

APPENDIX H. COMMENTS AND RESPONSES (New)

Comment: The comment period provided by PADEP is insufficient to allow the Borough to provide meaningful comments on this 250+ page proposed TMDL

The draft TMDL was not publicly available for comment on PADEP's web site until October 20, 2003. Therefore, the requirement to provide comments by November 17 does not even provide a 30 day comment period, as required by law. (1, 2, 3, 4, 5, 6, 8, 9)

Response: The draft TMDL was noticed in the PA Bulletin and the Philadelphia Inquirer on October 18, 2003. At that time, the TMDL was available on the PA DEP website as indicated in those notices. The 30 day comment period required by regulation was provided.

Comment: There are a number of critical pieces of information used by PADEP in developing the TMDL that were only recently provided or have still not been made available to the Borough (e.g., the STREAMPLAN - PA computer modeling program and inputs). (1)

Response: The Department received no inquiries regarding the model until the public meeting on November 3, 2003. The model, and all associated files and documentation needed to replicate the Department's model runs, were provided to requestors on the following day. A model work session open to all stakeholders was also held after stakeholders received the model and had the opportunity to understand and run the model.

Comment: It is our understanding, based on information provided at a past meeting with PADEP, that PADEP has until April 2007 to promulgate a TMDL for this watershed. (1)

Response: The Department has until 2007 to either complete a TMDL for all water bodies on the 1996 Section 303(d) list or provide proper evidence that the waterbody is no longer impaired.

Comment: Given that the development of a TMDL for this watershed had been deemed to be a low priority by PADEP, the need to promulgate it by the end of the year has not been adequately explained. (1)

Response: The Department has been on a schedule to complete TMDLs for impaired waters on the 1996 303(d) list since 1997. The Neshaminy Creek watershed has been included in the number to be submitted to EPA in 2003.

Comment: The [Lansdale] Borough's WWTP discharges to Segment No. 492 of an Unnamed Tributary of the West Branch Neshaminy Creek. This unnamed tributary is included in Sub-Basin No. 1 of this watershed. A review of the history of the listing of this stream segment shows that there is no logical basis for its listing, particularly for impairments associated with nutrients. In addition, the Borough believes there is not an adequate basis for the current stream use designation (warm water fisheries). (1)

Response: The inclusion of the identified stream segment would have no bearing on the STP commenting as it is upstream of many nutrient impaired segments. Although there may be reason to believe that the small segment to which the plant discharges directly may be unaffected by nutrient reductions, it is the Department's belief that the plant is partially responsible for nutrient impairments along the entire stretch of the West Branch Neshaminy and along the mainstem. The detailed follow-up surveys outlined in Section D6.0 will assist in determining whether Segment No. 492 should stay on the 303(d) List, but its future inclusion on the 303(d) list is not relevant to the proposed TMDL.

Comment: The proposed TMDL assessment states that in point source-dominated stream systems, such as the Neshaminy Creek Watershed, low flow periods are considered to be the most critical in terms of potential water quality impacts and that phosphorous discharges from the municipal treatment facilities are impacting the stream during these time periods. However, review of available in stream total phosphorus data from Water Quality Monitoring Station No. 121 located on the Neshaminy Creek refutes this theory. During the period from October 1998 through May 2003, total phosphorous concentrations ranged from 0.10 mg/l to 0.67 mg/l. Further analysis of this data indicates that five of the seven highest values occurred during the winter or spring months and that the two highest values occurred during the winter months. These data indicate that low flow periods are not the critical periods and that in stream phosphorous concentrations are not being elevated by point sources. (1)

Response: Stream flow data at the WQN station 121 was reviewed for the period 10/1/85 through 9/30/02 to determine typical flow conditions within the Neshaminy Creek watershed. During this period, recorded flows ranged from 23 cubic feet per second (cfs) up to 17,000 cfs. Also during this time period, a flow of 100 cfs or less was measured 33% of the time. Conversely, for a majority of the time (about 67% of the time), a flow of 100 cfs was exceeded. Flows of 1000 cfs were only exceeded about 5% of the time (i.e., these flow events are generally rare). While it is true that low-flow conditions typically occur during warmer months (i.e., late spring through early fall), these low-flow events can, and do, occur throughout the year.

The commentator noted that high phosphorus concentrations have been measured at different times throughout the year. However, a review of stream monitoring data also shows that the higher phosphorus concentrations do occur during low-flow events regardless of the time of year. Table A, for example, shows in-stream phosphorus concentrations recorded at WQN station 121 during the period 1/19/95 through 8/15/02. Flow information was obtained from USGS at the same site for the same time period. Using 100 cfs as a cutoff point between "low-flow" and "high-flow" conditions, the average P concentration for low-flow conditions was calculated to be about 0.26 mg/l in contrast to a calculated value of about 0.16 mg/l for higher flow conditions (about a 1.6 times difference). Some of the high values did occur during winter months (i.e., 0.67 on 12/15/98, 0.36 on 2/8/00, and 0.51 on 2/26/02), but they also occurred during low-flow events when point source discharges predominate. Other large values such as 0.36 on 8/1/00, 0.2 on 1/31/01, and 0.36 on 3/13/01 were observed during extreme runoff/erosion events, but those occur only 4% of the time (i.e., 1280 cfs and greater).

Table A. WQN Station 121 In-Stream Phosphorous Measurements.

Date	Flow (cfs)	P (mg/l)	Date	Flow (cfs)	P (mg/l)
1/19/95	173	0.23	1/7/98	188	0.09
2/13/95	123	0.28	2/3/98	264	0.16
3/16/95	260	0.16	3/24/98	550	0.09
4/20/95	116	0.25	4/22/98	276	0.10
5/16/95	91	0.38	5/19/98	331	0.07
6/15/95	112	0.29	6/1/98	467	0.21
7/19/95	79	0.25	7/1/98	229	0.10
8/8/95	46	0.34	8/5/98	28	0.10
9/7/95	29	0.19	10/29/98	45	0.25
10/18/95	160	0.20	12/15/98	39	0.67
11/7/95	264	0.21	1/7/99	135	0.10
12/27/95	170	0.26	1/26/99	411	0.19
1/18/96	230	0.24	3/11/99	198	0.10
2/27/96	326	0.11	3/25/99	486	0.10
3/14/96	430	0.12	5/6/99	117	0.18
4/22/96	344	0.10	9/8/99	200	0.23
5/20/96	237	0.14	11/3/99	851	0.25
6/4/96	133	0.16	2/8/00	100	0.36
7/11/96	139	0.11	4/4/00	400	0.08
8/27/96	106	0.14	6/20/00	141	0.25
9/25/96	192	0.14	8/1/00	1800	0.36
10/17/96	168	0.09	10/10/00	109	0.20
11/6/96	149	0.06	12/26/00	92	0.14
1/22/97	381	0.12	1/31/01	1280	0.20
2/4/97	299	0.06	3/13/01	1470	0.36
3/19/97	305	0.06	5/15/01	81	0.28
5/1/97	234	0.06	7/17/01	78	0.19
6/4/97	440	0.14	9/24/01	59	0.19
7/10/97	83	0.14	11/14/01	35	0.11
8/6/97	134	0.12	2/26/02	51	0.51
9/16/97	69	0.15	4/30/02	250	0.18
10/1/97	50	0.08	6/18/02	132	0.18
11/24/97	151	0.15	8/14/02	50	0.25
12/16/97	73	0.30			

Comment: The proposed TMDL assessment does not include detailed calculations to determine if production of free flowing or fixed aquatic plant life will decrease as a function of phosphorus reduction at the municipal treatment facilities. According to the text by Thomann and Mueller, depending upon the length of the stream, the travel times involved, as well as upstream phosphorus levels after phosphorus reduction, there could be no reduction in free flowing or fixed aquatic plant life. This is because the stream is simply not long enough for a given net growth rate to result in a nutrient limitation. We believe that this is the case in the stream segment which receives discharges from the Borough's WWTP and may be the case in the entire Neshaminy Creek Watershed. In fact, the text by Thomann and Mueller indicates that for effluent dominated streams, if the upstream phosphorus level is greater than 0.025 mg/l, phosphorus concentrations in a point source discharge will have no impact on the growth of free flowing aquatic plant life because the upstream phosphorus concentration alone is already above the maximum limiting concentration. According to PADEP's May 1994 stream survey, the in stream phosphorus concentration upstream of the Borough's WWTP outfall was 0.070 mg/l. (1)

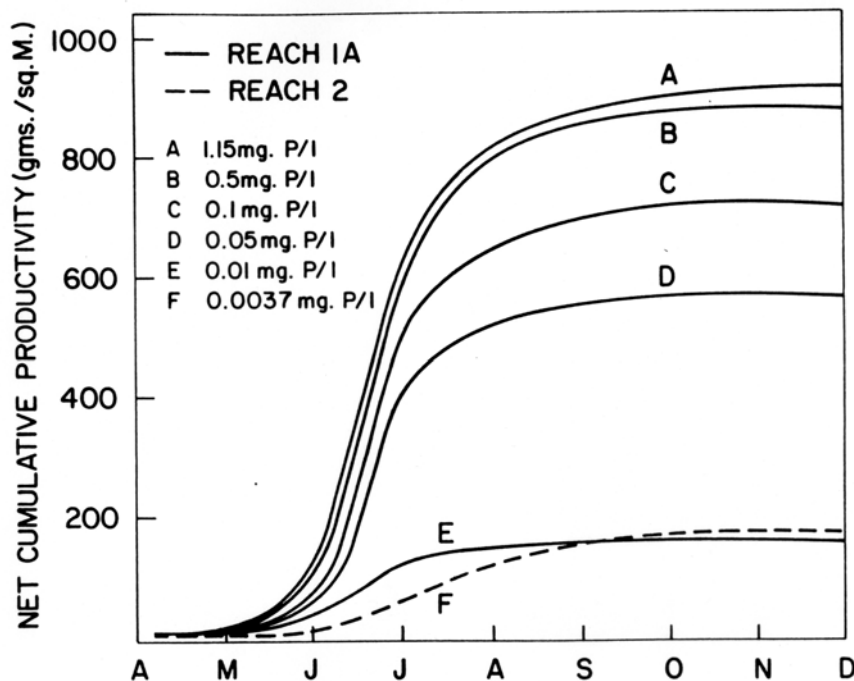
Response: The point source reductions established in the TMDL are designed to protect the entire Neshaminy Creek watershed, not just the stream segment to which an individual facility discharges. The issue raised by Thomann and Mueller is not as much about stream length as it is about travel time. The Neshaminy Creek – Use Impairment Study that precipitated the original 303(d) listing of Neshaminy Creek included 10 monitoring stations stretching from the headwaters to the watershed outlet. These stations measured flow velocities that ranged from 0.04 feet per second in the headwater stations to a maximum of 0.2 feet per second at the watershed outlet draining all 220 square miles. The water flowing from the segment that you reference, traveling at the maximum velocity measured in the watershed (0.2 fps), would take more than 12 days to reach the outlet. However, measured streamflows did not exceed 0.11 fps anywhere above the confluence of the Little Neshaminy and Neshaminy Creek; therefore, the travel time for the Lansdale discharge to the watershed outlet is more on the order of 20 days under critical conditions. If the time of travel through the short segment mentioned requires phosphorus limits set at a fraction of the half-saturation constant, then further work will be done in the future to establish that need and the appropriate actions will be taken.

