

DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF WATERSHED MANAGEMENT

ADOPTION OF THE AMENDMENT TO THE TRI-COUNTY WATER QUALITY
MANAGEMENT PLAN TO ESTABLISH A TOTAL MAXIMUM DAILY LOAD FOR
PHOSPHOROUS IN THE LOWER SYLVAN LAKE.

Public Notice

Take notice that on **APR 10 2002**, pursuant to the provisions of the New Jersey Water Quality Planning Act, N.J.S.A. 58:11A-1 et seq., and the Statewide Water Quality Management Planning Rules (N.J.A.C. 7:15-3.4), an amendment to the Tri-County Water Quality Management Plan was adopted by the Department of Environmental Protection (Department). This amendment establishes a total maximum daily load for phosphorus in the Lower Sylvan Lake and recommends pursuing de-listing for phosphorous, bacteria and sedimentation for Upper Sylvan Lake in Burlington Township, Burlington County. Available data indicate that phosphorus and bacteria levels are acceptable in the Upper Sylvan Lake. This will be confirmed through the de-listing process associated with the updating of the list of impaired water bodies that is prepared by the Department pursuant to Section 303(d) of the federal Clean Water Act 33 (U.S.C.121et seq.), commonly called the 303(d) list. This amendment implements the requirements of the United States Environmental Protection Agency's (USEPA) Water Quality Planning and Management Regulations (40 CFR 130) to establish total maximum daily loads for all water quality impaired waterbodies.

Total Maximum Daily Loads (TMDLs) represent the assimilative or carrying capacity of the receiving water taking into consideration point and nonpoint sources of pollution, as well as surface water withdrawals. A TMDL is developed as a mechanism for identifying all the contributors to surface water quality impacts and setting goals for load reductions for specific pollutants as necessary to meet surface water quality standards. Under Section 303(d) of the federal Clean Water Act 33 (U.S.C.121et seq.), TMDLs are required to be developed for waterbodies that do not meet water quality standards after the implementation of technology-based effluent limitations. TMDLs may also be established to help maintain or improve water quality in waters that are not impaired. A TMDL establishes waste load allocations and load allocations for point and nonpoint sources, respectively.

Where TMDLs are required to address documented surface water quality impairment, such changes are to be made to the varying sources contributing to the water quality problem in order to reduce the total pollutant load received by the waterbody. Load reduction goals established through TMDLs are achieved through the issuance of wasteload allocations (WLAs) for point source discharges, load allocations (LAs) for nonpoint source discharges, a margin of safety and as applicable, reserve capacity.

Since nonpoint source pollution, by definition, does not come from discrete, identifiable sources, load allocations consist of the identification of categories of nonpoint sources that contribute to the parameters of concern. Specific load reduction measures for those categories of sources, to be implemented through best management practices (BMPs) including local ordinances for stormwater management and nonpoint source pollution control, headwaters protection practices, or other mechanisms for addressing the priority issues of concern, are included in the analysis. There are no point source discharges to the Sylvan Lakes; therefore, only LAs are established in the Sylvan Lake TMDL.

In May 1999, the New Jersey Department of Environmental Protection and USEPA Region 2 entered into a Memorandum of Agreement (MOA) including an 8-year schedule to produce TMDLs for all water quality limited segments remaining on the 1998 Section 303(d) List of Water Quality Limited Waterbodies in New Jersey. The MOA was subsequently modified on June 22, 2000. When the Watershed Management Plan for Area 20 (WMA 20) is completed it will include the TMDL for Sylvan Lakes.

Notice of the proposed amendment was published in the New Jersey Register on March 20, 2000 at 32 N.J.R. 1083(b). A public hearing was held on April 18, 2000. The amendment (including the phosphorous TMDL, the plan for reduction of total phosphorus, and the response to comments) was submitted to USEPA pursuant to NJAC 7:15-7.2(k) for review in accordance with 40 CFR 130.7. On August 14, 2000, USEPA approved the phosphorous TMDL.

