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VIA EMAIL & CERTIFIED MAIL

July 27, 2015

Ms. Lenka Berlin
US EPA Region III, 3WP30
1650 Arch Street
Philadelphia, PA 19103

Subject: Wissahickon Creek TMDL

Dear Ms. Berlin:

Upper Gwynedd Township (UGT), Montgomery County, Pennsylvania, submits the following comments to the United States Environmental Protection Agency (EPA) regarding the proposed Total Maximum Daily Loads (TMDLs) for the Wissahickon Creek Watershed as posted on EPA's website May 20, 2015.

Upper Gwynedd Township (UGT) is an interested party with respect to the Wissahickon Creek draft TMDLs because UGT is a direct discharger to the Wissahickon Creek and Upper Gwynedd is in the MS4 program and discharges storm water to the Wissahickon Creek.

The proposed TMDL limit for phosphorus would result in an NPDES permit limit of 0.04 mg/l or less. For the reasons stated below, this limit is not scientifically justified, is economically burdensome, and has not followed proper regulatory procedure in its development.

We believe there are several critical deficiencies in, and issues raised by, the basis for and approach to this TMDL. These concerns are set forth below.

TMDL COMMENTS FOR WASTEWATER DISCHARGE

1. The TMDLs represent a significant departure in thinking, from the scientific and regulatory approaches applied to nutrient reduction issues over the last 10 years, without a convincing basis for doing so.

Because Pennsylvania does not have numerical water quality criteria for nutrients, the basis for any TMDL was and still is the Pennsylvania Department of Environmental Protection's (PADEP's) narrative water quality criterion for nutrients. PADEP has consistently interpreted this narrative criterion as dependent upon a showing that nutrients are causing excessive algae and/or dissolved oxygen fluctuation. Beginning in the late 1990s, PADEP listed several segments of the Wissahickon, and a number of other creeks, as nutrient impaired and subsequently set out to demonstrate a significant statistical correlation between phosphorus levels and periphyton growth and/or invertebrate impairment. At the time of the 2003 Wissahickon TMDL, EPA indicated that such correlations were not sufficiently established, and proceeded to base the final TMDL on Phosphorus reductions that would achieve compliance with DEP water quality standards for dissolved oxygen.

PADEP subsequently continued to pursue establishment of statistical correlations, while frequently representing that promulgation of numerical nutrient criteria was imminent. Proposed TMDLs for Skippack and Neshaminy Creeks, and a draft proposal for the Wissahickon Creek were issued, based on such ostensible correlations. However, all three were ultimately withdrawn without any clear indication of how nutrient issues would be resolved.

Now we are seeing TMDLs calling for a Phosphorus standard of 0.04 mg/l that is based on a "weight of evidence" approach. This TMDL appears to reflect abandonment of the need to demonstrate statistical correlation between nutrients and algae, in favor of a new "conditional probability" approach. UGT has not had the opportunity to independently evaluate this new approach in detail. Nevertheless we do not find the limited documentation in the TMDLs to be particularly convincing.

Moreover, the conclusions reached regarding the impact of phosphorus on invertebrate population and nutrient levels necessary to prevent such impact, seem highly questionable, oversimplified, and not scientifically justified.

In light of the significant nutrient reduction being sought pursuant to this TMDL, and the substantial costs associated with installing advanced nutrient treatment, particularly for publicly owned treatment works, it behooves EPA to put forth a more supportable basis for imposing such low levels on phosphorus discharge. Such a supportable basis would necessarily include a more comprehensive analysis of potentially causative factors, such as habitat impairment.

2. If EPA decides to finalize a nutrient TMDL at this time, it should focus on Phosphorus only[1], rather than simultaneous limits for P and N.

A. The draft TMDL notice references only phosphorus, and yet both phosphorus and nitrogen are referenced in the draft TMDL document. Proposed limits for both phosphorus and nitrogen are included. USEPA stated at a June 10, 2015 public meeting that a nitrogen TMDL limit will not be issued as part of this TMDL process.

B. Nitrogen is specifically referenced in the draft TMDL as not being the limiting nutrient for algae growth and stream impairment. Any linkage between nitrogen loading and periphyton densities is not established. There is no justifiable scientific evidence or basis that a nitrogen TMDL would achieve USEPA's water quality goals. Therefore, nitrogen should be specifically and definitely removed from the May 20, 2015 draft TMDL.

3. Facilities seeking to increase design capacity should not be capped at existing loads.

A. USEPA stated at the June 10, 2015 public meeting that in the event that a facility seeks to expand or increase its design capacity, they should be capped at their existing load, consistent with the current design flow within that relevant category.

