APPENDIX I. COMMENTS AND RESPONSES
On the First Draft (January 2003) TMDL

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Comments from the Mid-Atlantic Environmental Law Center

Comment: The Proposed TMDL Fails to Address the Impact of Municipal Point Sources.

The TMDL utterly fails to address the impact of municipal point sources of nutrients on water quality throughout the Neshaminy Creek watershed. Without any basis, PADEP has developed this TMDL on the faulty assumption that "potential problems related to [municipal] point source discharges are adequately being addressed" because facilities are "discharging nutrients at or below [their] permitted limits." TMDL at 17. The CWA imposes a legal obligation on PADEP to identify each water that does not meet or is not expected to meet applicable WQSs, even after the imposition of technology-based effluent limitations on all point sources. 33 U.S.C. § 1313(d)(1). That the municipal wastewater facilities are discharging nutrients at or below their permitted levels is irrelevant; waters that do not meet WQSs even after point sources meet their technology-based permit limits are precisely the waters that TMDL program is designed to restore.

The putative TMDL for phosphorous in Cooks Run most clearly demonstrates the absurdity of PADEP's decision to ignore point source contributions of nutrients. First, PADEP determines that phosphorous is the most critical nutrient in Cooks Run.[1] TMDL at 158. Next, PADEP determines that the maximum yearly total load of phosphorous in Cooks Run to attain WQSs is 701 lbs/year.[2] TMDL at 160-163. PADEP must then distribute this load between point sources though wasteload allocations ("WLAs"), nonpoint sources through load allocations ("LAs") and a margin of safety. 40 C.F.R. § 130.2(i). This load (701 lbs/year) is dwarfed by the single point source on Cooks Run. According to PADEP, the Boro of Doylestown-Harvey Sewage Treatment Plant is permitted to discharge up to 3,652 lbs/year of phosphorous. Yet, incredibly, instead of developing an appropriate WLA, PADEP declines to establish a WLA, and establishes a LA that has a "negative value."[3] By failing to establish a single WLA, PADEP has abdicated its responsibility to make the hard choices and develop and implement TMDLs that will control the problems of excessive nutrients.

Response: TMDLs for the Neshaminy Creek watershed have been revised to reflect loads from municipal point sources. The relevant sections where changes have been made include Sections B and D. In most cases where point source discharges exist, it has been recommended that current phosphorus discharge limits of 2.0 mg/l be reduced to 1.0 mg/l for current discharge flows, and that this limit be reduced to 0.8 mg/l when permitted flows are reached.

Comment: The Proposed TMDL Fails to Address Impacts of MS4s.

The proposed TMDL fails to address the impact of nutrient and sediment discharges from MS4s. PADEP correctly recognizes that discharges from MS4s constitute a substantial contribution of nutrients and sediments throughout the Neshaminy Creek watershed. E.g. TMDL at 107 (identifying "urban runoff/storm sewers as impairment source). Yet despite this acknowledgement, PADEP has failed to establish a single WLA, NPDES permit limitation, or

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stormwater management plan in accordance with EPA regulations and guidance. 40 C.F.R. § 122.30 et seq.; Establishing Total Maximum Daily Load (TMDL) Wasteload Allocations (WLAs) for Storm Water Sources and NPDES Permit Requirements Based on those WLAs (November 22, 2002). As with Municipal Point Sources, PADEP has abdicated its responsibility to make the hard choices and develop and implement appropriate TMDLs that control nutrients from MS4s.

Response: Revisions have been made in the TMDL document to reflect WLAs for "urban runoff" where appropriate. Specifically, sediment loads in most impaired sub-watersheds discussed in Section C have been revised to be WLAs rather than LAs.

Comment: The Proposed TMDLs are Based on Insufficient Data.

PADEP's data collection efforts for developing these proposed TMDLs are feeble. To estimate point source contributions of nutrients, PADEP merely multiplied low flow permitted nutrient concentrations by the flow. TMDL at 18. PADEP admits this flawed procedure ignores that the actual loadings "could be higher" because the permits only address summer flows and concentrations. Typically, most permits contain higher flow and concentration limits for winter months. Instead, what PADEP should have done was to review historic Discharge Monitoring Report data to determine actual point source contributions of nutrients.