The Department is publishing this notice of adoption of an amendment to the Tri-County Water Quality Management Plan pursuant to N.J.A.C. 7:15-3.4. A complete TMDL report follows this notice and explains the development and substantive requirements of the phosphorous TMDL for the Sylvan Lakes and a phosphorus reduction plan.

While there are slight changes from the proposed amendment, the adopted amendment is not substantively different from the proposed version. The adopted amendment retains an implementation plan for reducing phosphorous loads to the Sylvan Lakes and information and data supporting the Department's intention to pursue delisting of the Upper Sylvan Lake from the Water Quality Limited Segments List for phosphorous, bacteria and sedimentation. In response to public comment, the amendment was modified on adoption to clarify two items in the implementation plan, one regarding the width of riparian buffers and the other regarding BMPs used during construction, and to correct the date of the proposed dredging of the Lower Sylvan Lake. In addition, based on USEPA's recommendation, the sediment load was not included in the TMDL calculation, but serves as an implicit margin of safety. This makes the TMDL calculation more conservative, because the implicit margin of safety, approximately 24%, is larger than the original explicit margin of safety of 5% (see "Reserve Capacity and Margin of Safety", page 10 of the TMDL document).

Comments on this amendment received during the public comment period, including the public hearing, are summarized below with the Department's responses. The administrative record for this amendment is available for public inspection by contacting the Department as follows:

Department of Environmental Protection
Office of Legal Affairs
401 E. State Street
PO Box 402
Trenton, New Jersey 08625-0402

Summary of Public comments and Agency Responses:

The following people submitted written and/or oral comments on the proposal:

1. Robert Schreiber, Burlington Township Engineer
2. Maya Van Rossum, Delaware Riverkeeper (combining April 28 and May 1, 2000 comments)
3. James M. Stuhltrager and Susan D. Mack, Eastern Environmental Law Center of Widener University
4. Christopher C. Obropta and Peter L. Kallin, Omni Environmental Corporation (Attachment 1 to Commenter 2's comments; incorporated by reference)

A summary of the comments to the proposal, and the Department's responses to those comments follow. The number(s) in brackets at the end of each comment corresponds to the commenter(s) listed above.

General and Procedural Comments

Comment 1: The commenter stated that since the Sylvan Lakes TMDL is one of the first TMDL's created by the State and the first lake TMDL in the State, it is setting a precedent for all other TMDLs to follow. (2)

Response to comment 1: Each TMDL for a waterbody on the Water Quality Limited Segments List will be developed based on the characteristics of the waterbody, the pollutant or condition of concern, and the land use around it. ~~The Sylvan Lakes are very small constructed lakes and are used by a small local population. The Sylvan Lakes are unlike most of the other listed waterbodies. The approach will be different for streams and rivers, natural lakes, constructed lakes with different characteristics, and waterbodies that have pollutant contributions from both point and non-point discharges. This type of TMDL is appropriate for Sylvan Lakes and will not in anyway limit the Department's analysis or potential remediation actions for other waters.~~

Comment 2: The commenter questioned if additional opportunity for public comment would be made available. (2)

Response to comment 2: As part of the proposal of the amendment of the Tri-County Water Quality Management Plan to incorporate the Sylvan Lakes TMDL, the Department provided a 30 day comment period for interested persons to submit written comments. In addition, the Department conducted a public hearing. All comments received in writing and at the hearing were considered in the development of this adoption notice. The comments did not result in any substantive changes to the proposed TMDL or implementation plan and did not raise any issues which required further public review. Therefore, an additional public comment period is not warranted before finalizing this TMDL.

Comment 3: The commenter stated that the watershed-based approach is not used in the Sylvan Lakes TMDL. (2)

Response to comment 3: The entire watershed of the two lakes was considered in this TMDL. The results of this TMDL will be incorporated in the larger watershed planning effort for Area 20, which includes the Sylvan Lakes. The watershed issues list developed by the watershed partners will determine what role the larger watershed effort will play in the implementation plan.

