development of the Phase III Actions for Hypoxia Management plan, all the dischargers were given an opportunity to submit cost-estimates to achieve 58.5 % TN reduction. Dischargers were informed that the cost-estimates be based upon the site-specific applicable technology to achieve the Phase III nitrogen reduction target. The cost-estimate data submitted by the dischargers was used to conduct a “DO improvement versus cost benefit

analysis” to maximize the DO improvement per dollar spent on reducing TN. These cost-estimates could be revised as more detailed facility planning and design are performed.

**Comment 67:** The un-funded federal/State mandates not only will result in significantly increased local costs, but could also block development and lead to significant erosion in local support for Phase III Nitrogen Reduction Plan and the LIS Study CCMP. In addition, the TMDL will create an inequity among residents who utilize septic and sewer systems. The TN reduction cost will be born by the latter (residents connected to the sewer system) while residents who utilize septic systems essentially get off free.

**Response 67:** The State of New York is providing funds to localities to help implement the TMDL through the Clean Air / Water Bond Act and other programs such as the Costal Zone Management Program and other nonpoint source control programs. The cost inequities between the sewered and unsewered areas of Long Island will have to be addressed in the management zone implementation plans that will be developed.

## **LEGAL ISSUES**

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**Comment 68:** The phased approach is an illegal application of the TMDL. The CWA does not allow for incremental achievement of WQS (WQS) through successive approval of TMDLs that fall short of the WQS.

**Response 68:** The Phased approach used in the current TMDL is consistent with guidance contained in “Guidance for Water Quality-based Decision: The TMDL Process – April 1991” (pages 20 thru 22). The TMDL has been developed to fully attain the applicable DO standard of 5.0 mg/l. in New York and 6.0 in Ct. It does not propose incremental achievement of the DO standard through successive approval of TMDLs that fall short of the WQS.

**Comment 69:** The TMDL is a Type I action under SEQR. The impact of the TMDL, including the implementation measures and mixing/aeration, will have a significant impact on the environment. An Environmental Impact Statement (EIS) in accordance with Section 303(d) of the CWA addressing major issues, and comparison of alternatives and evaluation is required, and should be prepared.

**Response 69:** A TMDL is not a type I action under New York's State Environmental Quality Review Act (SEQR). The TMDL is a calculation of the load reductions required to meet WQS. The TMDL outlines how those load reductions will be accomplished and what additional actions will be necessary to meet the WQS. The actions outlined in the TMDL may be subject to the SEQR process, but the TMDL is not. The use of alternative technologies will probably require the development of an Environmental Impact Statement (EIS).

**Comment 70:** New York State’s most recent CPP document completed in 1985 does not “clearly describe” the procedures for implementing TMDLs (especially for LIS) in the State as required in 40 CFR. §130.7(a). It does not describe any process for public review of proposed TMDLs. The proposed TMDL was developed in the absence of a §303(d) process having been publicly described in New York’s CPP.

- Response 70:** Despite the noted deficiencies in the CPP document, NYSDEC posted the availability of TMDL for public review in the ENB on November 24, 1999. A forty-five day public review period was established for soliciting comments from stakeholders. In addition, the TMDL was made available to public on NY State's Website. Subsequent to this, NYSDEC also held three public meetings to discuss and answer questions on the TMDL. By so doing, NYSDEC has complied with the 40 CFR §130.7(a). The TMDL was developed consistent with Section 303(d)(1)(C) as LIS was listed in the 303(d) listings (1992,1994,1996 and 1998) for hypoxia and a priority for developing a TMDL.
- Comment 71:** The TMDL relies on a cost-sensitive analysis, an approach not specifically allowed by Sec 303(d).
- Response 71:** The current DO standards will not be met by in-basin treatment alternatives. After studying the limit of technology (LOT) scenario, all the STPs within the NY and CT. treating to LOT, it was obvious that the WQS would not be met. Since additional measures would be needed to meet standards, both the phased and cost effective approach was justified. A comparison of the cost effective and LOT scenarios shows that the 58.5% reduction achieves almost the same level of water quality improvements as the LOT scenario. The incremental DO improvement of the LOT scenario over the 58.5 % reductions is only 0.1 mg/l in the New York waters. The estimated cost of the LOT scenario was \$ 2.5 billion while the cost effective approach was estimated at \$650 million. If the LOT scenario was chosen the remaining DO deficit in the New York waters would be 1.9 mg/l. With the cost effective scenario, the remaining oxygen deficit will be 2.0 mg/l.
- Comment 72:** If the TMDL is finalized according to the proposed schedule, the lack of adequate public participation and dialogue will invalidate the TMDL.
- Response 72:** The TMDL was released to the public on November 16, 1999. A forty-five day public review period was established for soliciting comments from stakeholders. At the request of several stakeholders, the comment period was extended for another thirty-one days. The comments received after the due date (February 9, 2000) have been included in the response summary. The TMDL was also made available to public on the NY State's Website. Subsequent to this, NYSDEC also held three public meetings to discuss and answer questions on the TMDL. NYSDEC believe that sufficient time was provided to the interested parties for the review of the TMDL and for public input/participation aspect of the TMDL process.
- Comment 73:**
- a. The TMDL constitutes a rule making under the state administrative procedure act (SAPA) since it is intended to establish a legally binding fixed numerical standard to be "applied equally to each discharger" without regard to individual circumstances or mitigating factors
  - b. NYSDEC did not prepared a Regulatory Impact Statement as a part of SAPA in connection with TMDL and no cost-benefit analysis was done. Therefore, NYSDEC has violated New York Law
- Response 73:** While some of the actions outlined in the TMDL may be subject to the New York State

Administrative Procedures Act (SAPA), the TMDL is not.