Response: DMR report data were used to derive the permitted loads as reported in the document. It is well-known that point source-dominated stream systems such as Neshaminy Creek are most vulnerable during low-flow conditions, and that higher nutrient concentrations typically occur during the summer low-flow period. During this period, there is reduced stream capacity to assimilate point source discharges due to less streamflow available for dilution. Also, the activity of aquatic biota varies seasonally as a function of streamflow and temperature, with greater impacts associated with warmer, low-flow conditions. Since biological activity was an important consideration in DEP's original listing of the stream segments as impaired due to nutrients, attention to the summer low-flow period was critical. If the stream segments are protected during this critical period, then other periods of lower temperatures, less biological activity, and more assimilative stream capacity are protected as well. As described in Sections B and D, the modeling approach used in the TMDL assessment was revised to include the use of an "in-stream" model to evaluate low-flow conditions and impacts.

Comment: The Proposed TMDLs Assume Phosphorous is the Limiting Nutrient Without Adequate Support.

PADEP does not pay sufficient attention to whether phosphorous (P) or nitrogen (N) is the limiting nutrient in each stream segment in the Neshaminy Creek watershed. The TMDL determines that phosphorous is the limiting nutrient in the entire basin, although the only basis for this is an assumption that if the N/P ratio is greater than 10, phosphorous is the limiting nutrient. E.g. TMDL at 158. According to EPA, either N or P can be the limiting nutrient in streams and correct identification of the limiting nutrient is the first step necessary to control nutrient enrichment and algal growth. Draft EPA Nutrient Criteria Technical Guidance Manual (July 2000) ("Nutrient Guidance") at 74-76. The Nutrient Guidance states, "[I]f nonpoint sources of nutrients predominate … then N control may be a more important issue than control of P." Id. at 75. Throughout the proposed TMDLs, PADEP insists that nonpoint contributions are the

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primary source of impairment for all of the segments. Despite this, the proposed TMDLs contradict themselves by then assuming that phosphorous is the limiting nutrient. PADEP must clearly and correctly determine the limiting nutrient based on reliable data, not drive-by assumptions.

Response: Evidence has been provided to determine that phosphorus is the limiting nutrient in this watershed in Section D3 of the TMDL. The final TMDL attributes nutrient impairments to streams in the watershed to points source discharges during low-flow periods, and has been revised accordingly.

Comment: The Proposed TMDLs Fail to Establish A Daily Load.

PADEP bases the putative TMDLs on yearly average phosphorous loads and are therefore more accurately called "Total Average Yearly Loads," not "Total Maximum Daily Loads." The CWA requires Total Maximum Daily Loads be established for impaired waterways, not Average Yearly Loads. Because the proposed TMDLs do not provide maximum daily loads, they clearly fail to meet the requirements of section 303(d) of the CWA.

Response: The modeling approach used incorporates estimates of daily flows in making load estimations. The AVGWLF model is a continuous simulation model, which uses daily time steps for weather data and water balance calculations. Monthly calculations are made for sediment and nutrient loads, based on the daily water balance accumulated to monthly values. Therefore, all flow conditions are taken into account for loading calculations. Because there is generally a significant lag time between the introduction of sediment and nutrients to a waterbody and the resulting impact on beneficial uses, establishing these TMDLs using average annual conditions is protective of the waterbody. EPA has approved many TMDLs that include annual, not daily, loads.

Comment: The Proposed TMDLs Fail to Account for Seasonal Variations.

The proposed TMDLs do not account for seasonal variations in the amount of nutrients and the effect on the Neshaminy Creek watershed. Section 303(d) of the CWA requires PADEP to establish each TMDL "at a level necessary to implement applicable [WQSs] with seasonal variations." 33 U.S.C. § 1313(d)(1)(C). However, PADEP admits that the proposed TMDLs do not do this. PADEP did not collect any data about point source contributions of nutrients during winter "high-flow" periods. See supra at section 4. Further, PADEP has established annual load limitations in the LAs. See supra at section 5. Annual loads do not account for seasonal variations in either the amount or effect of nutrients.

Response: The continuous simulation model used for this analysis considers seasonal variation through a number of mechanisms. Daily time steps are used for weather data and water balance calculations. The model requires specification of the growing season, and hours of daylight for each month. The model also considers the months of the year when manure is applied to the land. The combination of these actions by the model accounts for seasonal variability. With respect to point source contributions, data from monthly discharge monitoring reports were used for load estimation. Additionally, the most vulnerable period for impacts in this watershed (low-flow, summertime conditions) was considered in evaluating potential impacts and needed reductions in nutrient discharges.