Comment 4: The dredging of the Lower Lake will be done in the summer of 2001, not the summer of 2000. (1)

Response to comment 4: The correction has been made to the TMDL document.

Comments on Delisting

Comment 5: There is not enough data to support the delisting decisions for the Upper Lake for fecal coliform and sedimentation. (2,3,4)

Response to comment 5: Fecal Coliform: As referenced in the TMDL document, the New Jersey Department of Health and Social Services (NJDHSS) bathing beach criteria is met at the bathing area based on data from the Local Department of Health. Non-attainment of this criterion was used to list the lake. The same criteria utilized in initially determining that a water segment of a waterbody should be listed should be used to determine whether a water segment or waterbody should be delisted. As non-attainment of NJDHSS criteria was the basis for listing Sylvan Lakes for fecal coliform, assessment for delisting utilizing NJDHSS criteria is appropriate. NJDHSS criteria are applicable to this bathing beach and are more stringent than Surface Water Quality Standards (SWQS) criterion for fecal coliform. Therefore, as demonstrated by the data in Table 3 of the TMDL document, the SWQS for fecal coliform has not been exceeded and it is appropriate to pursue delisting in the next iteration of the Water Quality Limited Segments List.

Sedimentation: Sedimentation was listed for its contribution to the phosphorus load, not because of lake depth or water clarity. There is no SWQS for sedimentation, therefore, since the phosphorus levels currently meet Surface Water Quality Standards the Department intends to pursue delisting for sedimentation in the next iteration of the Water Quality Limited Segments List. An amendment has been made to the TMDL document to clarify the basis for delisting of sedimentation. See also Response to comments 4, 8, 9, and 16.

Comment 6: Commentors questioned whether or not fecal coliform sampling correlated with rain events. (2,4)

Response to comment 6: In accordance with the required NJ Department of Health protocols weekly sampling was performed at the swimming area during the summer months, over several years. The Department believes this frequency is adequate to reflect a range of conditions including rainstorms, the effects of which are evident for several days.

Comment 7: Sources of bacterial contamination should be identified. (2, 4)

Response to comment 7: There is no reason to track down sources of bacteria because there is no current violation of standards for bacteria.

Comment 8: Delisting total phosphorus: Sampling needs to be done over at least a 12-month time frame, in order to determine whether delisting is appropriate. In addition, the sampling done to support delisting occurred in the months immediately following dredging of the Lake. Sampling during this period may have skewed the results. According to F. X. Browne, "nutrient translocation for the sediments through the plant tissue to the water column is a significant, if not a predominant, aspect of the nutrient budget for the two lakes." During the sampling in the months following dredging, the rooted vegetation that had been the source of this translocation of phosphorus may have been in the process of becoming re-established. Rapidly growing macrophytes trying to reestablish will take up available phosphorous and literally become phosphorus sinks. In addition, during the sampling period, herbicide application which had been taking place was suspended, again contributing to a situation where in-lake plants were likely in a period of rapid growth in an effort to reestablish themselves. Therefore, the sampling used to support delisting was likely not truly representative because it occurred during a time when macrophytes were utilizing significantly more phosphorus. Recognizing the important role the plants play in the Lakes' phosphorus loadings, additional sampling must be conducted to determine if the in-lake total phosphorus concentration is still below the criteria before delisting occurs. (2,4) Because the Department bases its de-listing proposal on extremely limited data, taken such a short time after dredging was completed and aeration begun, and dismisses a water quality exceedance with a wholly inadequate explanation, we strongly recommend this de-listing proposal be withdrawn and further testing be conducted. (3)

Response to comment 8: The exceedance noted occurred before all management measures were put in place. There is a clear downward trend in phosphorus levels. Samples were taken between April 1994 and January 1995. Sample results for Total Phosphorous (TP) were below surface water quality standards (0.02 and 0.03 mg/l) during the fall months when rapid growth of macrophytes would not be expected. In addition, the data do not reflect the removal of stormwater outfalls. Therefore, concentrations are probably lower than the existing data indicate. However, existing data support compliance with Surface Water Quality Standards, therefore the Department intends to pursue delisting in the next iteration of the Water Quality Limited Segments List. There is a public process associated with the development and adoption of the list pursuant to N.J.A.C. 7:15-6.