Additionally, the documented impairments in Neshaminy Creek and its tributaries are due to fixed algae (periphyton), not floating algae (phytoplankton) making only Section 7.9 of Thomann and Mueller applicable. In Section 7.9, Thomann and Mueller state that, "At concentrations of the nutrient greater than about five times the half-saturation concentration, the effect of the nutrient on the growth rate is less than 20%" (p. 439). This statement confirms our belief that a decrease in in-stream nutrient concentrations will not correspond to an equivalent decrease in algal biomass, but will decrease the biomass by some extent. This argument is strengthened by the results of a study conducted by Wright and McDonnell (1982) and cited in Thomann and Mueller throughout chapter 7, section 9. Figure 28 from Wright and McDonnell is included for your reference. The figure illustrates that a decrease in in-stream phosphorus concentration from .5 mg/L to .1 mg/L will result in a decrease in net cumulative

productivity of approximately 19%. This result is consistent with the discussion in Thomann and Mueller. Additional support for this argument can be found in the results of studies conducted by Biggs (2000), Chetelat et al. (1999), Dodds et al. (1997), Lohman et al. (1992), Bothwell (1989), and many other articles. All studies listed here employed multiple linear statistical regression techniques to investigation of the relationship between phosphorus concentration and chlorophyll a levels. While the equations developed in each of the studies are different they all express a positive relationship between in-stream phosphorus concentrations and levels of chlorophyll a. It is also important to note that these statistical relationships were developed over a range of in-stream phosphorus concentrations that extends both above and below five times the half saturation constant (0.025 mg/L) for phosphorus. The range in phosphorus levels used in these studies to develop the regression relationships indicates that decreases in phosphorus concentration will lead to decreases in biomass at concentrations above 0.025 mg/L.

Lastly, as is stated in the TMDL and has been expressed in previous contact, the solution to the problem of nuisance algae in the Neshaminy Creek watershed will be an iterative process. Therefore, if upon reassessment of the condition of Neshaminy Creek nuisance algae persist, in-stream nutrient concentrations will be reassessed.

Figure 28 from Wright and McDonnell (1982). Variation of cumulative ecosystem productivity as a function of in-stream phosphorus



Comment: As stated above, the proposed TMDL assessment includes data for in stream DO concentrations for the main stem Neshaminy Creek. However, the assessment does not include any data or discussion related to diurnal DO ranges. This is a very important parameter in attempting to determine: (1) in stream phosphorus uptake rates by fixed aquatic plant life and (2) if production of fixed aquatic plant life will decrease as a function of phosphorus reduction at the municipal treatment facilities. Such assessment and data are critical in order to assess the likelihood of the effects of the reductions in phosphorus proposed for both the main stem and the sub-basins. This is a significant omission from the proposed TMDL and without it, the proposed reductions are without support. The Borough requests that PADEP collect and include diurnal DO data for all sub-basins in another draft TMDL proposal for comment prior to promulgation of the final version of the TMDL.

Response: None of the stream segments in the Neshaminy Creek watershed are on the Section 303(d) list of impaired waters for dissolved oxygen violations. While the Department agrees that further studies, including diurnal DO monitoring, should be done in the future to assess the extent of the effects of the nuisance algae on DO ranges, the lack of such data does not indicate a lack of support for the TMDL. The TMDL was established to lower in-stream phosphorus concentrations and decrease attached algal growth. Once the reductions are made, studies will be performed to ensure that applicable DO criteria are met.

Comment: The proposed TMDL assessment is based on total phosphorus, however, total phosphorus is composed of total dissolved phosphorus and total particulate phosphorus. Furthermore, only a portion of the total dissolved phosphorus (orthophosphorus) is available for aquatic plant growth. According to the text by Thomann and Mueller, typically, only about 75% of the total inorganic nutrient is available for use by aquatic plant life. Review of available in stream orthophosphorus and total phosphorus data from Water Quality Monitoring Station No. 121 located on the Neshaminy Creek (although it is not specifically stated in the proposed TMDL assessment, it is our understanding that this is the monitoring station which PADEP utilized to obtain in stream data) indicates that the ratio of orthophosphorus to total phosphorus is 73% which supports the supposition by Thomann and Mueller. The lack of consideration of orthophosphorus is a significant omission in the TMDL and without it, the TMDL lacks support and is arbitrary and capricious. The Borough requests that PADEP utilize orthophosphorus in another draft version of the TMDL assessment for public comment prior to finalization of the TMDL, as it has done in previous TMDL assessments (i.e. Wissahickon Watershed TMDL Assessment). As an alternative, PADEP should provide an additional draft TMDL for comment which provides the municipal treatment facilities with credit for the difference between total phosphorus and orthophosphorus. (1)

Response: Thomann and Mueller's assumption of 75% of total phosphorus being orthophosphorus is well established, but irrelevant for the TMDL. The goals are based on total phosphorus data obtained from DMRs and calculated by the model. If we

assume that only 75% of that discharged phosphorus is orthophosphorus, we must also reduce the target concentration by 25%.

Comment: It is our understanding that AVGWLF and STREAMPLAN - PA computer models utilized to prepare the proposed TMDL assessment utilized default or text book data for parameters associated with stream conditions and characteristics. We strongly disagree with this approach. Current, site specific stream data should have been collected and utilized to prepare these models. It is also our understanding that the STREAMPLAN - PA computer model was calibrated using data from one water quality monitoring station. We also strongly disagree with this approach. This particular model should have been calibrated using current site specific stream data from each sub-basin since the assimilative capacity of each stream segment could differ significantly. If requested, the Borough would have been amenable to assisting PADEP in collecting site specific data for its sub-basin for use in preparing the proposed TMDL assessment. We are confident that other affected municipalities would have also participated in this type of effort. PADEP's failure to use site specific data for stream parameters and calibration of the model is a significant omission and the TMDL is seriously deficient as a result. The Borough therefore requests that PADEP utilize current, site specific stream data in the computer models in another draft TMDL provided for public comment prior to issuance of the final version of the TMDL. (1)

Response: The AVGWLF model used to quantify sub-basin loads within the Neshaminy Creek watershed did not, as stated in the comment, use "default or text book data" for evaluating loads in the sub-areas. In fact, as described in Section B1 of the TMDL document, actual data on such factors as land use/cover, soils, topography, climate, etc. were used to drive the model. Additionally, groundwater monitoring data available in the area were used to determine that groundwater nitrogen and phosphorus estimates used in the modeling process were, in fact, very reasonable (see later comment and response). Finally, and most importantly, model calibration (as described in Section B1.4) was performed to ensure that simulated loads matched observed loads determined from actual in-stream water quality data available at a downstream water quality monitoring station (WQN 121).

With respect to the STREAMPLAN-PA model, very few default values were employed. With the exception of the stream side slope angle and Manning's "N" parameters, numerical values for model parameters were calculated using a variety of techniques.

Streambed width is used within the model to calculate water depth. Values for this parameter were estimated using techniques discussed in Applied River Morphology (Rosgen, 1996) and originally developed by Dunne and Leopold (1978). Stream cross-sectional area and stream width were derived using regional curves developed for the eastern United States. Using a side-slope angle of 26.1 degrees, stream cross-sectional area, and stream width, streambed width was calculated using the associated trapezoidal geometric relationships.

Manning's N values have been used routinely by hydrologists and engineers to predict mean velocity since the concept was presented originally in 1889 (Chow, 1964). Stream velocity (and by extension, travel time) is calculated using the following equation:

$$\bar{U} = \frac{1.49(R)^{2/3}(S)^{1/2}}{n}$$

Where:

\bar{U} = mean velocity

R = hydraulic radius (cross-sectional area/wetted perimeter)

S = slope of stream

n = Manning's roughness coefficient

Personal communication with several members of the faculty in The Pennsylvania State University's Civil Engineering department indicated that Manning's "n" is typically set at n = 0.035 in the absence of site specific data.

Stream slope and stream temperature were estimated from geographic information systems and site-specific data respectively. Estimates of stream slope were derived from 10-meter resolution digital elevation models. Elevation at the upstream and downstream nodes of each stream segment were extracted from the DEM then divided by the length of stream between the upstream and downstream nodes to estimate stream slope. All available temperature data for the Neshaminy Creek watershed was downloaded from the U.S. EPA Legacy STORET web site (<http://www.epa.gov/storpubl/legacy/gateway.htm>).

Finally, it is extremely important to note that the model was calibrated to flow and phosphorus data collected between January 1994 and December 1998. The accuracy of model predictions was assessed using the Nash-Sutcliff statistic, which represents the degree of fit between measured and modeled phosphorus loads. The Nash-Sutcliff statistic is calculated as

$$NS = 1 - \frac{\sum (obs_i - pred_i)^2}{\sum (obs_i - \overline{obs})^2}$$

Where:

NS = Nash-Sutcliff coefficient

$obs_i = i^{th}$ observed (measured) value

$pred_i = i^{th}$ predicted (modeled) value

\overline{obs} = average of all observed values

Coefficients range between 0 and 1, with 0 indicating that the mean value of the measured data is a better prediction of the true condition than the model and 1 indicating

a perfect fit. Coefficient values greater than 0.5 are generally thought to represent good model performance. In this case Nash-Sutcliffe coefficients of 0.794 and 0.653 were calculated for phosphorus load and flow respectively, indicating an excellent fit between the model results and the in-stream condition. Since both the hydraulics and the phosphorus loads are simulated with a high degree of accuracy, we can conclude that the estimated concentration values are also indicative of the in-stream condition. Therefore, while there are more complex methodologies available and additional stream measurements could have been made, we can conclude that the parameter values used in the modeling reflect the true condition based upon the accuracy of the simulated hydraulics and pollutant loads.