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Comment: The Proposed TMDLs do not Contain a Plan for Implementation.
PADEP has not produced an identifiable plan to implement the applicable WQSs through these proposed TMDLs. The proposed TMDLs do not require a single point source discharger to reduce its contribution of nutrients. The proposed TMDLs do not establish a single stormwater management plan to control the discharge from MS4s. Nor do the proposed TMDLs identify any Best Management Practices ("BMPs") that could reduce nonpoint sources of nutrients.

Response: The TMDLs for the Neshaminy Creek watershed have been revised to include wasteload allocations for municipal point sources. The relevant sections are Sections B and D of the final TMDL. Point source discharges with current phosphorus limits of 2.0 mg/l are to be reduced to 1.0 mg/l for current discharge flows, and to 0.8 mg/l when permitted flows are reached. Text related to the use of various BMPs to control nutrient and sediment loads from non-point sources are included in each relevant section. DEP encourages the implementation of such BMPs in the watershed through projects funded by the State's Growing Greener and other programs. The TMDL document, states that the implementation of "urban runoff-related" BMPs will occur in the watershed as a result of DEP's Comprehensive Stormwater Management Policy. This policy requires affected communities to implement BMPs to address stormwater control that will "reduce pollutant loadings to streams, recharge groundwater tables, enhance stream base flow during times of drought and reduce the threat of flooding and stream bank erosion resulting from storm events." The Phase II program for NPDES discharges addresses small construction sites, additional industrial activities, and for the 700 municipalities subject to the requirements for separate storm sewer systems (MS4). All of the municipalities located within the Little Neshaminy Creek watershed will be affected by this policy. Implementation of BMPs aimed at sediment reduction in urban areas will also assist in the reduction of phosphorus originating from transitional land uses and stream bank erosion. Finally, the TMDL has been revised to reflect the assignment of sediment loads due to urban runoff in impaired segments to WLAs.

Comments from the Delaware Riverkeeper Network

Comment: Nutrient Enrichment

Data collected for the Little Neshaminy assessment indicate that water quality in the watershed has, in many respects, improved over the last several decades. In spite of decreases in phosphorus concentrations, however, nutrient enrichment is still a major problem. This is manifested by excessive aquatic plant growth and resultant impacts on dissolved oxygen saturation and diurnal swings in dissolved oxygen concentrations.

Several aspects of this problem were investigated and several conclusions derived.

(a) Because of recent growth and development, the current point source derived nutrient load approaches the magnitude of the watershed load that was being experienced prior to the implementation of a phosphorus reduction program by PA DEP.

(b) Based on information contained in our report, we believe that it might be beneficial to adjust the timing of the Pa DEP phosphorus removal requirements. In 2001, we observed high percent D.O. saturation values and rapid plant growth occurring prior to April 1st. A review of oxygen data back to 1968 verified that aquatic plants are actively growing in

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March and often February. This suggests the possibility that adjusting the annual start date for seasonal phosphorus removal from April 1st to March or even February 1st might be warranted to suppress aquatic plant growth. It is likely also that the end point of the phosphorus reduction requirement could be reduced accordingly without any impact.

We observed that the flood of June 2001 scoured aquatic plant beds and bottom substrates significantly. After the flood, no evidence of aquatic plants was found in Little Neshaminy Creek. Aquatic plant growth and recovery was remarkably quick (less than two months) in the absence of significant stormwater runoff. This suggests to us that nonpoint sources of nutrient are not critical. Conversely, this observation may support the need to address the groundwater sources of nutrients referred to in PA DEP TMDL report.

Response: The TMDLs for the Neshaminy Creek watershed have been revised to reflect loads from municipal point sources. The relevant sections where changes have been made include Sections B and D. In most cases where point source discharges exist, it has been recommended that current phosphorus discharge limits of 2.0 mg/l be reduced to 1.0 mg/l for current discharge flows, and that this limit be reduced to 0.8 mg/l when permitted flows are reached.

Comment: Sediment

Our studies of stream channel stability and changes stream morphology indicate that the watershed is inherently unstable and has been for many decades. It is likely that the stream channels were unstable through much of the agricultural era. The Delaware Riverkeeper Network's Rivers Conservation Plan for the Middle and Upper Neshaminy (2002), for example, have some old postcard views showing similar streambank problems in other parts of the Neshaminy watershed. This instability is, of course, a major source of sediment to the system.