**Comment 74:** The continuation of the rigid fixation on a 58.5% reduction in each zone is arbitrary and capricious. It is not supported by any valid scientific evidence. In addition, due to varying ratios of point to NPSs between various Management Zones, the uniform application of 58.5% reduction target to all management zones continues to be unfair to those management zones (such as 10 and 11 on the North shore of long Island) which have higher levels of NPS.

**Response 75:** Application of “equal percent removal“ is one of the waste allocation methods approved by EPA that can be applied to achieve WQS. The 58.5% removal was arrived at through a “knee of the curve” cost effectiveness analysis presented in the Framework for developing the proposed Phase III Nitrogen Reduction Targets, January 1997.

NYSDEC recognizes the fact that some zones have higher NPS loadings than the point source loadings and in others it is vice versa. In this situation, the uniform application of 58.5% reduction target to all management zones is the only prudent way to follow for avoiding such conflict. These zones with high NPS loadings still have the option of removing more NPS loadings than the Point Sources. The ratio of reducing Point Source and NPS need not be the same i.e.58.5%, it could be different as long as TN reduction target is met within the Zone

**Comment 76:** Implementation of the WLAs in the TMDL could lead to a violation of anti-backsliding. The five-year target for Zone 8 is higher than current permit limits.

**Response 76:** The TMDL will not allow backsliding of any facility. The five year target for management zone 8 is higher than the current permit because the baseline loads in zone 8 were adjusted after the current discharge permits for those zones were issued. The current SPDES permit limits were developed consistent with the “no-net increase” policy of the Status Report and Interim Actions for Hypoxia Management (1990). The limits are representative of effluent discharge limits and treatment plant performance prior to land based sludge removal and implementation of BNR at the four Upper East River WPCPs. The baseline shown in Table 6 and the five year target include the nitrogen centrate baseline load that was subsequently added (1992).

**Comment 77:** The TMDL, as a whole, is not consistent with the USEPA’s most recent requirements and guidance. The reviewer has made suggestions to improve the Draft TMDL consistence with current guidance.

**Response 77:** The proposed TMDL document needs not be consistence the EPA’s most recent requirements and guidance as the proposed TMDL will be prepared and submitted to USEPA for their approval before the final revision to the TMDL requirements. The current TMDL requirements will not take effect until Year 2002.

**Comment 78:** There is no need to do a TMDL now - delaying or eliminating the TMDL will not delay the achievement of the nitrogen reductions called for in the Phase III hypoxia management plan.

**Response 78:** As mentioned in the draft TMDL, NYSDEC and CTDEP made a commitment to develop a

TMDL for LIS as a part of the Phase III Actions for Hypoxia Management plan. NYSDEC made this commitment knowing that our knowledge and understanding of LIS was far from complete. Despite this, NYSDEC believed that sufficient information is available to develop a TMDL that would meet the requirement of Section 303(d) of the CWA. The provision for periodic review every five years reflects the limits of our understanding and allows for appropriate adjustments to the TMDL as our understanding of the hypoxia problem in the Sound improves.

Years of further study may very well improve our understanding of the LIS. However, we do not believe that the promise of an improved understanding justifies the delaying of management actions that were developed and agreed to by the LIS Management Conference. NYSDEC has no reason to expect that a better understanding of the system would radically change these actions.

The adoption of the TMDL does not mean the end of research or study of LIS and its watershed. The NYSDEC acknowledges the need for long term research. Even if we were secure in our knowledge of the system, more study would be required to assess and verify the effectiveness of management controls. Research and study will continue.

## **Recent/future monitoring**

- Comment 79:** New water quality data, now being collected in Hempstead Harbor on a continuous 24-hours, seven days a week basis should be included in the ongoing assessment of DO conditions in the Sound and implementation of the TMDLs.
- Response 79:** The LIS 3.0 model used in the development of current TMDL is based on the ambient data collected in the 1980s. The new model, SWEM ,will be used in the future. The data collected in Hempstead Harbor should be reviewed in the periodic reviews to determine the value of the data with respect to running the SWEM model. The first review is scheduled for 2003.
- Comment 80:** This kind of monitoring should be expanded to other locations in the Sound.
- Response 80:** The data may be useful to understand the embayments, but may have limited use in analyzing the open waters of the Sound.
- Comment 81:** The SUNY has proposed a program of research for embayments (Manhasset Bay, Hempstead Harbor and etc) to the NY State Legislature. These embayments have been ignored by the LIS Study. Such studies are warranted to make judgements concerning pollution remediation programs. We would like to accommodate NYSDEC needs as we develop our plan and discuss the proposal with the legislature.
- Response 81:** Your initiatives to secure funding from NY State Legislature for research toward determining the appropriate pollution remediation for these embayments is a worthwhile effort. Please keep the LIS office informed of your efforts.
- Comment 82:** Various State and Federal agencies should join with academic institutions in the region to

institute effective and integrated long-term investigation of basic ecosystem properties of LIS.

**Response 82:** The adoption of the TMDL does not mean the end of research or study of LIS and its watershed. The NYSDEC acknowledges the need for long term research. Even if we were secure in our knowledge of the system, more study would be required to assess and verify the effectiveness of management controls. Research and study will continue.