Comment: PADEP explained at the public meeting that the model discussed above does not consider algal growth. Given PADEP's statements that the basis for the concern over phosphorus loadings in the stream is the effect on algal and plant growth, PADEP's use of a computer model that does not consider the major impact of concern is a significant problem. As such, the use of this computer model, as well as the results of this modeling, are arbitrary and capricious. (1)

Response: The impairment in the Neshaminy Creek watershed is due to nuisance algal growth; however, the impairment is caused by excess phosphorus and the target TMDL is directed as such. Even a model that attempts to compute algal cell growth can not answer the question of "how much is too much?". That question can only be answered by actual stream assessments. Follow-up stream assessments will be made in order to determine if the proposed phosphorus reductions were enough to bring about the desired outcome.

Comment: The proposed TMDL assessment indicates that an 11% reduction in phosphorus loadings is anticipated as a result of the best management practices which will be implemented in the watershed under PADEP's Phase II NPDES Stormwater Permitting Program. It also indicates that a reduction in permitted phosphorus loads at municipal treatment facilities will result in a 17% reduction in in-stream phosphorus levels at the mouth of the watershed, which PADEP calculated is an acceptable level of decrease. However, it appears that PADEP failed to consider the effect of the 11% reduction to be gained by the Phase II program in setting the TMDL for point source discharges. This omission is a significant flaw. The Borough requests that PADEP delay implementation of a reduction in permitted phosphorus loads at municipal treatment facilities until the impacts of PADEP's Phase II NPDES Stormwater Permitting Program on stream quality can be evaluated and an in stream goal for phosphorus is calculated. (1)

Response: The phosphorus loads mentioned are delivered during wet weather events, while the critical period for nuisance algal growth is during low flow conditions in the growing season. The phosphorus loads delivered during the storm events are not present at Q₇₋₁₀, so the reduction of such loads need not be accounted for in the low flow analysis. However, even though the nonpoint source loads are negligible during this period, the loads (background during this critical period) were reduced before being input to STREAMPLAN-PA.

Comment: PADEP should also consider the benefits of implementing other BMPs, in areas of the watershed which actually have excessive aquatic plant growth, to control parameters (other than in stream nutrient levels) which contribute to this condition and reduce the burden upon the municipal point source dischargers. For example, a BMP could be implemented to require the canopy to be enhanced in areas of the watershed which actually have excessive aquatic plant growth to reduce the amount of available sunlight and in turn reduce aquatic plant growth rates. The Borough requests that PADEP provide an evaluation of these BMPs in a new draft TMDL for public comment prior to finalization. (1)

Response: TMDLs are required to look at sources of loads to impaired waters. The source of the impairment in the Neshaminy Creek watershed is nutrients from point source dischargers and reductions were prescribed accordingly. However, as mentioned in the TMDL, this is a staged TMDL and the Department will reassess these waters following implementation to evaluate the effectiveness of the reductions and whether further reductions are required. Because inducing a light limitation on these waters may lessen the need for future reductions, the Department encourages efforts to increase the shading on these water bodies.

Comment: The proposed TMDL assessment does not include any discussion of habitat changes in the watershed. This is a significant omission. A new draft TMDL should be prepared which includes an analysis of habitat changes in the watershed which are impacting water quality and are not reversible.

In addition to the above, the Borough believes that the current stream designation as a warm water fishery is not supportable due to irreversible habitat changes in the watershed. (1)

Response: TMDLs, by definition, set allowable pollutant loads for water bodies. They do not attempt to quantify habitat changes, nor do they allocate a load based on habitat changes. However, the Department disagrees with the conclusion that the habitat changes are irreversible. Habitat restoration efforts may bring about improvements that will alleviate the need for further reductions in the future.

Warm water fishes is the least protective aquatic life use in the Department's water quality standards. The Department also disagrees with the conclusion that the Neshaminy Creek watershed cannot support a warm water fishery.

Comment: PADEP's change in approach regarding this TMDL is unsupported. As you know, in December 2002, PADEP published the original version of the proposed TMDL assessment which stated for a number of reasons that:

“ it is not PADEP's intent to ask municipal treatment facilities to make any further reductions to existing permitted loads. Rather, it is recommended that municipal waste load allocations be equivalent to their respective permit limits.”

However, for some reason, the current version of the proposed TMDL assessment now recommends that permitted phosphorus loads from municipal treatment facilities be cut by 50% or more. This very significant change in approach was not supported in the record. At the recent public meeting, PADEP simply explained that the change was based on comments received from EPA, none of which have been provided in the record. Because this change has not been adequately supported in the record, PADEP has prevented the Borough from providing meaningful comments on this issue in violation of the Borough's due process rights. Further, this unsupported change in position is arbitrary and capricious. The Borough requests that PADEP provide the basis for the change in a new draft of the TMDL for public comment prior to finalization of the TMDL assessment. (1)

Response: The proposed TMDL reflects the most current understanding of the impairments in the Neshaminy Creek watershed. The change is adequately supported by the field surveys in 1998, close to a decade after the last reductions were required of dischargers. It is the Department's belief that the streams in the watershed have recovered to the full extent that past reductions will allow, but are still overproductive and choked with algae in many areas where the only nutrient source of any significance is the municipal treatment facilities. The Department has provided the 30 day public comment period required by regulation on the revised TMDL and does not believe any due process rights were violated.

Comment: The proposed TMDL assessment does not include either an analysis of the economic impacts associated with its proposed requirements or a cost benefit analysis of different alternatives than the specific TMDL proposal. Reductions in permitted phosphorus loads at municipal treatment facilities will require: (1) significant capital expenditures, (2) increased operational costs for additional manpower, electricity, chemicals and disposal of additional waste sludges and (3) increased maintenance costs. PADEP's failure to consider economic costs or alternative approaches is an abuse of discretion and arbitrary and capricious. Moreover, it provides no justification to those taxpayers, who will be funding the WWTP upgrades, for the expenditure of such funds during difficult economic times. (1)

Response: Cost-benefit analyses are not required elements of TMDLs and are beyond the scope of this document. The Department suggests various pre-treatment water conservation alternatives that offer additional environmental benefits and may reduce the cost of compliance with the TMDL requirements.

Comment: Third, PADEP has not provided sufficient data or information in the proposed TMDL assessment to warrant a reduction in permitted phosphorus loads at municipal treatment facilities. Typically, water bodies exhibit increases in the severity and frequency of phytoplankton blooms and growth of aquatic weeds when in stream nutrient (nitrogen and phosphorus) levels are elevated. According to the text by Thomann and Mueller (which is cited a number of times by PADEP in the proposed

TMDL assessment), the increased production of free flowing and fixed aquatic plant life can cause:

- 1) Aesthetic and recreation interferences - algal mats, decaying algal clumps, odors and discoloration may occur.
- 2) Large diurnal variations in dissolved oxygen (DO) can result in low levels of DO at night which can contribute to the death of desirable fish species.
- 3) Phytoplankton and weeds that settle to the bottom of the water system and create a sediment oxygen demand which can lower DO values.
- 4) Large diatoms (phytoplankton that require silica) and filamentous algae that can create problems in the filters of water treatment plants.
- 5) Extensive growth of rooted aquatic macrophytes (larger plant forms), which interfere with navigation, aeration and channel carrying capacity.

The proposed TMDL assessment does not provide any evidence of the water quality impacts listed above, which are typically associated with elevated in stream phosphorus levels. We are not aware of any problems due to elevated phosphorus levels either in the stream segment into which the Borough discharges or at the Philadelphia Suburban Water Treatment Plant, which withdraws raw water from the main stem Neshimany Creek. (1)

Response: The TMDL includes the sections of the 303(d) list applicable to the Neshaminy Creek watershed. Documentation supporting those listed waters include many instances of excessive algal growth, elevated phosphorus levels, and impaired macroinvertebrate communities. Such documentation is not included in TMDL documents, but is available from the Department upon request.

Comment: The proposed TMDL assessment actually concludes that it is very difficult to ascertain if nutrient loadings are in fact a problem in the Neshaminy Creek Watershed. As such, finalization of the TMDL for this watershed should be delayed until additional in stream data are collected and this hypothesis is confirmed or refuted. (1, 6, 13)

Response: The statement in the TMDL meant that it was possible that the full benefits of past point source reductions (to 2 mg/L TP) had not realized their full benefit, not that nutrients are not a problem in these waterbodies. This statement, and the paragraph of which it is part, has been changed to reflect the Department's current understanding of the situation.

Comment: PADEP failed to include a list of the specific safety factors and their values which are built into the equations of the AVGWLF computer model or input directly into this model. This is a significant omission. The Borough requests that PADEP provide this information in a new draft TMDL for public comment prior to finalization. (1)

Response: It is unclear what is meant by “safety factors” included in the AVGWLF model since there are no model parameters or data sets identified as such (nor are “safety” factors explicitly used in the model). The modeling approach has been rigorously tested in Pennsylvania, is approved by EPA, and uses data sets reflecting “real and actual” watershed conditions as described in Section B1.0 and Appendices A, B and D. An explicit “margin of safety” factor is also explicitly used as described in the corresponding sections for each sub-basin.

Comment: PADEP failed to include a list of the specific stream flow values for each sub-basin which were utilized in the AVGWLF computer model [for sediment]. This is also a significant omission. The Borough requests that PADEP provide this information in a new draft TMDL for public comment prior to finalization. (1)

Response: Stream flow values for AVGWLF were not provided for AVGWLF since the model does not utilize stream flow values to predict loads. Rather, as described in Section B1.2, it is a watershed-based loading model that is used to estimate nutrient and sediment loads to water bodies within a given basin (it also predicts water volumes leaving a given basin for different time periods). Actual climate (i.e., precipitation and temperature) data are used to drive the model so that flow from a sub-basin outlet accurately reflects changing hydrology due to changes in climate. Again, as described in Section B1.4, simulated results were compared with observed loads recorded at a downstream water quality monitoring station (WQN 121) to verify that simulations were being performed correctly.