To say that channel erosion is primarily caused by elevated stormwater runoff caused by increased imperviousness over simplifies the nature of the problem. While we are in total agreement with the need to address "stormwater runoff and sediment production at new construction sites", we disagree that this action alone will result in the attainment of aquatic uses (DEP p. 43). Correction of the watershed's instability problems will require aggressive stream restoration, the nature of which will vary by location. In many cases, measures beyond riparian buffer enhancement are needed.

We also believe that restoration of the watershed and the correction of the sediment problem will require actions to address stormwater from existing development as well as new. High percent imperviousness is already a factor in much of the watershed (see report) and actions are needed to offset this permanent change in the character of the watershed.

Our report does note that some increase in stream stability may now be occurring in areas downstream of pre-1970 development. This is tenuous. Similarly, the report suggests that increased stream widening is possibly predictable above Bradford Reservoir due to recent development. Moreover, the impact of recent development may be expressed over time and, thus, not evident yet. We note in the report that scientific studies show that construction related sediment often decreases stream cross sectional area due to the excess sediment. Later on, stormwater runoff catches up, removes the deposited sediment, and the channel begins to widen

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beyond pre-development conditions. Whether the PSU model fully accounts for this is probably problematic.

Several dams in the Little Neshaminy Watershed are also a major source of channel instability and their contributions to stream sediment should not be ignored. Removal of several dams on Little Neshaminy and Park Creeks are recommended by our assessment and we are seeking funding to remove two of these dams. Instability caused by these dams is quite noticeable with stream widening due to the constant wetting of stream banks.

Lastly, another source of sediment that we believe contributes to sediment problems in Little Neshaminy Creek is the discharge from Bradford Reservoir after major storm events. Because this reservoir releases water beyond the duration of a natural high flow events, observations suggest that the lower half of Little Neshaminy Creek is likely being dosed with sediment fines that continue to flow from the reservoir long after other streams in the watershed have long cleared up. We did not investigate corrective actions, but changes in operation and maintenance procedures or sediment control in the watershed above the reservoir are possibilities. Removal of Bradford Reservoir is not being proposed.

Response: DEP concurs with the findings relative to sediment-related problems in the Neshaminy Creek watershed. DEP encourages the implementation of BMPs and other pollution mitigation efforts in the watershed through projects funded by the State's Growing Greener and other programs. The TMDL document, states that the implementation of "urban runoff-related" BMPs will occur in the watershed as a result of DEP's Comprehensive Stormwater Management Policy. This policy requires affected communities to implement BMPs to address stormwater control that will "reduce pollutant loadings to streams, recharge groundwater tables, enhance stream base flow during times of drought and reduce the threat of flooding and stream bank erosion resulting from storm events." The Phase II program for NPDES discharges addresses small construction sites, additional industrial activities, and for the 700 municipalities subject to the requirements for separate storm sewer systems (MS4). All of the municipalities located within the Little Neshaminy Creek watershed will be affected by this policy. Implementation of BMPs aimed at sediment reduction in urban areas will also assist in the reduction of phosphorus originating from transitional land uses and stream bank erosion.

Comments from Cornell Hopkins, Township Manager, New Britain Township

Comment: We have sent a letter to Senators Specter, Santorum and Representative Jim Greenwood regarding the US EPA determination that MS4's are point source pollution discharges. A copy of that letter has been mailed to Jenifer Fields, DEP Water Quality Permit Chief.

Response: The final TMDL includes MS4s as point sources.

Comment: By utilizing a biological rather than chemical field collection technique the study team has unduly biased their estimations such that any measure could be subject to as much as a 50% error.

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Response: The field assessment technique applied in the Neshaminy Creek watershed is the same as that applied elsewhere in the state as part of the Unassessed Waters initiative. This procedure has been approved for use by the U.S. EPA.

Comment: A margin of error is contained in all the sub watershed calculations. However only one-half of the statistically correct margin is shown. The Margin should be +/- 10%, not just -10%.

Response: The Margin Safety (MOS) used in preparing TMDLs should not be confused with the "margin of error" concept traditionally used in statistical analysis. It is somewhat similar, except that with MOS, uncertainty in modeling results is always addressed in the direction of protectng public health and safety. For example, if a water body containing 0.15 ppm total P generates excessive algal growth, the best science and professional judgment may predict that total P levels should be at 0.10 in order for algal growth not to threaten aquatic life. However, an additional "margin of safety" should be applied because of uncertainty of how the water body will respond. Accordingly, it is more prudent to set a target load of 0.08 than 0.10.