Comment 9: The Department asserts that the lower TP levels measured after September 1994 are due to the aeration process begun in August 1995. However, nothing in the 1986 report by F.X. Browne indicates that the aeration process is the likely cause of this measured decrease in TP. (3)

Response to comment 9: Aeration of a lake lowers phosphorus levels by allowing iron and other metals to bind phosphorous. Phosphorus precipitates out of the water column in a form that is not immediately bioavailable, lowering in-lake TP levels. Therefore, it is expected that

phosphorous levels would decrease after aeration. The F.X. Browne report addresses this on page 46 in the section entitled "Dilution and Aeration".

Comment 10: How was the sediment load of 16.8 kilograms per year determined? (2)

Response to comment 10: The sediment load was estimated from the information presented in the F.X. Browne report. It is the average of the ranges presented.

Comments on the TMDL calculation and Model

Comment 11: Data should be collected to confirm literature values used in the model and decision making. (2, 4)

Response to comment 11: The Department made direct use of the analyses in the Diagnostic/Feasibility Report performed by F.X. Browne and accepted by the Clean Lakes program. Federal TMDL guidance recommends the use of best available data when calculating TMDLs. Because no data exist to calculate loads into the Sylvan Lakes, the use of literature values is appropriate. The Department is unaware of any information that would suggest that use of literature values is not appropriate in this case.

Comment 12: The modeling done for the Lower Lake ignores contributions of phosphorus from atmospheric deposition. Atmospheric contributions can be on the order of 5% of the total load, which is the chosen margin of safety. Atmospheric deposition contributions for phosphorus should be discussed in the TMDL and an attempt should be made to quantify its contribution. (2,4)

Response to comment 12: The Department made direct use of the analyses in the Diagnostic/Feasibility Report performed by F.X. Browne and accepted by the Clean Lakes Program. Phosphorous from the air is deposited on the land and in the waterways. Phosphorous from atmospheric deposition is included in the runoff loads from forest and residential sources. The only contribution from atmospheric deposition that is not accounted for in the modeling for Sylvan Lakes is the direct contribution to the lake surface. Because the lakes are small, this contribution is insignificant.

Comment 13: The Walker model that was used to calculate the current in-lake total phosphorus concentration requires the input of detention time. The detention time would have changed after the removal of the stormwater outfalls. This should be accounted for. (2,4)

Response to comment 13: Detention time is a function of flow out of the lakes and volume of the lakes. Because the dam regulates the volume and outflow of these constructed lakes, removal of the stormwater outfalls does not affect either the volume or the flow out of the lakes. The amount of water entering the lakes through the stormwater outfalls was not large enough to have a measurable affect on the flow out of the lakes.

Comment 14: The proposed TMDL fails to set a "daily" load requirement as required by law. Annual average loadings do not fulfill the requirements of the law. (2)

Response to comment 14: 40 CFR §130.2(i) states: “ TMDLs can be expressed in terms of either mass per time, toxicity, or other appropriate measure.” The interpretation that total maximum daily load must be expressed as a daily load is a narrow interpretation of the term TMDL. EPA regulations specify that the TMDL can be expressed in other terms, for example, “mass per time.” Mass per time refers to an expression which includes a mass (for example, pounds, kilograms, etc.) and time (day, year, etc.). Therefore, kg/year, as was used for reservoir TMDLs, is consistent with the term TMDL as defined by EPA. Annual load is appropriate for these Lakes since the sources are episodic and storm driven in nature. Furthermore, phosphorus concentration in lakes is better represented by annual load than daily load.