Comment: Based on all of the technical information and data provided in the proposed TMDL assessment regarding the AVGWLF computer model, it appears that the sediment TMDL for this sub-basin is simply driven by the input value for “transitional land use” in the Year 1992 and 2000 model runs. Transitional land use was considered to be new development (built after 1992) or construction sites. In the Year 1992 model run, the sediment load from this source was zero and in the Year 2002 model run, the sediment load from this source was 69,051 lbs/year. We find these values suspect due to the fact that (1) the same erosion and sedimentation controls were in place during both time periods, in fact PADEP has required erosion and sedimentation controls since the mid 1970s and (2) development was occurring in this sub-basin in 1992 and numerous construction sites existed then as they do today. We request that PADEP utilize more realistic input data for “transitional land use” in the AVGWLF computer model as part of the preparation of a new draft version of the TMDL assessment for public comment. (1)

Response: PADEP agrees with the implied observation that the load from “transitional” (i.e., developing) land within the sub-basin should not have been entirely allocated to the last year of the period simulated (i.e., 2000). Instead, it would be more reasonable to assume that development trends were more or less similar for each year of the time period used (1992-2000). Given this, it would be reasonable to assume that the 69,051 lbs shown in Table C5.3 on page 73 of the TMDL document would be less when

apportioned over an 8-year period. Consequently, the estimated current yearly load from “transitional” land has been reduced to 8,631 lbs ($69,051 / 8 = 8,631$). The sediment load calculations and allocations shown in the relevant tables in Section C5 have been revised to reflect this change.

Comment: PADEP failed to include a list of the specific stream flow values for each sub-basin which were utilized in the AVGWLF computer model [for point sources]. This is also a significant omission. The Borough requests that PADEP provide this information in a new draft TMDL for public comment prior to finalization. (1)

Response: As described in Section D3.2, low-flow conditions (i.e., 7Q10 flow) were used to simulate in-stream concentrations during conditions especially vulnerable to excessive nutrient input. Based on an analysis of stream gage data available from USGS, it was determined that the 7Q10 flow is equal to about 28.9 cfs at the outlet of the Neshaminy Creek watershed. Such a flow occurred during a 4-week period in August 1995. Consequently, to simulate low-flow conditions throughout the basin, weather data for this particular period were used in the AVGWLF model in order to predict loads from non-point sources of pollution. Given the nature of a 7Q10 event, the precipitation (and therefore the resultant non-point source loads) were negligible under these conditions. In other words, essentially no loads would be expected from upland sources, and only a very small amount of nutrient input would be expected from groundwater (i.e., base flow) and septic system sources.

Comment: Page No. 14 of the proposed TMDL assessment indicates that groundwater monitoring data were utilized to estimate groundwater nitrogen and phosphorus concentrations within each sub-basin. However, PADEP failed to provide a list of the groundwater monitoring station locations, the time period relied upon and the values which were utilized. This is a significant omission. The Borough requests that PADEP provide this information in a new draft TMDL for public comment prior to finalization. (1)

Response: Groundwater monitoring data available in the area were used to *verify* that estimates of groundwater nitrogen and phosphorus computed by AVGWLF were being done correctly. Figure A below shows a map of available monitoring wells used to verify estimates of groundwater nitrogen and phosphorus used by AVGWLF. The data were compiled in 1999, and ranged in value from 0.02 to 0.17 mg/l for phosphorus, with a median value of 0.04 mg/l. The wells with the highest concentrations (0.11, 0.12 and 0.17) are located in the lower part of the basin, and are shown in yellow in Figure A. Depending on the land use/cover found in each sub-basin, the phosphorus values estimated by AVGWLF typically ranged from about 0.02 to 0.05 on a sub-basin basin.

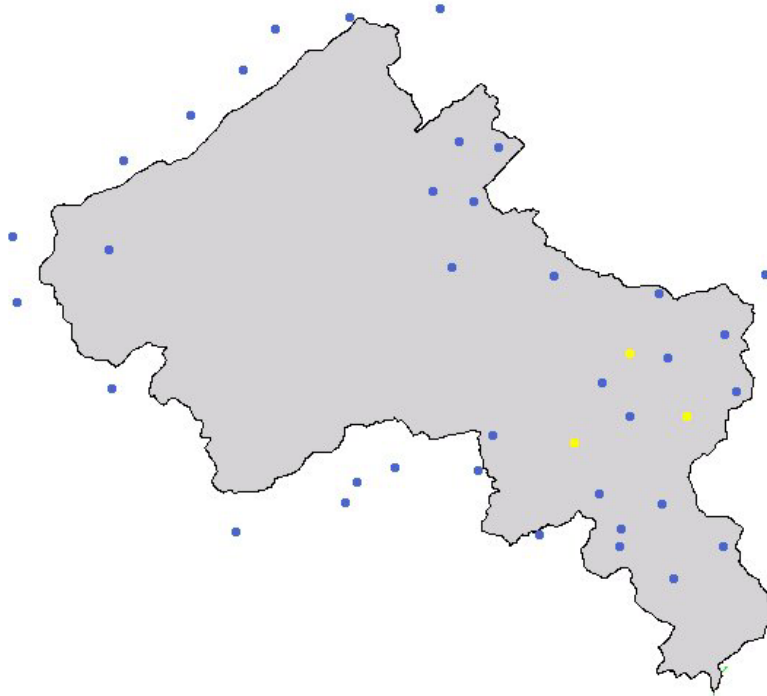


Figure A. Groundwater monitoring well locations.

Comment: PADEP's assessment indicates that a representative critical low-flow period was determined to occur for the watershed during the 4-week period of August 1995. During this time period, the actual monthly average discharge flow from the Borough's WWTP was 1.38 mgd, the total phosphorus concentration was 0.57 mg/l and the total phosphorus loading was 6.5 lbs/day. The Borough therefore requests that the PADEP consider the impacts of impoundment discharges and actual values for dry weather discharge flows, phosphorus concentrations and phosphorus loadings for the municipal treatment facilities in its baseline analysis prior to finalizing the TMDL. (1)

Response: Values for this discharge have been changed to reflect the data submission.

Comment: Page No. 238 of the proposed TMDL assessment states that PADEP utilized permitted discharge flows and permitted phosphorus discharge concentrations for the municipal treatment facilities under low flow or Q_{7-10} conditions to establish the necessary point source reductions. We disagree with this approach as it does not represent actual conditions and is overly conservative. None of the municipal treatment will ever be discharging at their permitted flows during dry weather conditions since their flows are directly impacted by water use and rainfall. As such, the use of these flows in the computer model to determine necessary point source reductions, is arbitrary and capricious. The Borough requests that PADEP consider utilizing average discharge flows in conjunction with average stream flows (for the

reasons noted previously which indicate that the low-flow period is not the critical period) to determine if point source reductions are necessary in a new draft TMDL for public comment prior to finalization. (1)

Response: The Department did not utilize permitted TP concentrations because the streams are already impaired at existing levels. Department regulations require point source impacts be evaluated at Q₇₋₁₀ (i.e. the critical condition). At the public meeting and model work session, the Department urged dischargers interested in submitting actual discharge data for August 1995 to do so. Several dischargers submitted such data and those data were used in modeling the Q₇₋₁₀ existing condition.

Comment: It seems the Q₇₋₁₀ flow of 28.9 cfs in August 1995 was too high to be all from point sources. As shown in Table D3.6, page 237, the total average point source flow in 2000 was just 16.1 mgd, or 86%, as compared to the total stream flow of 28.9 cfs (18.7 mgd) in August 1995. Furthermore, monthly point source flows during August 1995 Q₇₋₁₀ flow period should be much lower than the average annual flow in 2000, bringing the percentage of point source contributions during Q₇₋₁₀ period even lower. For example, the Country Crossing STP in Warwick Township (Permit No. PA0056421) was not built in 1995, and had an average annual flow of 0.039 mgd in 2000. The Fish Creek STP in Warwick Township (Permit No. PA 50148) had an average monthly flow of 0.326 mgd during August 1995, or 45% lower as compared to the average annual flow of 0.592 mgd in 2000. (2)

Response: Country Crossing STP was included at 0.03 mgd to represent the existing condition under 7Q₁₀ flows even though it was not built in 1995. The Fish Creek STP existing condition flow has been changed to 0.326 mgd as requested. The existing condition model run is not intended to replicate August 1995 conditions, rather it is to simulate current discharges under low flow conditions.

Comment: The Green Street STP in Borough of Doylestown (Permit No. PA0021181) had an average monthly flow of 0.312 mgd during August 1995, or 48% lower as compared to the average annual flow of 0.603 mgd in 2000. The Harvey Avenue STP in Borough of Doylestown (Permit No. PA0021172) had an average monthly flow of 0.483 mgd during August 1995, or 22% lower as compared to the average annual flow of 0.617 mgd in 2000. (5)

Response: The Green Street STP existing condition flow and the Harvey Avenue STP existing condition flow have been changed to include the submitted data.

Comment: The Tradesville STP in Warrington Township (Permit No PA0056758) was not built in 1995, and had an average annual flow of 0.151 mgd in 2000. (3)

Response: Tradesville STP was included at 0.09 mgd to represent the existing condition under 7Q₁₀ flows even though it was not built in 1995. The existing condition model run is not intended to replicate August 1995 conditions, rather it is to simulate current discharges under low flow conditions.

Comment: The Park Creek STP in Horsham Township (Permit No. PA0051985) had an average monthly flow of 0.320 mgd during August 1995, or 43% lower as compared to the average annual flow of 0.560 mgd in 2000. (4)

Response: The Park Creek STP existing condition flow has been changed to include the submitted data.