B. While this approach may be appropriate for load allocations prepared for a lake or a bay, it is inappropriate for free flowing streams, particularly where the stream is effluent dominated, which is the case for the Wissahickon Creek, particularly during the growing season. Increased flow from a WWTP will increase the flow in the stream, which will increase the assimilative capacity of the stream. Increased flow from a WWTP does not presumptively necessitate a reduction in nutrient concentration, and could actually facilitate an increase in the allocation to other point sources. Such a cap would also unnecessarily have a significant negative impact on economic growth in the entire Wissahickon Creek drainage area.

4. The treatment technology necessary to achieve consistent, effluent Phosphorus levels of 0.04 mg/l has not been demonstrated in wastewater treatment plants, and would impose exorbitant costs on taxpayers.

A. In addition to our concerns that the need for such strict nutrient standards is not well documented and not scientifically supported, we also wish to remind USEPA of the implementation realities of what is being proposed. We know of no wastewater treatment facility that has successfully achieved compliance with a phosphorus standard of 0.04 mg/l. There is no documentation of any kind in the draft TMDL that such a strict phosphorus limit has been achieved or can be achieved. We have asked USEPA on several occasions (the most recent being at

[1] It is our understanding based on statements made by USEPA at the June 10, 2015 public meeting that USEPA will be withdrawing limitations on Nitrogen as part of this TMDL, in which case, we would strongly support that decision.

the June 10, 2015 public meeting) to provide a list of facilities achieving compliance with a 0.04 mg/l phosphorus limit. USEPA was not able to provide the name or location of any such a facility at the June 10, 2015 public meeting, but said they would look into it and get back to us. At the time of submittal of these comments, EPA had still not provided the requested information. Until USEPA provides a list of other facilities that have achieved successful compliance with a phosphorus limit of 0.04 mg/l, it is very difficult to provide more comprehensive and informed comments.

B. Although not specifically included in this May 2015 draft TMDL, a previous 2008 draft TMDL issued by the USEPA stated that construction of two-stage filtration plus additional treatment steps would be required to get anywhere near the 0.04 mg/l proposed TMDL for phosphorus. The 2008 draft TMDL stated that two stages of chemical addition and filtration, biological treatment, and UF membrane systems would be required to get ..."as low as 0.05 mg/l".

C. Please note that achieving consistent compliance with a 0.04 mg/l permit limit means that the target treatment level would have to be significantly lower than 0.04 mg/l. Any treatment process submitted for a Part II Construction Permit requires a margin of safety. Even EPA's Treatability Report in the draft 2008 TMDL casts considerable doubt, even with such complex, extraordinary, and costly treatment stated in the Treatability Report, on the ability to achieve consistent compliance, as would be required, with such a low phosphorus TMDL.

D. It is therefore reasonable to state that the efforts to design and construct such technology, as well as the potentially exorbitant costs which will be borne by tax payers, is wholly unjustified. The cost for Upper Gywnedd Township alone would be at least $15,000,000 in capital costs with increased operating costs of $500,000 to $1,000,000 annually. These costs would represent the best available technology for phosphorus and would not achieve compliance with a permit limit of 0.04 mg/l phosphorus. We would also state that USEPA typically grossly underestimates the cost to construct such treatment facilities

5. <u>Phosphorus treatment to 0.04 mg/l would have a significant, adverse impact on the environment</u>

   A. Very significant quantities of chemicals would be needed to reduce phosphorus levels to even get in the range of 0.10 mg/l of phosphorus. The production of such chemicals requires energy usage which would significantly increase the carbon footprint associated with phosphorus treatment.
   B. The large quantities of chemicals would require much more frequent deliveries to maintain adequate chemical inventory. Here too, the carbon footprint associated with such delivery would be increased.

C. The larger quantities of chemicals used in the treatment process at a WWTP requires increased energy which, once again, increases the carbon footprint of trying to meet such an unrealistic TMDL.

D. Increased truck traffic, particularly on small, local roads, would increase the safety risk to the public through an accident or spill.

E. Higher levels of chemical addition would result in higher levels of residual chemicals into the Wissahickon Creek. These chemicals would adversely impact the health of the creek, which would undermine the stated purpose of the draft TMDL.

F. Chemical addition to achieve lower levels of phosphorus will result in additional sludge generation. This will result in increased landfill usage, more truck traffic for sludge hauling, an increased carbon footprint from the increased truck traffic, and an increase in safety risk from the increased truck traffic on small, local roads.

6. Increased chemical usage would likely result in the need for treatment of residual chemicals

Typical chemicals used for phosphorus treatment include metals salts, such as iron and aluminum. The levels of chemicals needed to reduce phosphorus levels would surely increase the residual levels of metals going to the Wissahickon Creek. From previous experience, the higher levels of metals would likely result in effluent standards for metals to meet Pennsylvania Water Quality Standards. This will, in turn, result in the need for extensive and very costly treatment for such residual metals. This will only compound the exorbitant costs to rate payers.