**Comment 83:** A recent grant to the Suffolk Co. Dept. of Health Services to study the embayments of the north shore of Long Island would aid in updating the data base and provide the confidence level with regard to the NPS issue. The study can link the data gap where the LISS model did not forecast the impact of conversion chemistries on the determination of what actually is the load from an embayment.

**Response 83:** LIS Office and NYSDEC would work with Suffolk County in consultation with HydroQual, Inc., to determine if the noted information is useful to future evaluations.

**Comment 84:** Effluent sampling is not representative of the actual amount of nitrogen discharged in the sampling period. Currently, sampling is weekly batch with the highest effluent concentration. This kind of sampling is not representative of what actually is happening. It is suggested that the sampling requirement be changed to flow proportioned composite sampling.

**Response 84:** This is a permitting issue and needs to be addressed through the individual facility permits. The development of the TMDL used the best data available to assess the nutrient loading and to determine appropriate WLA and LA. If more representative data is available in the future, it will be used in future reviews of the TMDL.

## **Miscellaneous**

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**Comment 85:** TMDL should be a daily load – not annual.

**Response 85:** Hypoxia in LIS occurs from the decay of phytoplankton. It is not sensitive to daily or short-term (seasonal) nitrogen load to the Sound. Nitrogen loading over the whole year contributes to the pool of nitrogen available for phytoplankton uptake from June through September. The modeling results indicate that there is no strong relationship between seasonal loadings of TN and hypoxia. It is the annual load that is considered important. Expressing the WLA and LA in terms of annual load is consistent with 40CFR 130.2(I). The WLAs in the appendix are expressed in pounds/day.

**Comment 86:** How will the TMDL/WLA be implemented within the SPDES permit process?

**Response 86:** Upon issuance of the TMDL/WLA, SPDES permits in the LIS drainage basin will be re-evaluated in accordance with NYSDEC's Environmental Benefit Permit Strategy (EBPS). The EBPS priority score will increase significantly to reflect the requirements of the TMDL/WLA. As a result, the overall position of the LIS permits relative to the statewide SPDES priority ranking list will increase.

When the LIS SPDES permits fall within the top ten percent of the statewide priority ranking list, NYSDEC will institute a comprehensive modification review for those permits. As part of this comprehensive review, SPDES conditions to implement the TMDL/WLA will be analyzed and incorporated into the permits.

**Comment 87:** Very significant variations in nitrogen loads documented in LIS 3.0 work do not correspond to variations in DO, suggesting that there are other, more important influences on DO in LIS that are not considered in TMDL development.

**Response 87:** The TMDL has considered all the important factors affecting hypoxia in LIS. The TMDL does not suggest that nitrogen is the only factor effecting hypoxia. The TMDL recognizes that stratification in the water column and weather contribute to hypoxia as well as high levels of ambient nitrogen. However, the ambient levels of nitrogen are controllable. The TMDL attempts to decrease the levels of ambient nitrogen. The stratification of the water column may also be controllable and some of the non-treatment alternatives that will be evaluated are designed to disrupt the stratification.

**Comment 88:** The inter annual variations in summer time bottom DO in the western Sound and water column stratification would seriously confound any assessment of abatement measures.

**Response 88:** For this reason, modeling as well as monitoring will play an important role in th assessment of abatement measures.

**Comment 89:** Additional needs for nitrogen load reductions to address water quality in LIS can be anticipated now and a realistic and comprehensive program should be developed.

**Response 89:** The TMDL requires the nitrogen load reductions that the States of NY and CT have the authority to require and suggests further reductions for the “out-of-basin” sources where they have no authority. The revised TMDL strongly suggests that EPA use its authority to pursue the suggested reductions in the “out-of-basin” atmospheric, point and land based non-point nitrogen loads.

**Comment 90:** NYCDEP is concerned that the TMDL development process does not acknowledge the totality of the treatment and/or water quality issues it will need to address for the East River, Harlem River, Hudson River, and Harbor. The East River should not be the subject of two separate TMDLs while other LIS tributaries are subjected to none

**Response 90:** This TMDL is being developed for LIS. The need for Harbor TMDLs will be evaluated in the future. The reductions required by the LIS TMDL will be considered in the evaluation of Harbor TMDLs. This does not preclude further reductions if they are required by other Harbor TMDLs. However NYSDEC does not foresee further nitrogen reductions since phytoplankton in the Harbor seems to be light limited.

**Comment 91:** NYCDEP has made considerable progress in reducing nitrogen discharges from its East River treatment plants and has undertaken a significant nitrogen reduction program. Further nitrogen

treatment reduction progress will be increasingly difficult and expensive; particularly given the space-efficient design and limitations of NYCDEP treatment plants. A treatment strategy has limitations on how much DO improvement can be achieved, and more planning is required.

**Response 91:**

NYSDEC acknowledge NYCDEP's efforts for making considerable progress in reducing nitrogen discharges from its East River treatment plants and undertaking a significant nitrogen reduction program. This concern reflects the need for a periodic (every 5 years) review of the TMDL and the analyses it is based upon.