Comment: We suggest the DEP tally up the monthly flows by all point sources in August 1995, which should be readily available in DMR reports or Chapter 94 reports. The difference between this total point source flow and the total stream flow (28.9 cfs) would have been contributed by non-point sources, most likely from reservoir or dam discharges in this critical low flow period. Had any of these non-point source flows contained significant phosphorus content, it would have impacted the strategy of aiming at reducing only point source phosphorus discharges during the critical low flow period proposed in the TMDL. It would also be conceivable that reducing the non-point source phosphorus loading during the low period could be more effective, or the point source discharge reduction might not need to be so extensive. (2, 3, 4, 5)

Response: Data pertaining to permitted low flow releases from reservoirs in the Neshaminy Creek watershed have been collected and put into the model. Concentration data exists for Lake Galena (Peace Valley Reservoir) which is included on the 1996 303(d) list for nutrient over-enrichment. Water quality data from Lake Galena shows maximum bottom total phosphorus concentrations of about 0.8 mg/L. Worst-case scenarios of 0.8 mg/L TP concentrations in the permitted low flow releases were assumed in the model run for Lake Galena, the reservoir located on Core Creek, and the reservoir on Pine Creek. The only other permitted reservoir release in the Neshaminy Creek watershed is Springfield Lake. A conservatively high concentration of 0.4 mg/L was used for this release because it is not impaired by nutrients nor are any of the streams draining into or flowing out of the reservoir. Therefore, concerns regarding the flow augmentation from the reservoirs during low flow periods have been addressed in the TMDL.

Comment: If new numeric criteria will be implemented in 2007, it leaves too short of a period for us to comply with an intermediate goal (0.8 mg/L) now and then have to comply with a stricter goal in the near future, as it'll most likely affect the best technology selected to reach the different goals. We suggest either setting an ultimate goal in one step; or setting an intermediate goal for now and pushing the ultimate goal further into the future (8-10 years?) to better facilitate planning and budgeting by municipalities. (2, 3, 4, 5)

Response: The goal of numeric criteria is not yet completed and therefore not available at this time. The second option suggests setting an intermediate goal and pushing the ultimate goal 8-10 years into the future. The Department believes that the TMDL likely fits into this category. However, no further reductions will be necessary if the intermediate goals bring the water bodies into water quality standards attainment.

Further, the Department does not believe that most facilities will need additional treatment to meet the 0.8 mg/L goal proposed by the TMDL.

Comment: Page 12 – Section B1.3.1 The Hydraulic Sub-model, Second Paragraph, Line 2:

“...Mean water depth is defined as the ratio of water surface area to the top width...”

It seems it should be “the ratio of water cross-sectional area to the top width”, or clarify the definition of *mean water depth* (same definition was also in the STREAMPLAN User Manual, pp. 11). (2, 3, 4, 5)

Response: The correction has been made. Thank you for the clarification.

Comment: Page 239 – Section D3.4 Additional Expected Phosphorous Reduction from Non-Point Source Loads, Second Paragraph, Lines 4-6:

The percentages should be 0.04%, 200%, and 0.08%. The last percentage, 0.08% was also verified by the last 2 columns in Table D3.8, pp. 240, where each “Associated P Load” is 0.08% of “Reduced Sediment Load,” except for Lake Galena. (2, 3, 4, 5)

Response: The correction has been made.

Comment: Page 225 – Third Paragraph, Lines 6-7:

“...the number of potential observations is approximately $3,744 = 26 \text{ facilities} \times 12 \text{ months} \times 3 \text{ years} \times 4 \text{ parameters}$.”

Since DEP counts discharge concentration and loading of each parameter as separate permit exceedance, the total potential observations should be approximately doubled at 7,488. (2, 3, 4, 5)

Response: The correction has been made.

Comment: CRITICAL STREAM FLOW MUST BE INCREASED TO ACCOMMODATE WWTPs DISCHARGING AT DESIGN FLOW. 7Q10 is a statistical value derived from actual historic data. Typically, WWTPs discharge at 40% to 60% of design-average flow during drought conditions. For the Neshaminy Creek, the combined Annual Average flow for all WWTPs is only 51% of the total Permitted Flow, which means that at critical low flow periods the WWTPs are discharging approximately 20% to 40% of total permitted flow. (6)

Response: Several dischargers commented at the public meeting, the model work session and through written comments that the flows used in the existing conditions model runs did not accurately reflect their low flow discharges. The Department stated on several occasions in different forums that it would accept discharger submitted data on

low flow (August 1995) discharges and use those values in the model. The Department received several data submissions and applied them as requested.

Comment: If the WWTPs are all modeled at permitted flow, then the total WWTP effluent in the creek will be 48.73 cfs (per Table D3.6). If the total flow in the Neshaminy Creek is modeled at only 28.9 cfs for assessing assimilative capacity, the WWTPs will receive unacceptably low discharge concentrations. (6)

In order to correctly address the assimilative capacity of the creek, the 7Q10 must be valued at a minimum of 60 cfs, assuming all the WWTPs are modeled to discharge at design flow. (6)

Response: It is unclear how the 60 cfs figure was determined, but the Department did perform the model run suggested with dischargers at capacity. See Sections D3.3 through D6.0.

Comment: Placing the WWTPs at design flow nearly doubles the modeled load discharged to the creek compared to the actual discharged load (assuming equal concentration). The stream flow must be similarly increased to avoid allocating loads and concentrations to the WWTPs that are only half of the quantity the Neshaminy Creek can actually assimilate at low flow.

Response: The high phosphorus concentrations under low flows is the cause of the impairment in these waterbodies, not the loads associated with higher flows. The model runs evaluated the in-stream phosphorus concentrations/reductions, so the problems associated with allocating loads are not relevant and did not factor into the reductions required by the TMDL. The more stringent allocations at higher flows are based on decreased settling and enhanced periphyton growth as velocities increase up to 1.6 fps. See Sections D2.0 and D3.3.

Comment: 7Q10 flow is not statistically justified. USGS 01465500 appears to be very proximate to the WQN Station shown in Figure B1.1. The monthly average flow for August 1995 was 42.6 cfs at USGS 01465500; the minimum 7-day average flow in August 1995 was 28.9 cfs. The second paragraph of Section D3.2 needs to be restated.

Response: There was no need to statistically derive 7Q10 because there is a gauging station on the mainstem of Neshaminy Creek. Therefore, 7Q10 was determined based on historical data, not an empirical statistical relationship that would be used on an ungauged stream. The Department agrees that the cited paragraph was poorly worded and the text has been changed to address the comment.

Comment: PADEP did not supply any statistical analysis to support that 28.9 cfs equals 7Q10 flow. There is adequate USGS data to perform this calculation.

Response: 7Q10 was derived from historical data (i.e. the minimum 7 consecutive day average flow occurring over the last 10 years). The Department does not believe that any further statistical analysis is warranted.

Comment: PADEP HAS ASSUMED UNREALISTIC FLOW SCENARIOS. The dischargers currently do not discharge at their design flows in the summer months, and it is not anticipated that this will happen anytime in the near future. The model is based on low flow conditions. The probability of all dischargers meeting their design flow at the same time during low flow conditions is highly unlikely and not a realistic basis for imposing TMDL. We submit that EPA has the leeway to consider this factor and thereby use realistic conditions. (6)

Response: It is not within the scope of the TMDL to determine the likelihood of the critical condition occurring. TMDLs must assess the worst-case scenario. So if the worst-case scenario evaluated by the TMDL was based on flows less than capacity, then the next permit issued to the dischargers would have to be consistent with those flows.

Comment: DO DATA INDICATES A VERY HEALTHY STREAM. The dissolved oxygen (DO) data presented indicates a very healthy stream. None of the proposed nutrient reductions will have a beneficial impact on benthic macroinvertebrates, since the DO is above 8 mg/l. (6)

Response: Daytime DO data tell very little about the health of the system. Dissolved oxygen is at a maximum during the daytime hours when the photosynthetic process is producing oxygen. The abundant algal growth in the streams would suggest dramatic DO fluctuations during the overnight hours when respiration and death are consuming oxygen. Follow-up surveys to the TMDL will be done to assess the diurnal swings in DO.

Comment: BASIS FOR 303D LISTING DECISION NOT PROVIDED WITH DRAFT TMDL. The Draft TMDL does not include any specific documentation regarding the existing condition of the benthic community. Only references to previous studies are included, but copies of these references are not provided, nor are any specific quantifiable conclusions presented. (6)

Response: The streams were listed due to excessive nuisance algae growth based on field observations by DEP biologists. Biological data used to determine impairment is not included in TMDLs. However, specific reports and survey data are available upon request.

Comment: THE PROPOSED TMDL WILL ACTUALLY HARM THE ENVIRONMENT. The specific WLAs presently proposed by PADEP will cause considerable increases in electricity consumption, the transportation, unloading and handling of chemicals, and substantial increases in solids production (whether chemical or biological) at most of the wastewater treatment plants.

The Draft TMDL presently proposed by PADEP will have the net effect of damaging the environment. (6)

Response: The purpose of the TMDL is to set the levels of a substance necessary to meet water quality standards. The Department encourages pollution prevention measures to minimize adverse environmental effects.

Comment: RATIONALE ON PAGE 238 QUESTIONED. The premise in the first paragraph on page 238 indicates that increased flow will equal increased concentration of phosphorus (P). It also states that higher flows will mean less settling and decreased nutrient uptake.

It is possible that higher flows will have a lower concentration of phosphorus, and therefore will lower the concentration of P in the stream. Higher velocity at lower concentration would still produce a lower concentration. If nutrient uptake does in fact decrease, then nuisance algal blooms would also decrease. Since a numerical standard for P does not exist, reducing algal blooms is the stated goal of the nutrient TMDL. (6)

Response: The rationale for more stringent effluent levels as flows increase has been observed. While it is true that the increased flows will lead to increased velocities, decreased travel times and decreased settling, the increased velocities will not decrease uptake. In fact, periphyton growth is enhanced at the greater current velocities. See Section 3.3 for the revised text and cited research documenting the increased periphyton growth with increased flow velocity.

Comment: NO REASONABLE ASSURANCE THAT THE PROPOSED CHANGES IN WWTP EFFLUENTS WILL BENEFIT THE BENTHIC COMMUNITY

A major assumption of the TMDL is that the wastewater treatment plants cause impairment of the Neshaminy Creek at low flow. However, the draft TMDL presently issued by PADEP does not present any scientific linkage or correlation between the observed benthic community and the effluent from the wastewater treatment plants.