Comment: How many samples were collected per sub watershed? What is the statistical reliability of the number of samples?

Response: This specific information can be obtained from DEP's Southeast Regional Office. However, as indicated above the field assessment technique applied in the Neshaminy Creek watershed is the same as that applied elsewhere in the state as part of the Unassessed Waters initiative. This procedure has been approved for use by the U.S. EPA.

***Comment*:** Presenting this report with only a few days remaining before filing violates the spirit if not the letter of the law for public comments. We really did not have a basis to know what this session was going to cover. An executive summary mailed to us would have been helpful. It is not possible to make good comments in this context.

Response: The public comment period met the regulatory requirements for public participation of TMDLs. Whenever possible, DEP provides extended comment periods, but this was not possible in this instance.

Comment: We are working on Watershed Zoning for North Branch & Pine Run to their confluence at Forest Park Water. With the size of the document being difficult to download, would you please furnish a hard copy.

Response: A written copy of the final TMDL, after EPA approval, will be provided upon request

Comment*:* The TMDL target for diversion water from the Delaware River is unrealistic because a reduction could only be accomplished by treatment at the source. That would not be cost-effective under any scenario.

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Response: The TMDL has been revised to eliminate the reduction required of the diversion.

Comment: The linkage between TMDL & NPDES (Phase) II is a surprise to us. We need a lot more information to enable us to comply with NPDES II now and in 5 years at renewal.

Response: DEP will assist local government as much as possible to interpret and comply with the Phase II requirements.

Comment: Please consider using the names of the Tributaries, e.g., "Newtown Creek", Railroad Creek" (in NBT).

Response: Official stream names from the Pennsylvania Gazeteer Of Streams are used in the federally mandated Clean Water Act Section 305(b) Report If there is no official stream name, the term "tributary" must be used. The same names are used on the 303(d) List, and for continuity, must be also be used in the TMDL.

Comment: You missed lot of land development in Newtown & Lower Makefield Townships.

Response: On Pennsylvania's 2002 303(d) List, Core Creek and several of it's tributaries (Stream Segment ID# 980602-0954-GLW) were listed as being impaired by nutrients from agricultural land. Therefore, agricultural reductions were the focus of this TMDL. (Note: Inadvertent references to reductions from "urban sources" in the original document have been deleted from the relevant section (i.e., Section Q)).

Comments from USEPA

Comment: EPA is concerned that the proposed TMDL does not assign waste load allocations (WLAs) to the separate storm sewer systems (MS4s) within the Neshaminy Watershed. EPA regulations recognize these types of systems to be point sources and as such are required to be covered under the National Pollutant Discharge Elimination System (NPDES) program. Federal regulations require that NPDES-regulated storm water discharges be addressed by the WLA component of a TMDL (40 C.F.R. part 130.2(h)) and conversely requires that NPDES-regulated storm water discharges not be addressed by the load allocation (LA) component of a TMDL (40 C.F.R. 130.2 (g) & (h)).

A Memorandum issued by EPA on November 22, 2002, titled "Establishing TMDL WLAs for Storm Water Sources and NPDES Permit Requirements Based on Those WLAs", clarifies these existing EPA regulatory requirements. This EPA policy further clarified the consideration of MS4 areas in TMDL development by requiring that any area that is covered under the MS4 regulations must have a waste load allocation assigned to it when a TMDL is developed for the watershed. The Pennsylvania Department of Environmental Protection, in the proposed TMDL, has assigned load allocations to the MS4 areas in the Neshaminy Creek Watershed. EPA recognizes that the separate storm sewer policy was issued late in the TMDL development process for the Neshaminy Creek Watershed TMDL and that Pennsylvania Department of Environmental Protection may not have had sufficient time before making it available for public

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review and comment to revise the proposed TMDL to be consistent with the waste load allocation requirements. EPA strongly recommends that PA DEP fully consider the storm water requirements and make the necessary modifications before submitting the final TMDL to EPA for review and approval.

Response: The TMDL has been revised to reflect the assignment of sediment loads due to urban runoff in impaired segments to WLAs rather than LAs.

Comments from the Borough of Lansdale

Comment: The Borough has no record of ever receiving notice from the Department of the proposed TMDL, despite its obvious implications for the Borough's WWTP. The Borough believes that it should have received notification of the proposal directly from the Department.