7. The EPA has not provided the models and raw data and information requested and needed for a thorough TMDL review.

At the June 10, 2015 public meeting EPA was asked about the raw data, information, and models used in the TMDL development. EPA said they would provide the data, information, and models used in developing the draft TMDL. It is very difficult to make fully informed comments when data and information used in the TMDL development process is not made available. At the time of submittal of these comments, EPA had not provided the requested data, information, and models necessary to properly comment on the draft TMDL.

8. The theoretical quantitation limits for phosphorus is greater than the draft TMDL limit for phosphorus

A. The draft TMDL is for a phosphorus limit of 0.04 mg/l. In addition to all of the other comments presented herein, it is unrealistic, scientifically indefensible, and impractical to propose a limit that cannot be accurately

analyzed. The practical quantitation limit for phosphorus is 0.05 mg/l. How would it be known if a WWTP was achieving compliance with a 0.04 mg/l limit when the analytical method cannot accurately quantify such low levels? In addition, permit compliance requires that the analytical detection limit be less than or equal to the permit limit.

B. We also note that, based on the draft TMDL, the phosphorus limit for Upper Gwynedd Township could be less than 0.04 mg/l. This means that Upper Gwynedd Township would have to design for a phosphorus discharge limit potentially, significantly less than 0.04 mg/l. This would further reinforce the impractical and scientific infeasibility of accurately detecting phosphorus levels of 0.04 mg/l, or less.

9. USEPA doesn't know that a phosphorus TMDL of 0.04 mg/l will achieve the stated water quality objectives

A. USEPA has been asked on several occasions, most recently at the June 10, 2015 public meeting, about the ability of a phosphorus TMDL of 0.04 mg/l to achieve its water quality objectives. The stated EPA water quality objective is to provide in stream water quality that is protective of aquatic life uses. EPA is not sure that the water quality objectives will be achieved with a 0.04 mg/l TMDL for phosphorus. Therefore, USEPA is proposing a TMDL that will be exorbitantly and prohibitively expensive, does not have a treatment technology which can meet such a limit, is not scientifically justified, and for which there is much uncertainty as to whether the water quality objectives desired will even be achieved.

B. EPA was asked at the June 10, 2015 public meeting if they know of treatment facilities or locations where a discharge limit of 0.04 mg/l phosphorus was achieved and the water quality objectives were achieved. EPA did not know of any but said they would look into it and get back to us. At the time of submitting these comments no such information has been provided.

10. The data and information used by USEPA in the draft TMDL is mostly out of date and does not reflect current conditions

A. The data that is used in the draft TMDL is generally very dated. Much of it goes back more than five years. As such it does not reflect the fact that phosphorus treatment was installed at the Upper Gwynedd Township WWTP in 2009. There are literally hundreds of references and uses of data which pre-date the chemical feed treatment installed by Upper Gwynedd. In fact, there are even references and uses of data which pre-date the year 2000. Reference is made to the report dated February 23, 2012 prepared by Tetra Tech included in the draft TMDL, "Evaluation of Nutrients as a Stressor of

Aquatic Life in Wissahickon Creek, PA". Page 18, bottom paragraph references algae sampling performed by PADEP in 1998; Page 19, Prediction 4, Paragraph 2 references diatom data collected in 1998; Pages 35 and 36, Table 2, reference data locations most recently sampled in 1970, 1976, 1979, and 1999. Using data and information which dates back as far as 1970 is scientifically specious and indefensible.

B. The draft TMDL also references the "North Wales Water Authority (NWWA) WWTP". This WWTP was taken out of service in 2013. The NWWA WWTP now discharges to the Upper Gwynedd WWTP. Reference is made to the draft report dated May 2015, "Total Phosphorus TMDL for the Wissahickon Creek, Pennsylvania" where the NWWA WWTP is referenced numerous times. These references include Table E-1; Page 2, Section 1.1; Page 27, Section 2.5, Table 2-12; Page 30, Section 3.1.1; Page 31, Table 3-1; Page 44, Section 4.1.4; Page 59, Section 5.1; Page 60, Table 5-1; Page 63, Section 5.2.2; Page 70, Table 5-6; Pages 73-86, Tables 5-7 to 5-20; The draft TMDL should be corrected to reflect the fact that the NWWA WWTP no longer exists and re-issued with a revised analysis of the impact to the Wissahickon Creek.

11. The TMDL limit of 0.04 mg/l phosphorus will not achieve the water quality goal

A. Even if the WWTPs in the drainage area discharged zero phosphorus (which of course is not feasible), the water quality goal of 0.04 mg/l in the Wissahickon Creek would not be achieved. Runoff from agricultural lands, animal droppings, septic systems, runoff from storm events, and related causes would keep stream levels of phosphorus above the draft TMDL limit of 0.04 mg/l. We see nothing in the draft TMDL that directly addresses this issue.