The fact that the observed in-stream DO exceeds 8 mg/l suggests that the wastewater treatment plants are not impairing the benthic community within Neshaminy Creek. (6)

Response: The impairments in Neshaminy Creek and its tributaries are due to nuisance algae growth that is fueled by excessive nutrient concentrations. These concentrations are highest at low flows when WWTP effluent comprises greater than 75% of the total streamflow. The scientific linkage needed is between high nutrients inputs and excessive algae growth and that linkage has been well established.

Daytime DO measurements that exceed 8 mg/l do not suggest that the wastewater treatment plants are not impairing the benthic community within Neshaminy Creek.

Comment: EPA recognizes that formatting the TMDL report by individual subbasins is beneficial for clarity and organizational purposes. We suggest, for quick reference, also adding a summary section that contains a collection of impairment listings, existing loads, allocations, and reductions for each subwatershed, as well as an overall map of the Neshaminy Creek watershed with each subbasin identified. (7)

Response: The Department will post to the DEP website a summary section with the approved TMDL.

Comment: Table A1 containing 303(d) listings and sources of impairments needs to be updated, as the listings contained in the TMDL report do not reflect the final version of Pennsylvania's 2002 303(d) list approved by EPA. In particular, the "year listed" dates are incorrect for a number of segments. (7)

Response: Table A1 has been amended to reflect the final version of the 2002 303(d) list.

Comment: At the public meeting, DEP mentioned that the 60-day comment period should have been corrected to 30 days, or clarified to say that part of the 60-day comment period was conducted for the original draft Neshaminy TMDL. The public participation sections of the TMDL should be revised accordingly. (7)

Response: The appropriate sections have been revised.

Comment: It seems as though the write-up for Section C8.1.4 (p. 114, West Branch Subbasin #4) is incomplete. Also, Section C8.1.6 was omitted. (7)

Response: Section C8.1.4 is complete as presented. However, to make the section more clear, Figure C8.2 was repositioned in Section C8.1.2. Section C8.1.6 was incorrectly labeled as Section C8.1.7. This error has been corrected.

Comment: Typographic error: "NLR" should be corrected to "LNR" for all sections describing how an adjusted load allocation is calculated (*e.g.*, p. 100). (7)

Response: The typographic error has been fixed.

Comment: EPA notes that loadings for the sediment TMDLs were appropriately included in the WLA component, consistent with EPA regulations. As you are aware, a recent EPA memorandum¹ clarified existing regulatory requirements for municipal separate storm sewer systems (MS4s) connected with TMDLs, so where a TMDL is developed, a MS4 community must receive a WLA rather than a LA. This applies to all stormwater discharges from small MS4s now covered under Phase II of the NPDES Stormwater regulations, in addition to those covered under the Phase I regulations. (7)

¹

Response: The Department is aware of Phase II of EPA's NPDES Stormwater regulations.

Comment: The total loading for sediment in each subbasin was assigned as a WLA but does not specifically identify the recipient(s) of each WLA. Please clarify whether this is because each subbasin is comprised entirely of one or more MS4 communities. If this is the case, please state so in the TMDL and identify the recipient of each WLA. Also, please include a map in the TMDL report which overlaps municipal boundaries and subbasin boundaries with associated WLAs. (7)

Response: Within each section of the TMDL document that addresses a sediment WLA for a given sub-basin, additional text has been added that refers the reader to Appendix E which contains a list of municipalities by sub-basin and a map showing both municipality and sub-basin boundaries.

Comment: DEP identifies the various townships and boroughs within the Neshaminy Creek watershed designated as an MS4 (within the Philadelphia urbanized area). However, the municipalities are identified towards the end of Appendix E (Table E1) rather than within the TMDL report; further, the TMDL report does not provide a clear and direct reference to this listing. Due to the placement of this table within the document, it may not be clear that those MS4s identified are recipients of the WLAs. This should be clarified either by identifying the MS4(s) affected by the respective WLA within the write-up for that subbasin, or by citing each WLA to Table E1. (7)

Response: As described above, within each section of the TMDL document that addresses a WLA for a given sub-basin, additional text has been added that refers the reader to Appendix E which contains a list of municipalities by sub-basin and a map showing both municipality and sub-basin boundaries. Additionally, a table has been added to Appendix E that lists each TMDL sub-area for which a given municipality is responsible for a portion (or all) of the WLA. Another table showing the WLA for each sub-area was also added to Appendix E.

Comment: The TMDL does not assign individual WLAs to the municipalities within a given subbasin but, rather, assigns a categorical WLA to the group of MS4s falling within that sub-area. Since a majority of the affected subbasins are comprised of more than one municipality, and the TMDL does not describe how the WLAs are to be split up amongst them, it is unclear how these WLAs should be implemented. EPA recommends discussing the following options: (1) assign an area-weighted individual WLA to each MS4, or (2) divide the WLA equally among the municipalities within a subbasin, creating an opportunity for trading. Please describe how DEP will relate these WLAs back to the individual MS4s. (7)

Response: The AVGWLF model is most appropriate for calculating allowable loads on a subwatershed basis and that was the method used in the TMDL.

The Department believes that the scale of the AVGWLF model and its lumped-parameter nature preclude the use of option 1 in issuing WLAs to individual municipalities with a given MS4. Parameter values in AVGWLF are generated as averages for a given land use across the watershed modeled. Applying the loading rates produced from these average parameter values to small parcels of a given land use in a municipality would misrepresent the actual load from these areas in almost all cases.

Dividing the WLA equally among the municipalities within a subbasin, while it may create trading opportunities, would grossly miscalculate the contributions and WLAs for municipalities comprising a very large or very small portion of an MS4.

Comment: The use of a reference year approach for a given subbasin seems rational, considering that DEP uses a reference year during which the designated uses were attained. In the Little Neshaminy watershed, for example, siltation was not found to be a cause of impairment during a 1994 survey and 1997 assessments, and was not identified as causing an impairment until the 1998 and 2002 Section 303(d) lists. This gives a good basis for DEP to use 1992 as a reference. Additionally, various factors typically considered when selecting a reference watershed (*i.e.*, size, physical properties, geology, etc.) remain constant when utilizing a reference year approach, making more apparent the source of change from baseline conditions (which achieve applicable uses). (7)

Response: Thank you for the comment.

Comment: The use of a reference year approach versus a reference watershed approach for sediment seems to be applied differently among the various subbasins. EPA assumes that a reference year was utilized for watersheds where the primary source of sediment loadings were attributed to urban runoff/storm sewers and DEP has sufficient data for that year to show uses were attained, whereas a reference watershed was used for watersheds with high sediment contributions from agricultural activities. Please confirm whether our understanding is correct. (7)

Response: The assumptions regarding the “reference” approach used under different conditions are essentially correct with some qualifications. The “reference year” approach was used where “land development” was believed to be the primary cause of sediment problems in a given sub-basin, and where the problem was believed to be due to the degree of development that has taken place over the last decade or so. In cases where other sources of sediment have been identified (e.g., agriculture), the “reference watershed” approach was used.

Two exceptions to the above cases are the sub-basins identified as “Neshaminy Creek South #1” and “Neshaminy Creek South #3”. In these cases, it is believed that current sediment problems are not necessarily due to recent levels of urbanization. Both of these sub-basins are already very highly-developed (*i.e.*, 65-75% developed), and have not changed much over the last decade. Rather, it is believed that the high degree of urbanization in these areas is resulting in significant amounts of sediment from streambank erosion rather than upland erosion as evidenced by material presented in

Sections C14 and C16 of the TMDL document. Anecdotal evidence also provides ample proof that flash-flooding and channel erosion have been continuing problems in the lower portion of the Neshaminy Creek basins for many years.

Comment: The TMDL compares baseline conditions from 1992 to “post-impairment” conditions in 2000. Does the land use data from 2000 adequately capture land development activities to the point that the data are representative of current land use conditions? In other words, if the significant changes in land use occurred prior to 2000, and development has remained relatively unchanged from 2000 to the present, then the use of 2000 data would seem acceptable. (7)

Response: The 2000-vintage satellite data used to update land use/cover data in the Neshaminy Creek watershed adequately depicts land use/cover conditions in this area. Field visits were also made to the affected areas during the summer of 2002 to verify the updates and revisions were made as needed.

Comment: In cases where phosphorus loadings from nonpoint sources were reduced, DEP computed an adjusted load allocation (ALA) by subtracting loadings from land use/source categories that are difficult to control, or provide an insignificant contribution to the overall load (LNR). However, for nonpoint source sediment reduction scenarios, where only a WLA was computed due to MS4 designations, DEP did not make this type of adjustment. Rather, the EMPR method was applied across all sources, resulting in load reductions up to 50% from forest lands. Forested areas represent the “best case scenario” or natural conditions, and sediment contributions from these sources are relatively minimal on a per unit basis. Recognizing that a WLA remains constant regardless of the categorical reductions, EPA recommends that land use reductions be reallocated so that sediment load reductions from forest source categories either remain constant, or are more appropriately assigned. (7)

Response: The different approaches used relate to whether load reduction techniques can be best made “on-site” versus at a point before the stormwater enters a given stream. In the case of agricultural areas, for example, reduction strategies generally involve the use of “on-site” BMPs such as cover crops, strip-cropping, and conservation tillage. In this case, BMPs could be implemented in agricultural areas and not in wooded areas. However, in urbanized watersheds, typical treatment strategies often involve the treatment of *all* stormwater runoff from a mixed-landuse area (via wetlands, detention basins or stream buffers, for example) prior to its entering a stream reach. In this latter case, it is often difficult to separate the runoff from the various sources, and it often makes more sense to treat all runoff from an urban area that has other “non-urban” areas inter-mixed throughout. Consequently, for areas where sediment WLAs have been identified to address “development-related” problems, all reductions are treated uniformly.

Comment: The approach taken to address nutrients from point sources, and the reductions imposed on point source discharges, in the TMDL are based on DEP’s Best Professional Judgment (BPJ) and interpretation of Pennsylvania’s narrative criterion due

to the absence of numeric nutrient criteria. Please discuss in more detail the basis for DEP's interpretations and level of instream water quality improvements that are expected. Please discuss in the respective TMDL reports how the TMDL will result in the attainment of the designated uses. Please confirm in the TMDL report that the existing impairments ultimately designed to reducing instream algal growth to below nuisance levels, which can be considered more of an impairment to aesthetic uses rather than aquatic life uses. We do note, however, that excessive algal growth can be a precursor to DO problems, which can then potentially pose aquatic life use impairments. (7)

Response: Text has been added to the report to address the comment.