Response: The Department made notice of the public meeting aand comment period on the draft TMDL through the Pennsylvania Bulletin and nowespapers. The commentor was also included in the public comment period on the revised TMDL.

Comment: The Borough has reviewed the proposed TMDL and the underlying facts cited in the proposal as they relate to the discharges from the Borough's WWTP. Based on our review of the proposal, we understand that the Department is not proposing any changes to the effluent limits contained in either the Borough's current NPDES permit, or its next permit, which is scheduled to be reviewed in 2005. The Borough agrees with the facts cited in the proposed TMDL with respect to the quality of the discharge from the Borough's WWTP and it supports the proposed TMDL as it relates to constituent discharges from the Borough's WWTP.

Response: Based on comments received from EPA and other interested parties, the sections dealing with point source discharges in the Neshaminy Creek watershed have been significantly revised. Specifically, TMDLs for the Neshaminy Creek watershed have been revised to reflect loads from municipal point sources. The relevant sections where changes have been made include Sections B and D. In most cases where point source discharges exist, it has been recommended that current phosphorus discharge limits of 2.0 mg/l be reduced to 1.0 mg/l for current discharge flows, and that this limit be reduced to 0.8 mg/l when existing flows are exceeded.

Comments from Dr. Fred Lubnow, Princeton Hydro, LLC

Comment: Based on my experience with watershed and NPS pollutant modeling, I feel that the use of the AVGWLF model, developed by the Pennsylvania State University, was an appropriate model for the Neshaminy Creek watershed. With regard to the model, I am specifically interested in the partitioning of the total suspended solid (TSS) loads into surface runoff and streambank erosion categories. Partitioning these sources of TSS on a basin-by-basin basis for the watershed will provide municipalities with the information required to make decisions on the selection and prioritization of the appropriate structural Best Management Practices. I strongly

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suggest that PA DEP make this component of the TMDL readily available in a "user friendly" format for distribution to the involved municipalities and other stakeholders.

Response: The partitioned TSS (i.e., sediment) loads from both upland and stream bank sources are provided separately in the document as both model results and load allocations where relevant.

Comment: One specific issue I would like to bring up is the use of the TMDL, and its endpoints, for standing waterbodies. At the 10 February 2003 public meeting, the Lake Galena phosphorus budget demonstrated that an 85% reduction in the existing phosphorus load is required, in order to achieve a mesotrophic (moderate productivity) state for the lake. The endpoint for this management recommendation was a chlorophyll a concentration of 10 ug/L. This recommendation assumes that the existing eutrophic (high productivity) state is undesirable.

As a limnologist, I have seen similar suggestions made in Phase I Diagnostic / Feasibility Studies for various lakes throughout the Mid-Atlantic States. I would caution relying entirely on shifting a lake ecosystem from eutrophy to mesotrophy for several reasons. First, it is possible that even in a completely "natural" state (i.e. no human activities within the Lake Galena basin) that the lake would still be eutrophic. For example, the State completed a TMDL on Lake Luxembourg, located within the southeastern portion of the Neshaminy Creek watershed in 1999. Using phosphorus as the TMDL endpoint, it was determined that even if the entire Lake Luxembourg watershed, which is the Core Creek basin, was completely forested, the lake would still be defined as an eutrophic ecosystem. This is primarily due to the fact that Lake Luxembourg is an artificial impoundment. In contrast to natural lakes, reservoirs are typically dammed streams or rivers and therefore have substantially larger watershed areas relative to a natural lake's watershed. Therefore, even in the absence of human activities (i.e. farming, development), a reservoir may still fall into the eutrophic category.

Second, the recommended management strategy implies that an eutrophic state is completely undesirable and that a waterbody is only considered "restored" if it is in a mesotrophic or oligotrophic (low productivity) state. This is not necessarily the case. Many highly prized freshwater recreational fisheries are eutrophic. Obviously, a highly eutrophic system is susceptible to algal blooms and other water quality problems; however, moderately or slightly eutrophic systems can be both highly productive and have minimal water quality problems.

Third, providing a scenario where the only targeted goal is a mesotrophic state will more than likely set up any proposed Implementation Program for failure. Again, this is based on past Phase I studies. Attempting to attain an 85% reduction in the existing phosphorus load, to reach the 10 ug/L of chlorophyll a, will be extremely costly and time consuming to implement. If is more than likely that even if implemented, observable results will not be realized for a number of years. Such conditions could result in a disinterest in the project, if no improvements are attained. To provide added insight into this I will again use Lake Luxembourg as an example.