**APPENDIX A  
LIST OF ACRONYMS**

<b>BMP</b>	<b>Best Management Practice</b>
<b>CAA</b>	<b>Clean Air Act</b>
<b>CCMP</b>	<b>Comprehensive Conservation Management Plan</b>
<b>CPP</b>	<b>Continuing Planning Process</b>
<b>CSO</b>	<b>Combine Sewer Overflows</b>
<b>CTDEP</b>	<b>Connecticut Department of Environmental Protection</b>
<b>CWA</b>	<b>Clean Water Act</b>
<b>DMR</b>	<b>Discharge Monitoring Report</b>
<b>DO</b>	<b>Dissolved Oxygen</b>
<b>DOW</b>	<b>Division of Water</b>
<b>ENB</b>	<b>Environmental Notice Bulletin</b>
<b>HEP</b>	<b>Harbor Estuary Program</b>
<b>LA</b>	<b>Load Allocation</b>
<b>LIS</b>	<b>Long Island Sound</b>
<b>MEG</b>	<b>Model Evaluation Group</b>
<b>NYC</b>	<b>New York City</b>
<b>NYSDEC</b>	<b>New York State Department of Environmental Conservation</b>
<b>STP S</b>	<b>ewage Treatment Plant</b>
<b>SWEM</b>	<b>System Wide Eutrophication Model</b>
<b>TMDL</b>	<b>Total Maximum Daily Load</b>
<b>TN</b>	<b>Total Nitrogen</b>
<b>USEPA</b>	<b>United States Environmental Protection Agency</b>
<b>WLA</b>	<b>Waste Load Allocation</b>
<b>WQS</b>	<b>Water Quality Standards</b>

**APPENDIX B**  
**USEPA COMMENT LETTER**

Robert Smith, Chief  
Water Management Bureau  
Connecticut Department of Environmental Protection  
79 Elm Street  
Hartford, CT 06106-5127

NG Kaul, Director  
Water Management Division  
New York State Department of Environmental Conservation  
Albany, NY 12233-3508

Dear Mssr. Smith and Kaul:

On February 5, 1998, the Long Island Sound Study (LISS) Policy Committee adopted the LISS *Phase III Actions for Hypoxia Management*—an ambitious plan to reduce the amount of nitrogen from the Connecticut and New York portions of the Long Island Sound watershed by 58.5 percent, and to administer and enforce the effort through the development of a Total Maximum Daily Load (TMDL) in conformance with Section 303(d) of the Clean Water Act.

In November 1999, the Connecticut Department of Environmental Protection (CTDEP) and the New York State Department of Environmental Conservation (NYSDEC) released *A Total Maximum Daily Load Analysis to Achieve Water Quality Standards for Dissolved Oxygen in Long Island Sound* for public comment. This is to provide you with the joint comments of the U.S. Environmental Protection Agency's New England and Region 2 offices on the draft TMDL.

We recognize the scope and complexity of the TMDL. The effort is a model for integrating the watershed approach, exemplified by the National Estuary Program, with the other elements of our clean water programs. We want to thank you and your staffs for your willingness to work with EPA during its development.

Our enclosed comments are provided to assist you in finalizing the TMDL for submission to EPA consistent with the statutory and regulatory requirements contained in Section 303(d) of the Clean Water Act, EPA's implementing regulations at 40 CFR § 130.7, and EPA guidance on TMDLs. Comments are organized in each of the 13 areas that will be reviewed to determine if a submitted TMDL meets the requirements of CWA § 303(d) and 40 CFR § 130.7(b) for approval.

Please let us know if you have any questions on our comments. Our final review will also consider the public comments submitted on the TMDL and the responses (including TMDL revisions) to those comments. We look forward to receiving the final TMDL and to building upon the progress we have made.

Sincerely,

Linda A. Murphy, Director  
Office of Ecosystem Protection  
EPA-New England

Kathleen C. Callahan, Director  
Division of Environmental Planning and Protection  
EPA Region 2

Enclosure

**EPA COMMENTS ON DRAFT LONG ISLAND SOUND TMDL****REVIEW ELEMENTS OF TMDLs**

*Section 303(d) of the Clean Water Act (CWA) and EPA's implementing regulations at 40 C.F.R. § 130 describe the statutory and regulatory requirements for approvable TMDLs. The following information is generally necessary for EPA to determine if a submitted TMDL fulfills the legal requirements for approval under Section 303(d) and EPA regulations, and should be included in the submittal package. Use of the verb "must" below denotes information that is required to be submitted because it relates to elements of the TMDL required by the CWA and by regulation.*

**1. Description of Waterbody, Pollutant of Concern, Pollutant Sources and Priority Ranking**

*The TMDL analytical document must identify the waterbody as it appears on the State/Tribe's 303(d) list, the pollutant of concern and the priority ranking of the waterbody. The TMDL submittal must include a description of the point and nonpoint sources of the pollutant of concern, including the magnitude and location of the sources. Where it is possible to separate natural background from nonpoint sources, a description of the natural background must be provided, including the magnitude and location of the source(s). Such information is necessary for EPA's review of the load and wasteload allocations which are required by regulation. The TMDL submittal should also contain a description of any important assumptions made in developing the TMDL, such as: (1) the assumed distribution of land use in the watershed; (2) population characteristics, wildlife resources, and other relevant information affecting the characterization of the pollutant of concern and its allocation to sources; (3) present and future growth trends, if taken into consideration in preparing the TMDL; and, (4) explanation and analytical basis for expressing the TMDL through surrogate measures, if applicable. Surrogate measures are parameters such as percent fines and turbidity for sediment impairments, or chlorophyll *a* and phosphorus loadings for excess algae.*

The TMDL must clearly and appropriately distinguish point sources from nonpoint sources of nitrogen and carbon to the Sound. For example, loadings from combined sewer overflows (CSO) and storm water outfalls are currently included in the general nonpoint source category. Since these sources discharge to receiving waters via discreet conveyances (i.e., pipe outlets) they are by definition point sources regardless of whether they are currently subject to requirements of NPDES permits, and should typically be included with the point sources.