Comment 15: A sediment TMDL must be established. (3)

Response to comment 15: There is no SWQS for sedimentation. Sedimentation was listed for its contribution to the phosphorus load, not because of lake depth or water clarity. Therefore, a separate TMDL is not required for sedimentation. An amendment has been made to the TMDL document to clarify the basis for delisting of sedimentation.

Comment 16: The commenter commends the State for including an explicit margin of safety in the proposed TMDL. The commenter would like to see some basis for selecting 5%. (2)

Response to Comment 16: The margin of safety is based on professional judgement. An explicit margin of safety of 5% was included originally to account for uncertainty in the methodology. In addition, the TMDL was calculated conservatively using a target concentration of 0.034 mg/l of total phosphorous. Therefore, the Department believed that a five-percent margin of safety was sufficient. However, based on discussions with the USEPA, the TMDL has been modified and no longer includes the contribution from sediment, thereby lowering the TMDL from 73.8 kg/yr to 65.8 kg/yr. The Department is no longer including an explicit margin of safety. The margin of safety, as described in EPA guidance, can be either explicit or implicit. The modified TMDL contains an implicit margin of safety by using critical conditions, conservatively estimating residential load, total phosphorus, and dredging of the lake. Therefore, the implicit margin of safety is equivalent to a margin of safety of about 24%.

Comment 17: The commenter commends the State for targeting a phosphorous concentration of .034 mg/l in order to ensure the water quality standard is never exceeded. (2)

Response to comment 17: The Department thanks the commenter for their support.

Comments on the Implementation Plan

Comment 18: The DEP has not taken adequate steps to fulfill the requirements identified in the Phosphorus TMDL for the Lower Lake, particularly regarding residential runoff. (2, 4)

Response to comment 18: The TMDL was calculated very conservatively, not taking into account the management actions that have already been implemented to address phosphorus loadings from residential areas. Since many significant management measures have been put into place to address the residential contribution, such as rerouting the stormwater outfalls away from the lakes and implementation of an extensive environmental education program, the Department has recommended that, after the dredging is completed, the phosphorus levels be evaluated to determine if further actions must be implemented. The actions that were

implemented were successful in lowering phosphorus in the Upper Lake; therefore, it is reasonable to assume that these actions will have a similar impact on the Lower Lake. If this assumption is incorrect, a list of actions that may be taken to further decrease phosphorous loadings has been included in the implementation plan. The Department will work with the Township to implement them.

Comment 19: The implementation plan for reducing the residential phosphorus load needs improvement. Specifically, the following actions should be added:

- 1) Recognizing that the standard detention basin does not provide water quality benefits and can actually exacerbate the problem, action item 1 should be rewritten to require retrofit of detention basins to accommodate infiltration and/or implement other water quality based BMPs such as wetland systems.
- 2) Public education efforts regarding pets and geese (emphasizing that the best way to approach the geese issue is through buffers that remove the desirable habitat mowed lawns create), no phosphorus fertilizer, and buffer strips is good. We recommend adding to this a component about stormwater runoff and steps homeowners can take to reduce runoff including using rain barrels, revegetating lawns, and redirecting rooftop runoff.
- 3) Riparian buffers are an excellent recommendation. We believe this provision should be modified to reflect the findings in current literature regarding buffers and nutrient pollution. A 75 to 100 foot buffer is what is currently recommended for addressing nutrient pollution. (2,4)

Response to comment 19: The Department believes that the current implementation plan is sufficient to achieve the phosphorous reductions that are necessary. Acknowledging the value of greater buffer width, the document will be modified to suggest a 75-foot buffer be used where practical.

Comment 20: "No phosphorus ordinances" are a terrific approach. (2)

Response to comment 20: The Department thanks the commenter for their support.

Comment 21: BMPs to reduce sediment loading are not included in the implementation plan. (3, 4)

Response to comment 21: The F.X. Brown report quoted a very low sedimentation rate. The Department calculated that it would take approximately 100 years for the Lower Lake to return to pre-dredging depths. In addition, most of the storm drains have been rerouted away from the Lake. Therefore, the Department believes it is not necessary to include BMPs that address sedimentation in the Lower Lake. In addition, BMP's which address nutrients generally address erosion and sedimentation as well.