Comment: The TMDL mentions that the overall objective when modeling the required phosphorus load reductions was to determine the point source phosphorus effluent limits at which there was an improvement to existing instream water quality conditions (p. 236). However, the modeling scenarios only estimate simulated loadings at the four outlets. Please describe in detail how the reduction at all four outlets assures improvement in phosphorus levels for currently impaired segments throughout the Neshaminy Creek watershed. Please document how the anticipated phosphorus reductions in listed segments will be associated with specific improvements in water quality and how those improvements can be expected to achieve and sustain the applicable uses. (7)

Response: The modeling scenarios simulate in-stream conditions at many points including the headwaters of all modeled segments along with confluences of modeled tributaries. Results are presented at four locations that represent critical areas downstream of multiple point source inputs. It is obvious that reductions at these points along with documented reductions at the nutrient sources would result in reductions at all points in between. The TMDL states in several places that it is based on an interpretation of the Department's narrative criteria and is a staged TMDL. The Department believes that the reductions called for in the TMDL will result in decreased algal growth at all points in the watershed and attainment of uses. However, if it is determined after implementation of the TMDL that the water bodies require further nutrient reductions, then actions will be taken to bring about such reductions. Section D6.0 details future analyses that will be performed in order to assess the use attainment in these streams.

Comment: The TMDL identifies estimated phosphorus concentrations under existing and future load conditions (Table D3.7), and higher instream concentrations are projected for the upstream outlets. Generally speaking, factors including, but not limited to, hydrology, shading, and riparian buffers can increase the uptake of nutrients so that, depending on the stream order, higher instream phosphorus concentrations will not result in nuisance algal growth. Please indicate whether this is the case for the Neshaminy Creek watershed and provide this type of explanation in the TMDL. (7)

Response: The commentator's assessment is correct. One number (i.e. one concentration) does not fit all streams based upon, but not limited to, the factors listed. If

one concentration was acceptable for all streams, numeric criteria for nutrients would have already been developed.

Comment: As described in the TMDL, DEP will need to confirm whether the phosphorus reductions assigned in the TMDL are rigorous enough to reduce instream algal growth to below nuisance levels through follow-up monitoring, and revisit the TMDL, if necessary. EPA has established TMDLs across the country with a similar staged approach, and there is typically a schedule for follow-up monitoring to measure progress. Please describe when DEP plans on conducting re-assessment surveys. EPA requests that DEP collect diurnal DO samples, in addition to measuring nutrient and organic enrichment levels, following implementation of the TMDL. DO could become a concern if excessive algal growth continues and adversely affects aquatic life, especially since trend data show a gradual decrease in DO concentrations. (7)

Response: DEP intends to reassess the streams after all permits are reissued in accordance with the TMDL, compliance schedules are accommodated, and sufficient time has elapsed in order to allow the water bodies to respond to the nutrient reductions prescribed by this TMDL. The timetable for these surveys to determine use attainment cannot, and should not, be set at this time. However, Section D6.0 details the work that will be done pre-implementation to establish a baseline, and post-implementation (after the items listed above are satisfied) to determine the impact of TMDL reductions and use attainment status.

Comment: The TMDL states that DO concentrations at the monitoring station have consistently been recorded above 8.0 mg/L, which is in compliance with water quality criteria. Please provide the DO data and identify the times of day when these samples were taken. Please provide documentation that diurnal variations in DO achieve water quality criteria. (7)

Response: The cited DO concentrations were daytime measurements and do not allow for any direct interpretation regarding the health of the streams. The Department has no diurnal DO data to suggest that diurnal variations in DO achieve water quality criteria. Conversely, the Department has no diurnal DO data to suggest that diurnal variations in DO achieve water quality criteria do not meet water quality criteria. As discussed in Section D6.0, diurnal DO data will be collected in the near future to assess the impact of current algal levels on diurnal DO and post-implementation to ensure that all applicable DO criteria are met.

Comment: As explained in Section D of the TMDL, the total phosphorus limit that must be achieved by a point source is based on the flow of its discharge. Consequently, this presents more than one possible WLA for a given point source. One of the essential elements of a TMDL is that it identifies a total allowable load as well as individual WLAs and LAs. Please specify the flow-based limits on a loading basis in pounds per unit time. Please identify the range of percent reductions that will occur with the phosphorus load reductions sufficient to achieve applicable uses. (7)

Response: Table D3.6 has been revised to include the total allowable load by facility in lbs/day.

Comment: The Neshaminy Creek Watershed contains a number of flood control lakes that discharge minimum flows within the watershed during the summer months. There are a number of issues with respect to these lakes that should be addressed by DEP in conjunction with the phosphorus load in the Watershed. Is DEP aware of any sampling undertaken to determine the concentrations of phosphorus from these discharges during the summer months? (8)

Response: The Department has water quality data for two of the impoundments, Lake Galena and the reservoir on Core Creek. These lakes have had Phase I Clean Lake Studies performed where concentration data were collected.

Comment: Since the discharges are from the bottom of these lakes, do the discharges contain elevated concentrations of nutrients that would have an impact on the stream quality during the summer months? (8)

Response: The phosphorus concentration in the bottom of stratified lakes is often elevated due to diffusion of phosphorus from the sediments under anoxic conditions.

Comment: Do the discharges from these lakes contribute to the nutrient loadings to the stream during 7Q10 periods? (8)

Response: Yes, there are four permitted low-flow releases from reservoirs in the Neshaminy Creek watershed. These releases have been accounted for in the final model runs performed. A more complete explanation of the addition of low-flow releases from the reservoirs is provided in Section D3.3.

Comment: DEP has focused on low flow periods as those critical to the health of a stream. However, if point-source discharges are expected to expend significant money to install capital equipment to remove phosphorus, then DEP should only require that low plant flows be treated. A treatment plant should not have to develop a plan to treat four to six (4-6) times its dry period flows in order to handle wet weather flows, when the dry period flows are of most concern to DEP. (8)

Response: 7Q10 is the most critical period, but not the only critical period. So while the dry period flows are of most concern, they are not the only concern. Phosphorus enriched effluent discharged to the streams during the growing season, when light and temperature foster algae growth, provide a threat to water quality that must be protected against. The TMDL effluent limits will apply from April-October.

Comment: Pages 226 and 227 of the proposed TMDL provide nutrient loadings for the Hatfield Township Municipal Authority for the years 1988 and 1999, respectively. According to the charts provided in the proposed TMDL, the Hatfield Township Municipal Authority discharged 90,077.7 kg/yr of nitrogen in each of these years. It is

highly unlikely that the loadings for both 1988 and 1999 were exactly the same. Please explain how these values were obtained and, if there is an error, whether it is isolated and whether it has any impact on the calculations within the proposed TMDL. (8)

Response: The values presented in the table were calculated using DMR data for the years presented. Table D1.2 is accurate, but the correct value for the kgN/yr-Actual for Hatfield Township Municipal Authority in Table D1.3 is 45,244. The Tables have been revised to include the correct numbers. The loads presented in Tables D1.2 and D1.3 of the TMDL, were used only for illustrative purposes and had no impact on the modeling effort performed in the TMDL development.

Comment: Is the definition of nuisance algae as used in the proposed TMDL any algae that adversely affects the fish population? Apparently, the algae is not affecting the dissolved oxygen content of the West Branch of Neshaminy Creek; therefore, there is no affect on the fish population. (8)

Response: The definition of nuisance algae as used in the proposed TMDL is any algae that affects the aquatic life in the stream. The Department disagrees with the assertion that algae is not affecting the DO. Please refer to previous responses to similar comments regarding inferences made from daytime DO readings taken in the watershed. Please also see the next response regarding supersaturated DO conditions observed in the watershed during the most recent surveys of the Neshaminy Creek watershed.

Comment: Has DEP undertaken any stream studies on the West Branch of Neshaminy Creek that indicate an improvement in the condition of the stream since the stream was initially listed as being impaired? (8)

Response: A follow-up survey was performed on the West Branch of Neshaminy Creek later in the summer of 1998 to confirm the listing. The macroinvertebrate community was still comprised entirely of pollution tolerant taxa. DO was over 11 mg/l indicating supersaturated conditions brought on by excessive productivity that will lead to extreme DO fluctuations during the overnight hours when the algae respire.

Comment: The Forest Park Water treatment plant has a positive effect on the phosphorus load in Lake Galena and, in turn, on the North Branch of Neshaminy Creek. (9)

Response: The Department agrees that the Forest Park Water treatment plant provides a water quality benefit to Lake Galena. The diversion inputs high quality water to the lake, while the withdrawal pulls an equal or greater amount of phosphorus enriched water from the lake leading to a net load reduction in Lake Galena.

Comment: I am commenting here about some of the data about our facility as presented in the report. In particular, in Table D1.3 on page 227, is data for kg of Nitrogen and Phosphorus for 1999. Upon review of our DMR reports for that year, none of your reported figures for both Permitted and Actual, of both N and P, match up with data as

permitted and reported by us on the DMRs. I have summarized our 1999 DMR data on the attached spreadsheet for your review. I believe the level of inaccuracy is significant; if it was only minor I would not be commenting here. (See the comparison table at the bottom of the spreadsheet). The most significant of which is the figure of actual kg-N, which as presented (52,104 kg), is about 45% over the allowable permitted amount. You can see on the attached spreadsheet that this is far from the truth; we have discharged only 38% of permitted total (14,745 kg). Where did the 52,104 kg figure come from?? (10)

Response: The discrepancy between the Department's numbers and those submitted by the commentator is the time period for which the loads are calculated. The Department's numbers presented in the TMDL are annual loads for 1988 and 1999. The loads calculated by the commentator used data for only four months of the year (July-October).

It should be noted that the loads referred to above, and presented in Table D1.3 of the TMDL, were used only for illustrative purposes and had no impact on the modeling effort performed in the TMDL development. The table was included only to show the difference in discharged loads over that time-frame.

Comment: I have two main concerns with the data. First, this is a public document, easily available to anyone on the internet. Anyone who reads it will consider the information to be factual, accurate and truthful. Even though the report says that Nitrogen is not a critical factor in the TMDL, certain parties that read the report would be led to believe that our facility is failing to do its job properly for Nitrogen removal; which is far from the truth. (Even if this data is corrected in the final report, this damage may already have been done).