However, given the geographic scale of the LIS TMDL and the land use-based approach used to estimate loadings, we understand that it is not feasible to meaningfully separate point source storm water runoff from nonpoint source runoff because of the overlap that exists between these two source categories. Therefore, EPA agrees that it is reasonable, in this case, to include the storm water in the nonpoint source category when reporting loadings. However, the TMDL should discuss the fact that the reported nonpoint source loadings inadvertently include some point source storm water and why it was not feasible to separate them.

With respect to CSO loadings, the TMDL should include these loadings in the point source category wherever possible. For example, it appears that loadings from NYC CSOs have been quantified and, therefore, could be reported as a point source. For CT CSOs, it is unclear how these loadings have been accounted for in the overall loading. Please clarify the treatment of CSOs in CT in regard to loadings from sewage treatment plants and from storm water and describe why they have not been identified as a separate source. If it is possible to estimate the CSO loadings from Connecticut communities, such loadings should be included in the point source category.

Section V. B.

Tables 1 and 2 (pp. 11 & 12) – The footnotes that had been included at the bottom of Table 1 in earlier drafts have been deleted, apparently inadvertently. They should be restored, since the table itself contains footnote references. In addition, CSO discharges continue to be presented in both tables, incorrectly, as nonpoint source rather than point source discharges (they are the numbers to which footnote “c” is attached).

## **2. Description of the Applicable Water Quality Standards and Numeric Water Quality Target**

*The TMDL submittal must include a description of the applicable State/Tribe water quality standard, including the designated use(s) of the waterbody, the applicable numeric or narrative water quality criterion, and the antidegradation policy. Such information is necessary for EPA’s review of the load and wasteload allocations which are required by regulation. A numeric water quality target for the TMDL (a quantitative value used to measure whether or not the applicable water quality standard is attained) must be identified. If the TMDL is based on a target other than a numeric water quality criterion, then a numeric expression, usually site specific, must be developed from a narrative criterion and a description of the process used to derive the target must be included in the submittal.*

Section III. C. describes the marine dissolved oxygen criteria being developed by EPA. The draft criteria document was released for public comment on January 17, 2000. The TMDL language in this section should be updated to reflect this date. Similar changes in the date need to be made on pages 35 and 37.

We recommend expanding the discussion of the multiple effects of nitrogen on designated uses. Sample language is provided below. The purpose of this discussion is to highlight that nitrogen’s relationship to impaired designated uses is indirect and complex, with intermediate steps of algal blooms and decomposition, low DO, poor water clarity, inhibited plant growth, and ultimately marine organisms stress. While the TMDL for nitrogen is translated from DO standards, these other impairments have been considered and would benefit from the proposed program.

### Proposed insert to Section III. Applicable Water Quality Standards

In the Long Island Sound, nitrogen is the primary limiting nutrient for algal growth that leads to low DO levels, and the subsequent loss of the designated uses of the Sound. Nitrogen’s relationship to impaired designated uses is indirect and complex, with intermediate steps of algal blooms and decomposition, low DO, poor water clarity, inhibited plant growth, and ultimately marine organisms stress (LISS Phase III Actions 1998, p.1) The relationship of nitrogen loading to ambient nitrogen concentration and dissolved oxygen conditions is highly complex, non-linear, and typically requires calibrated and verified mathematical models to account for the controlling hydrologic, physical, chemical, and biological interactions.

EPA is developing guidance on deriving numeric nutrient water quality criteria for four basic types of waterbodies: lakes and reservoirs, rivers and streams, estuaries and coastal waters, and wetlands. EPA is also compiling an extensive national database of nutrient concentrations and associated response variables needed to derive criteria. EPA will use the national database to derive national recommended numeric nutrient water quality criteria for specific ecoregions, in accordance with the Agency’s waterbody guidance, for total nitrogen concentration, total phosphorus concentration, and associated response variables (e.g., chlorophyll a concentrations and turbidity). EPA has not yet published recommended criteria for nitrogen in estuarine environments, nor have States established criteria for nitrogen in estuarine environments. Ongoing workgroup activities related to EPA’s regional nutrient criteria development

indicate that such criteria may need to be estuary-specific or at least estuary type-specific. Long Island Sound has long been recognized as a unique estuary. All indicator measurements of potential candidates for criteria must be qualified by attention to tide cycles, density and salinity gradients, and currents (EPA Strategy for Nutrient Criteria 1998, p. 19).

It has been determined that reducing nitrogen loads necessary to achieve the water quality standards for DO will protect and maintain designated uses in the Sound. While the TMDL for nitrogen is translated from DO standards, other eutrophication-related impairments resulting from the intermediate steps of algal blooms and decomposition, poor water clarity, inhibited submerged aquatic plant growth, and stress to marine organisms have been considered and would benefit from the proposed program.