TMDL COMMENTS FOR STORMWATER DISCHARGE

Comment 1

Ortho-Phosphorous

It is not immediately clear how (or if) ortho-phosphorus (OP) is calculated in the current model run. Assuming it is, what percentage of total phosphorous is made up by OP? Based on a previous question asked in a recent EPA meeting, it was indicated with certainty that some the OP found fate within periphyton, though there was less certainty regarding if root uptake by plants (and immobilization by microbes) accounted for any capture of OP. As absorbance by plants roots is a common fate of OP (as well as consumption by microbes), please provide documentation of the

steps, biotic factors, math and initial assumptions involved with calculating what amount of total phosphorous becomes ortho- phosphorus through mineralization and immobilization by microbes (bacteria).

Comment 2

Dissolved Organic Carbon

Based on the report, it is not immediately apparent how the model takes into account the benefit of dissolved organic carbon (DOC) to the ecosystem. The presence of plant material, particularly trees, foster the availability of DOC. DOC is a key component in the support of phosphate solubilizing bacteria (PSBs) that, when available, may mineralize phosphorous and convert it into ortho-phosphorus (plant available phosphorous). In addition microbes (bacteria) may consume ortho-phosphorus (immobilization). Without an indication of if the model takes into account any variation in abundance of PSBs in direct proportionality with available DOC, it is unclear if proper credit is being given to portions of the Wissahickon that are abundant with wetlands, meadows or forest and their effectiveness as nutrient sinks (P, N).

If a relationship of DOC to microbial growth and subsequent increase in mineralization, immobilization and plant capture of TP is taken into account in the EFDC model, please provide a detailed description of processes, including equations and initial assumptions.

Comment 3

Model Appropriateness

Based on review of the report and documentation on the USACE website. It appears there has been a bias towards the development of this model for coastal and estuarine applications where Nitrogen tends to be the limiting agent with regards to algal growth in brackish waters. With regards to fresh water, phosphorous tends to be limiting agent to algal growth. Where the biochemical processes can vary in comparison to brackish and coastal waters, how extensively has this model been used in solely freshwater applications?

Comment 4

MS4 Sewer Sheds

Understandably, the modelers did not have access to the sewer shed boundaries, which would identify the extent of land use area that would be the actual responsibility of the municipal entities of the Wissahickon. Consequently, as is common with TMDL reports the entire wasteload allocation (WLA) is attributed to the municipal entity with deference to the municipal entity to "parse out" portions of the WLA number that would be attributed to the load allocation regions (LA).

Based on the remarkably high reduction amounts calculated by this study it is suggested that EPA request locations of all outfalls, inlets, and if available, sewer shed boundaries from all municipalities so that the large portions of lands which they are not accountable for, can be "parsed" out. It is theorized that this will provide a more realistic, and thus, more attainable reduction figure for many communities. Taking into account that one of the largest contributors to the phosphorous wasteload are farms (highest unit loading factor), many of which contribute runoff into gullies that connect directly into tributaries (and not the MS4 storm sewer), removal of farms from the responsibility of the municipal entities could, alone, provide a notable reduction of assigned phosphorus wasteload for a number of communities.

If communities do not have a sewer shed boundary, providing a geo-referenced location of inlets and outfalls will provide enough information for a rough sewer shed to be developed through a GIS tool such as Arc Hydro, which can auto-delineate drainage divide boundaries. It is believed that this work can provide for a more beneficial and attainable approximation of wasteload reductions required by the individual municipalities.

Comment 5

Maximum Extent Practicable

Based on model runs performed internally by Upper Gwynedd support staff, using AVGWLF (now MAPSHED), in the most extreme case where weekly street sweeping would be performed year round, all streams would be restored, 100 foot riparian buffers added along all streams as well as every acre of tributary area captured by a combination of bioretention and constructed wetlands. The maximum reduction level that can be achieved is 61.2%, far from the 96.2% goal listed in the report.

The unspoken conclusion of this report (if all numbers were final) would be, the Wissahickon cannot attain its designated use.

In cases such as these, there are a variety of strategies that could be looked at. One such approach is already a subject of discussion, an alternative TMDL approach which would fit the *Adaptive Management* model approach.

Another approach might be to employ a *Use Attainability Analysis (UAA)* to study and ascertain if a change in designated used for the stream is required, whereby a higher nutrient endpoint may be used.

In the past, where unattainable values have been calculated, a lower, *interim target* has been used, such as was the case in South Carolina's Savannah Harbor TMDL. In the conclusion of this example, instead of the unattainably high value assigned, Georgia and South Carolina were required to achieve a 30% reduction - a much more attainable goal.

On behalf of the Upper Gwynedd Township Board of Commissioners,

Leonard T. Perrone
Township Manager

cc via email: Board of Commissioners
John Interrante, P.E.
John Hall, Esquire
WWTP TMDL Group