Based on the Lake Luxembourg TMDL, the average TP concentration in the lake was 0.18 mg/L in the early 1990's. The baseline average TP concentration, assuming no human activities, would be 0.047 mg/L, above the US EPA's criteria for an eutrophic system. Based on US EPA's

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current nutrient criteria, TP concentrations greater than 0.03 mg/L result in eutrophic conditions. However, the targeted TMDL TP concentration for Lake Luxembourg has been set at 0.057 mg/L. Based on a review of Mid-Atlantic lakes, TP concentrations greater than 0.06 mg/L typically result in what the layperson perceives as unacceptable in terms of recreational water use (i.e. algal blooms). Thus, the established TP concentration for Lake Luxembourg is below the 0.06 mg/L. Based on the size of the Core Creek watershed, the baseline TP concentration would still result in an eutrophic ecosystem. Therefore, the targeted goal for Lake Luxembourg is not to shift it to mesotrophy, but instead to reduce the severity of eutrophy to minimize water quality problems. A similar approach is suggested for other waterbodies within the Neshaminy Creek watershed.

The State may want to provide a series of targeted endpoints for Lake Galena, instead of only one. For example, instead of having one established goal of a concentration of chlorophyll a of 10 ug/L, the State may want to develop a series of targeted goals. Such an approach would result in both observable and documented improvements in water quality. In case of Lake Galena, the first established goal may be to reduce the concentration of chlorophyll a to 20 – 25 ug/L. For many lakes, chlorophyll a concentrations greater than 30 ug/L are generally perceived as being unacceptable for recreational use. Thus, the goal would be to reduce the severity of eutrophy in Lake Galena and not to completely shift it to mesotrophy, in an "all or none" scenario.

Fourth, in the case of lakes, a variety of in-lake restoration techniques (i.e. aeration, alum applications, biomanipulation) can provide immediate, short-term relief from existing water quality problems, while the watershed-based techniques (i.e. structural BMPs, streambank stabilization) are being implemented for long-term nutrient reductions. Although the in-lake techniques typically address the symptom(s) of the problem and not the cause(s), such efforts can generate public support for the watershed-based techniques. This may be particularly important in the Lake Galena basin, where the majority of the watershed-based restoration efforts will focus on reducing agricultural NPS pollutant loads. Implementing in-lake restoration techniques, in concert with the watershed-based techniques, will aid in developing a strong, more widely accepted plan to improve existing water quality conditions.

In order to address this issue of concern on how to interpret the TMDL in the management of standing waterbodies, the following suggestions are being made:

1. Do not rely too heavily on the trophic state concept (i.e. eutrophic, mesotrophic) for making management suggestions. While trophic state does provide guidance in the interpretation of model results, management recommendations should not be solely based on this concept.
2. Eutrophic conditions should not be immediately considered undesirable, especially for those lakes highly prized for fishing.
3. A series of targeted endpoints, instead of one, should be considered for lakes. This will provide the public with a measured degree of success, instead of an "all or none" perspective.
4. The consideration of in-lake, as well as watershed-based, management techniques should presented to the basin stakeholders in attaining the targeted goals outlined in the TMDL. The in-lake techniques will provide immediate, short-term relief to water quality

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problems and assist in the development of a coalition to implement the watershed-based techniques.

Response: Thank you for the very insightful comments. DEP encourages the implementation of BMPs and other pollution mitigation efforts in the watershed through projects funded by the State's Growing Greener and other programs. There is flexibility in how non-point source problems are addressed in TMDL implementation. The Department is available to work with the local population to help determine plans for meeting the water quality standards for Lake Galena.

Comment: Finally, a large portion of the public comments during the meeting focused on how the results of the TMDL will tie into the upcoming stormwater MS4s. Given the level of public concern associated with the link between the TMDL and the stormwater MS4s, the State may want to reiterate that demonstrating progress in the implementation of a stormwater plan (i.e. design and installation of structural BMPs, public education, development of local ordinances for future development), will avoid specific "effluent" pollutant concentrations being ascribed to a municipality's stormwater.

Response: Thank you for the comment. With respect to problem mitigation, Pennsylvania makes funding available through the Growing Greener and Act 167 Programs to address water quantity- and water quality-related problems associated with runoff due to increasing land development in watersheds.

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