### **3. Loading Capacity - Linking Water Quality and Pollutant Sources**

*As described in EPA guidance, a TMDL identifies the loading capacity of a waterbody for a particular pollutant. EPA regulations define loading capacity as the greatest amount of loading that a water can receive without violating water quality standards (40 CFR § 130.2(f)). The loadings are required to be expressed as either mass-per-time, toxicity or other appropriate measure (40 CFR § 130.2(I)). The TMDL submittal must identify the waterbody's loading capacity for the applicable pollutant and describe the rationale for the method used to establish the cause-and-effect relationship between the numeric target and the identified pollutant sources. In most instances, this method will be a water quality model. Supporting documentation for the TMDL analysis must also be contained in the submittal, including the basis for assumptions, strengths and weaknesses in the analytical process, results from water quality modeling, etc. Such information is necessary for EPA's review of the load and wasteload allocations which are required by regulation.*

*In many circumstances, a critical condition must be described and related to physical conditions in the waterbody as part of the analysis of loading capacity (40 C.F.R. § 130.7(c)(1)). The critical condition can be thought of as the "worst case" scenario of environmental conditions in the waterbody in which the loading expressed in the TMDL for the pollutant of concern will continue to meet water quality standards. Critical conditions are the combination of environmental factors (e.g., flow, temperature, etc.) that results in attaining and maintaining the water quality criterion and has an acceptably low frequency of occurrence. Critical conditions are important because they describe the factors that combine to cause a violation of water quality standards and will help in identifying the actions that may have to be undertaken to meet water quality standards.*

The TMDL discusses why it is appropriate to express the LIS TMDL in terms of allowable annual loading. We agree that this is appropriate for nutrients contributing to eutrophication-related impairments. However, we suggest an expansion of the discussion on how water quality impacts resulting from nitrogen loading to the Sound are not generally sensitive to short term variations in loads, so that daily load allocations are not necessary to ensure that standards are met. Any information of the flushing time or the pollutant residence time of the Sound, as further support for expressing the TMDL as an annual load, also would be helpful.

### **4. Load Allocations (LAs)**

*EPA regulations require that a TMDL include LAs, which identify the portion of the loading capacity allocated to existing and future nonpoint sources and to natural background (40 CFR § 130.2(g)). Load allocations may range from reasonably accurate estimates to gross allotments. Where it is possible to separate natural background from nonpoint sources, load allocations should be described separately for background and for nonpoint sources.*

*If the TMDL concludes that there are no nonpoint sources and/or natural background, or the TMDL recommends a zero load allocation, the LA must be expressed as zero. If the TMDL recommends a zero LA after considering all pollutant sources, there must be a discussion of the reasoning behind this decision, since a zero LA implies an allocation only to point sources will result in attainment of the applicable water quality standard, and all nonpoint and background sources will be removed.*

See comments under sections 1 above and 5 below regarding the inclusion of CSOs and storm water point sources as load allocations.

## **5. Wasteload Allocations (WLAs)**

*EPA regulations require that a TMDL include WLAs, which identify the portion of the loading capacity allocated to existing and future point sources (40 C.F.R. § 130.2(h) ). If no point sources are present or if the TMDL recommends a zero WLA for point sources, the WLA must be expressed as zero. If the TMDL recommends a zero WLA after considering all pollutant sources, there must be a discussion of the reasoning behind this decision, since a zero WLA implies an allocation only to nonpoint sources and background will result in attainment of the applicable water quality standard, and all point sources will be removed.*

*In preparing the wasteload allocations, it is not necessary that each individual point source be assigned a portion of the allocation of pollutant loading capacity. When the source is a minor discharger of the pollutant of concern or if the source is contained within an aggregated general permit, an aggregated WLA can be assigned to the group of facilities. But it is necessary to allocate the loading capacity among individual point sources as necessary to meet the water quality standard.*

*The TMDL submittal should also discuss whether a point source is given a less stringent wasteload allocation based on an assumption that nonpoint source load reductions will occur. In such cases, the State/Tribe will need to demonstrate reasonable assurance that the nonpoint source reductions will occur within a reasonable time.*

### **Section VI.A.1**

(pp. 21-22) -- This section describes the allocation of the in-basin TMDL. Table 6 identifies the wasteload allocation for each of eleven management zones. The TMDL must identify the WLA for each facility 40 CFR 130.2 (h) and 130.2 (I)>. While text explains that the percent reduction to achieve the WLA for each zone is applied equally to each discharger (listed in appendix B of the TMDL), without a clear identification of each facility's baseline load, the individual WLA cannot be calculated. We recommend a table be added that identifies the WLA for each facility. At a minimum, the baseline loads from which the zone-specific percent reduction would be taken must be added, and the percent reduction for each zone should be listed (rather than requiring the reader to do the mathematical calculation for each zone.).

We support the intent to develop management zone plans and trading programs, as identified in the TMDL, that could modify the facility-specific WLAs. We would not require that a new TMDL be established to reflect the revised WLAs as long as the new allocations resulted in equal or greater water quality improvements, as defined by the use of the exchange ratios identified in the TMDL. We would require that EPA be notified annually of any changes in the WLAs through reallocations or trading. Conditions determining whether allocations could be revised without resubmitting a TMDL are outlined below.

- Within a management zone, reallocations among facility-specific WLAs can be modified without resubmitting a revised TMDL.
- Among management zones, reallocations among facility-specific WLAs can be modified without resubmitting a revised TMDL as long as the new allocations resulted in equal or greater water quality improvements, as defined by the use of the exchange ratios identified in the TMDL.
- Any reallocations of LAs among management zones, or reallocations between WLA and LAs within and among management zones, must be reflected in a revised TMDL to ensure that there is a reasonable

assurance that the modified LAs could be achieved. This position could be modified pending development of a trading program that lays out the framework and requirements necessary to provide reasonable assurance on achievement of LAs.