Comment 22: The education program discussed focuses on children's education and construction of a nature trail. Neither of these will provide the water quality improvements needed today to achieve the TMDL. The commenter is disturbed that the State would even suggest including creation of a nature trail as somehow helping to improve water quality. The commenter believes that it is important for people to appreciate our natural resources but creating a general appreciation is not an acceptable means for attempting to meet water quality standards, and in fact many could argue that a nature trail is actually harmful from a water quality and waterway health perspective. This item must be removed from the TMDL document. (2)

Response to Comment 22: Actions that contribute in a general way not only to greater appreciation of the resources of the area, but also to increase public access to these resources must be encouraged. In addition, actions that increase the overall awareness of nonpoint source pollution must also be encouraged. In the long run, educational programs are beneficial. Input by the public on the planning of the nature trail to incorporate buffers as well as public access will be encouraged. The Department believes that the education element, including the nature trail, is an important component of the TMDL that must be retained.

Comment 23: The State needs to take a firm position against rerouting stormwater runoff as a way to achieve water quality standards. (2)

Response to comment 23: Rerouting stormwater runoff in the Sylvan Lakes has already been completed through the Clean Lakes Program. The Department has not taken a position on the merits of this method. In New Jersey most lakes are constructed impoundments and are not natural. The stormwater, under natural conditions, would be flowing into a stream and would have less of an impact than on an impoundment. Furthermore, many waterbodies, including lakes, have been the recipients of ill-conceived routing of stormwater. Since each waterbody involved in the TMDL process will receive individual analysis, including lakes, the Department reserves the right to accept whatever combination of management practices will work best to attain the water quality objectives for the water body in question.

Comment 24: Before dredging is implemented, what work has been done regarding the impacts to aquatic ecosystems of dredging the Lower Lake? It is critical that the habitats and aquatic uses of the Lake are considered and that the impacts of dredging on this ecosystem be considered before dredging is implemented. (4)

Response to Comment 24: The 1986 F.X. Browne report (Appendix B of the TMDL document) contains an environmental impact statement on the dredging. The conclusion was that there would be a short term disruption of the macroinvertebrate population and that care would need to be taken to prevent the increase of turbidity levels in outflow water downstream. Overall, dredging will have a positive effect on the aquatic ecosystem of the lake, because of the improvement that will be made in water quality.

Comment 25: If the watershed is at build out, how does implementing proper erosion and sediment controls affect the Lake? (2)

Response to comment 25: Build out occurred after completion of the study which resulted in listing of the lakes. Erosion and sediment controls after listing the lakes influenced current water quality and contributed to efforts to attain the total phosphorous criteria. The TMDL has been amended to clarify that, after build out, the requirements for erosion and sediment control will influence only redevelopment and rehabilitation of existing structures.

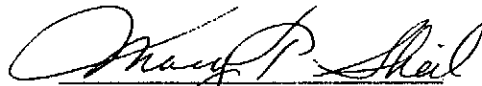
Other Comments

Comment 26: Data should be collected on the Lower Lake to ascertain whether it meets water quality standards for bacteria. (2, 4)

Response to comment 26: TMDLs are required only for parameters listed in the Water Quality Limited Segments. Although this question cannot appropriately be addressed through this TMDL process if it is identified as an area of concern in the larger watershed, it will be addressed in that forum.

Comment 27: The State should suspend use of herbicides in the Lakes. (2)

Response to Comment 27: The State of New Jersey does not apply herbicides in Sylvan Lake; the herbicide application is performed by Burlington Township. The Township has the appropriate permits to apply herbicides and must apply the herbicides in accordance with the label. The Department will encourage alternate means to achieve the desired result, but this is at the discretion of the Township.



Mary T. Sheil
Director
Division of Watershed Management
Department of Environmental Protection

4-10-02

Date