Secondly, the fact that our one facility has inaccurate reported data, leaves one to question the reliability of any of the data as reported for all the facilities. (10)

Response: No conclusions regarding the adequacy of nitrogen removal should be made from the numbers presented in the table.

Comment: The data for Avg. Flow for 2000, in Table D3.6 on page 237, is a mystery. The Avg. Flow (MGD) for Chalfont/New Britain is reported to be 2.50. Actual DMR-reported average flow for the year was 3.14 mgd. (10)

Response: The Chalfont/New Britain STP flow has been changed to include the submitted data.

Comment: One other issue I would like to question is the determination/calculation of the 1.0, 0.8, 0.5 mg/l limitations for Phosphorus. Although 1.0 and 0.8 are described as being derived from "model runs", there seems to be little explanation as to how the figure of 0.5 mg/l is derived for new or expanded facilities. This figure seems to come out of the blue in the report with no explanation where it came from. (10)

Response: New facilities discharging to the streams will increase the flows which will increase water column TP concentrations and enhance periphyton growth. Therefore, a new facility discharging at 0.8 mg/l would lead to higher in-stream concentrations than those called for in the TMDL.

The Department believes that it is reasonable and cost-effective for newly constructed and expanded facilities to achieve 0.5 mg/l TP, an effluent limit that will help ensure that water quality standards will be met.

Comment: The explanation of the difference between the 1.0 and 0.8, although I understand what is said, seems unworkable from a DEP permitting standpoint. (10)

Response: The Regional permit writers are aware of the TMDL requirements and believe that the permits can be written in accordance with the TMDL.

Comment: Understanding that the role of the TMDL is to reduce direct pollutant loadings on the Neshaminy Creek, we feel that more comprehensive measures should be emphasized when determining future actions that should be implemented to improve the biological health of the stream beyond or in concert with reductions in phosphorous discharges from municipal point sources. It is our feeling that these measures (residential conservation, stormwater infiltration, land application of effluent, I&I reductions) should be presented more prominently as means to attain the stream's designated uses. These efforts, in concert with phased reductions in nutrient discharges offer an economical approach to water resource protection. (11)

Response: Although the Department believes that implementation of additional measures, such as land application of effluent, inflow and infiltration (I&I) reductions, and water conservation and re-use in concert with phased reductions in nutrient reductions are viable tools to attain the stream's designated use, a comprehensive implementation plan is beyond the scope of the TMDL. The purpose of the TMDL is to quantify the amount of pollutant loading that can enter a water body and still maintain its uses. The TMDL report does mention conservation measures in hopes that communities affected by the TMDL will employ the measures, resulting in improved water quality.

Comment: A major point that came out of the public meeting held on November 3, 2002 was that under low flow conditions, municipal wastewater (WWTP) effluent constitutes over 90 percent of the flow in the Neshaminy Creek. The TMDL document mentions land applications, inflow and infiltration reductions, and water conservation and re-use as environmentally sound methods to reduce pollutant loadings from WWTP's. These methods not only reduce pollutant loadings from WWTP's but also help to improve natural stream baseflows. Increased baseflow will improve the stream's assimilative capacity for nutrients as well as providing ancillary benefits to the ecosystem. When applied in concert along with stormwater infiltration promoted by NPDES Phase II and the new Act 167 Plan for the watershed, these methods make improvements in groundwater recharge and natural stream baseflow more probable. (11)

Response: The Department agrees that additional benefits will be provided by employing the said conservation measures.

Comment: Opportunities to meet the mandates of several regulatory requirements with cooperative programs should be utilized wherever possible. Municipal government, wastewater dischargers, and water suppliers should be encouraged to enlist their constituents in these efforts as part of the larger effort to improve the waters of the Commonwealth and health of our communities. (11)

Response: The Department believes that public outreach and involvement is a key step to accomplishing environmental goals and supports collaborative efforts in reaching these goals.

Comment:

Trails Meeting TMDL report 11/03/03 and Comments:

Executive summary: (some of this may be my (i.e., the commentor's) opinion)

As a result of a 1995 lawsuit vs. U.S. EPA by environmentalists for not acting to develop Proposed Total Maximum Daily Load (TMDL), PA EPA is acting to comply with the agreement. The national minimum goal is all waters be fishable and swimmable. (MIN) The Neshaminy Creek is impaired due to High concentrations of Phosphorous. This is only one of the main problems, but was selected since it had the most impact on algae growth. This growth occurs at low flow conditions. Under these conditions, stream flow is predominantly discharge effluents. This is groundwater pumped to homes and businesses used and sent to wastewater treatment plants. The other problems are sedimentation and variable water flow, among a few others.

This meeting was mostly for the sewage treatment plant operators and people involved. Since the Neshaminy is an integral part of the trail system and groundwater education should be a benefit of open space funds, I thought it was interesting to learn more.

This is a proposed method of cleaning a pollutant, and the PA EPA is looking for some comments by the plant operators, and the public. They hired consultants at PSU, and spoke with industry, and are repeating development of TMDL, which was performed for other watersheds throughout the state, and nation.

I am not an industry insider, but I will forward a few comments:

I am glad there are efforts being made to develop and try to meet some standards to make our waters cleaner. They look clean, but I know they need improvement. I worked at a Pharmaceutical company as a researcher for about 10 years and can understand the scientific methods and statistical processes. This was a second continuation of the comment period, but the plant operators complained they only had 2 weeks to provide comment with the data they supplied to the evaluation in the PSU study model. It seems to me that they knew what was being proposed long ago and probably already know what they may have to do with technology and construction to make these improvements.

Hopefully they have contributed information to the EPA, but no mention of that was included from either side.

The EPA is looking for some progress. I did not hear anything from the industry about what they may do although they said they consider themselves environmentalists. Granted any improvements may be costly, but this is where there needs to be open communication. I heard that one of the potential solutions is to use sand filters. Actually I'm surprised this is not a normal part of plants' methods. At any rate, a phase in period could include tiered levels of meeting the requirements. Since the main problem is at low flow conditions, maybe the most stringent filtering can be required at times when the normal creek flow is below 40% of average flow. I'm sure the EPA was looking for other creative solutions, but I don't think this industry is being supportive. That is why we are getting around to the results of the lawsuit.

I know our creeks are burdened by being so near such a large population, but that is even more reason to try and clean them up by having workable standards. The fact that people are approving open space initiatives across the state shows that we are concerned with the environment, and cost should be balanced with benefit. But there are other places where this pollutant is one tenth of what we are allowing here, and this should change. I believe the industry, each plant and municipality, is bringing this problem to a head, by not acting proactively. (12)

Response: The Department of Environmental Protection (DEP) is pleased that the commentor shared information about the TMDL and public meeting with his organization, thereby raising awareness and increasing communication about this important environmental program. DEP wants to clarify a few points. First, the notice of the meeting was made by publication in the *PA Bulletin* and newspaper so that all interested parties could participate. Stakeholders other than the attendees were in no way excluded. The comment period was extended for 30 days from October 18, 2003 to November 17, 2003 and the proposed TMDL was not available before that date. Therefore, no stakeholder knew what the TMDL contained before that time.

TMDL meetings provide an opportunity to discuss the process with stakeholders and the Department appreciates the input received. All comments are considered in developing the final TMDL that is submitted to US EPA for approval. TMDLs are implemented by controls on point source discharges and nonpoint sources (NPS), as applicable. Point source permits are required to reflect the waste load allocations in TMDLs and NPS controls are encouraged.

Comment: In the case of both sediments and phosphorus, proposed load reductions are the same for all sources. Although this approach might be the easiest to administratively implement, it does not consider the comparative (a) magnitude of the contribution from each source, (b) ease or difficulty of obtaining the reductions, and (c) associated costs. Consideration of these factors may result in more equitable allocations between sources while still achieving the overall TMDL. (13)

Response: While the allowable loads are allocated by land use, only the total allowable load must be met. Therefore, it is acceptable for reductions by landuse to deviate from those proposed in the TMDL, so long as the total loads goal is achieved. Individual municipalities and dischargers are encouraged to pursue the most cost-effective means of meeting the TMDL total load goal.

Comment: As noted in the Executive Summary and elsewhere in the proposed TMDL, Pennsylvania does not have water quality criteria for sediment or phosphorus. To develop TMDLs, PADEP interpreted its general narrative criteria by using a modeling approach. A stream loading is proposed for both parameters, but the specifics of the derivations and how they translate to in-stream concentrations protective of the designated use is not adequately explained. Interpretations or translations of narrative criteria should be scientifically defensible and subject to public review prior to establishing a regulation that will impact NPDES permit limitations.

Response: The TMDL explains in detail the derivation of TMDL goals for sediment as calculated using both the Reference Watershed and the Reference Year approaches in Section 2.1. The Department believes that meeting annualized sediment loading rates comparable to those in watersheds or during time periods where uses were attained is defensible and protective of the designated uses in the Neshaminy Creek watershed.

The applied interpretation of the narrative criteria for phosphorus resulted in anywhere from a 22-33% reduction in in-stream phosphorus levels in the watershed. The Department believes that these reductions will result in attainment of uses in the Neshaminy Creek watershed. In the event that the reductions required by the TMDL are not substantial enough to achieve use attainment, the staged nature of the TMDL will result in further reductions after the detailed analyses discussed in Section D6.0 are performed. All TMDLs, by nature, are iterative processes in which reductions are prescribed, implementations plans are designed and carried through, and the effects of the reductions are analyzed with respect to the ultimate goal of use attainment in the waterbody. If the water body is still not meeting water quality standards, then a revised TMDL is established and implemented. The TMDL for the Neshaminy Creek watershed is no different.

The draft TMDL was noticed in the PA Bulletin and the Philadelphia Inquirer on October 18, 2003. At that time, the TMDL was available on the PA DEP website as indicated in those notices and subject to public review. The 30 day comment period required by regulation was provided.

List of Commentators

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Borough of Lansdale

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 5. John Butler, Director of Operations & Project Management
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 7. Evelyn S. MacKnight, Chief
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 8. Steven A. Hann, Esquire
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 9. Steven A. Hann, Esquire
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 10. John E. Schmidt
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13. Christine H. Porter
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By direction of the Commander