The TMDL should clearly state that in no case will a revised wasteload allocation be approved if it would cause localized adverse water quality impacts.

(p. 22) – The characterization of CSOs in Table 6 must be clarified. As footnote “c” acknowledges, CSOs are point sources, yet the current loads from these sources are reported in the nonpoint source category (as is also done in Tables 1 and 2). The footnote states that the reductions to the CSO loads will be “regulated as a WLA.” Presumably this means that the reductions required of the CSO discharges will be contained in NPDES permits. Nevertheless, the reductions for the CSOs are portrayed in Column 7 related to LA target loads (although to make this clear, there should be a footnote “c” corresponding to the load reductions just as there is for the current loads). Legally the CSOs are point sources and WLAs should be assigned to them, not LAs. Properly characterizing the CSOs as point sources with WLAs does not necessarily mean that the same percentage reductions must be required of the CSOs as are required of other point sources. The TMDL merely needs to explain the basis for concluding that only a 10% reduction in nitrogen is appropriate for these sources.

As noted in the comments under section 1 above, many storm water discharges are point sources rather than nonpoint sources. With EPA’s recent (December 8, 1999) promulgation of phase II storm water regulations, many previously unregulated storm water discharges will require NPDES permit coverage and will require the application of best management practices and other measures. Since, at present, there is insufficient information to determine the universe of point source vs. nonpoint source storm water discharges, it is reasonable for now to characterize these sources collectively as nonpoint sources. However, during the next few years the states should be conducting storm water surveys to identify the point and nonpoint storm water sources and, building on the phase II regulations, identify appropriate wasteload allocations.

(p. 23) – The discussion which follows Table 7 appears to be the only place where future growth is addressed. It is not clear what the TMDL intends regarding future growth, particularly for the period of time before Phase IV is implemented. This should be clarified with respect to both point and nonpoint sources.

## 6. Margin of Safety (MOS)

*The statute and regulations require that a TMDL include a margin of safety to account for any lack of knowledge concerning the relationship between load and wasteload allocations and water quality (CWA § 303(d)(1)(C), 40 C.F.R. § 130.7(c)(1)). EPA guidance explains that the MOS may be implicit, i.e., incorporated into the TMDL through conservative assumptions in the analysis, or explicit, i.e., expressed in the TMDL as loadings set aside for the MOS. If the MOS is implicit, the conservative assumptions in the analysis that account for the MOS must be described. If the MOS is explicit, the loading set aside for the MOS must be identified.*

### Section IV.D.

(p. 28) – Section VI. D describes the use of an implicit MOS, which is an acceptable approach, through the use of conservative assumptions in the analysis.

The last sentence of the second paragraph should be clarified to say “...the level of nitrogen reduction identified **in conjunction with mixing/aeration** is conservative, providing a margin of safety (MOS) for non “worst case”

years.”

The third paragraph in the margin of safety discussion is unclear. What are the “safety factors” referred to in the first sentence of that paragraph?

## **7. Seasonal Variation**

*The statute and regulations require that a TMDL be established with consideration of seasonal variations. The method chosen for including seasonal variations in the TMDL must be described (CWA § 303(d)(1)(C), 40 C.F.R. § 130.7(c)(1)).*

Section VI. E adequately describes the consideration of seasonal variations. Attainment of water quality standards is considered during the most critical seasonal period and from a model calibrated using hydrologic conditions that contributed to the worst water quality on record. However, the document should clearly state that the TMDL will protect water quality and attain water quality standards throughout the year because it was established to address the most critical conditions when minimum hourly DO levels occur (summer).

## **8. Monitoring Plan for TMDLs Developed Under the Phased Approach**

*EPA’s 1991 document, Guidance for Water Quality-Based Decisions: The TMDL Process (EPA 440/4-91-001), recommends a monitoring plan when a TMDL is developed under the phased approach. The guidance recommends that a TMDL developed under the phased approach also should provide assurances that nonpoint source controls will achieve expected load reductions. The phased approach is appropriate when a TMDL involves both point and nonpoint sources and the point source is given a less stringent wasteload allocation based on an assumption that nonpoint source load reductions will occur. EPA’s guidance provides that a TMDL developed under the phased approach should include a monitoring plan that describes the additional data to be collected to determine if the load reductions required by the TMDL lead to attainment of water quality standards.*

We have no comments at this time.

## **9. Implementation Plans**

*On August 8, 1997, Bob Perciasepe (EPA Assistant Administrator for the Office of Water) issued a memorandum, “New Policies for Establishing and Implementing Total Maximum Daily Loads (TMDLs),” that directs Regions to work in partnership with States/Tribes to achieve nonpoint source load allocations established for 303(d)-listed waters impaired solely or primarily by nonpoint sources. To this end, the memorandum asks that Regions assist States/Tribes in developing implementation plans that include reasonable assurances that the nonpoint source load allocations established in TMDLs for waters impaired solely or primarily by nonpoint sources will in fact be achieved. The memorandum also includes a discussion of renewed focus on the public participation process and recognition of other relevant watershed management processes used in the TMDL process. Although implementation plans are not approved by EPA, they help establish the basis for EPA’s approval of TMDLs.*

Section VII. C.

This section briefly outlines the implementation time line and steps. While implementation plans are not a required element in an approvable TMDL, we want to clarify one aspect of the implementation of the WLAs through permits.

The implementation schedule (Table 9) reflects the approach outlined in the LISS *Phase III Actions for Hypoxia Management*, which stated that “CTDEP and NYSDEC will propose modifications to NPDES permits for point source discharges by August 2000 incorporating nitrogen loading limits to achieve the point source component

of the five-year load reduction target, *and requiring that plans and implementation schedules be developed to achieve the point source component of the nitrogen reduction targets within 15 years (italics added).*”

Based on our recent discussions regarding implementation issues, we understand and expect that the permits for point source discharges to Long Island Sound will be modified or reissued to contain effluent limits based on the final WLAs, as well as compliance schedules. The schedules established in the permits must be at least as aggressive as the Phase III agreement: 40 percent of the target in five years, 75 percent of the target in ten years, and 100 percent of the target in 15 years. We plan to continue our discussions with both states to assist in developing or reviewing model permit language and to resolve remaining implementation questions.

## **10. Reasonable Assurances**

*EPA guidance calls for reasonable assurances when TMDLs are developed for waters impaired by both point and nonpoint sources. In a water impaired by both point and nonpoint sources, where a point source is given a less stringent wasteload allocation based on an assumption that nonpoint source load reductions will occur, reasonable assurance that the nonpoint source reductions will happen must be explained in order for the TMDL to be approvable. This information is necessary for EPA to determine that the load and wasteload allocations will achieve water quality standards.*

*In a water impaired solely by nonpoint sources, reasonable assurances that load reductions will be achieved are not required in order for a TMDL to be approvable. However, for such nonpoint source-only waters, States/Tribes are strongly encouraged to provide reasonable assurances regarding achievement of load allocations in the implementation plans described in section 9, above. As described in the August 8, 1997 Perciasepe memorandum, such reasonable assurances should be included in State/Tribe implementation plans and “may be non-regulatory, regulatory, or incentive-based, consistent with applicable laws and programs.”*

### **Section VI.C.**

In basing the WLAs on something short of the limit of technology, the TMDL is to a certain extent relying on achieving nonpoint source nitrogen reductions and increased dissolved oxygen levels through mixing/aeration. As early as 1991 alternatives to nitrogen reduction have been discussed as part of the LISS. We understand that mixing and aeration has been selected for inclusion in the TMDL because preliminary evaluations provide a quantitative demonstration that it has the potential to result in the attainment of DO standards. However, we do recommend that the background on assessing non-treatment alternatives be included in the section to provide perspective on the options other than mixing/aeration that have been suggested and evaluated.

The description of 40 CFR 125.3(f), which identifies the conditions under which non-treatment alternatives may be considered as a method of achieving water quality standards, is accurate. However, additional study is required before it can be determined whether mixing/aeration could fulfill these conditions, particularly demonstration that it is the preferred environmental and economic alternative.

As a result, additional documentation is necessary 1) to support that mixing/aeration could practicably be implemented from a technical standpoint and 2) to show reasonable assurance that it will be evaluated and would be employed (in the event they are still necessary after earlier phases are implemented). We recommend that the technical support information cited in reference No. 38 be included in the TMDL to demonstrate that mixing/aeration is technically feasible. Second, we recommend that the schedule and tasks for evaluating the uncertainties involved in mixing/aeration be added to this section (in addition to the reference in Tables 9 & 10). These uncertainties include the technical feasibility and cost of mixing/aeration, use conflicts, and adverse

environmental consequences. The results of these studies would be evaluated before determining whether the mixing/aeration option in Long Island Sound meets the conditions of 40 CFR 125.3(f). The document must also identify the process and schedule for implementing mixing/aeration if those uncertainties are satisfactorily addressed or for implementing alternative nontreatment actions (or additional pollutant reductions) to attain water quality standards if mixing/aeration is not implemented. We also recommend that other reasonable non-treatment alternatives be presented as part of the Phase IV evaluation.

Finally, we recognize that the degree to which mixing/aeration and/or other nontreatment alternatives would be a required, if at all, will depend on the degree to which DO levels respond to nitrogen reduction and on potential changes to DO standards based on the recently issued marine DO criteria. These factors have been identified in the TMDL for evaluation and will be reviewed in the revision, as appropriate, of the TMDL by August 2003.

## **11. Public Participation**

*EPA policy is that there must be full and meaningful public participation in the TMDL development process. Each State/Tribe must, therefore, provide for public participation consistent with its own continuing planning process and public participation requirements (40 C.F.R. § 130.7(c)(1)(ii) ). In guidance, EPA has explained that final TMDLs submitted to EPA for review and approval must describe the State/Tribe's public participation process, including a summary of significant comments and the State/Tribe's responses to those comments. When EPA establishes a TMDL, EPA regulations require EPA to publish a notice seeking public comment (40 C.F.R. § 130.7(d)(2) ).*

*Inadequate public participation could be a basis for disapproving a TMDL; however, where EPA determines that a State/Tribe has not provided adequate public participation, EPA may defer its approval action until adequate public participation has been provided for, either by the State/Tribe or by EPA.*

Section VIII. Public Participation should be updated to describe the State's public participation process for soliciting comment on the TMDL. Comments submitted on the TMDL and the State's responses to those comments must accompany the TMDL submittal.

## **12. Submittal Letter**

Each final TMDL submitted to EPA must be accompanied by a submittal letter that explicitly states that the submittal is a final TMDL submitted under § 303(d) of the Clean Water Act for EPA review and approval. This clearly establishes the State's intent to submit, and EPA's duty to review, the TMDL under the statute.