

APPENDIX M. PUBLIC INFORMATIONAL HEARING COMMENTS

Below is a copy of the comments received during the public informational hearing comment period which ran from November 30, 2018 through January 18, 2019. All comments received during the comment period are included below. A copy of the comments and the Department's responses is included in Appendix N.

Comment submitted via e-mail:

Hello Keith and Kevin,

We have a question on the Appendix K Table 1 adaptive management phosphorus targets and we thought it would be best to email you about it. Please don't consider this a formal comment at this point. We understand the point of standards (target) application is the surface water at the outlet of the subbasin. Almost all of the targets are well below associated surface water quality criteria - both the local and the downstream criteria. Can you explain why that would be the case? The appendix K text indicates low targets may reflect the lack of nonpoint sources and other controllable sources in the subbasin; however, the targets are low even where there is significant nonpoint contribution. And in any case, we don't understand why presence or absence of NPS in the subbasin would affect the AM target concentration in the surface water at the outlet of the subbasin. Why would the target concentration be less than 40 ug/L in any subbasin? In particular, Fond du Lac's AM target is 32 ug/L yet the Lake Winnebago criterion is 40 ug/L, and Fond du Lac discharges directly to the lake.

Thanks in advance for explaining this. We do appreciate the inclusion of a table such as this to help dischargers evaluate compliance options.

Jane



Jane Carlson, P.E., ENV SP | Senior Associate

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January 18, 2019

VIA EMAIL

Keith Marquardt
Wisconsin Department of Natural Resources
625 E County Road Y, Suite 700
Oshkosh, WI 54901

RE: Comments of the Municipal Environmental Group – Wastewater Division on the
Upper Fox and Wolf River TMDL Report

Dear Mr. Marquardt:

We are submitting these comments on the Wisconsin Department of Natural Resources' (DNR) Total Maximum Daily Load (TMDL) Report for Total Phosphorus in the Upper Fox and Wolf River Basin on behalf of the Municipal Environmental Group–Wastewater Division (MEG). MEG is an organization of approximately 100 municipalities statewide who own and operate wastewater treatment plants. MEG has a long history of supporting efforts to remove phosphorus from our state's waters. We greatly appreciate the opportunity to submit comments on the TMDL report.

1. Nonpoint Source Pollution

Wisconsin was a leader in establishing technology-based effluent limits on phosphorus back in 1992 at 1.0 mg/L. As a result, Wisconsin municipal treatment plants have already removed approximately 90% of the phosphorus in their discharges. It is thus not surprising that most of the phosphorus impairments in Wisconsin's waters do not come from municipal treatment plants, but from nonpoint sources.

The TMDL seeks to impose extremely restrictive limits on point source dischargers, despite the fact that baseline phosphorus loadings in the Upper Fox and Wolf River TMDL area are dominated by nonpoint sources. Because point sources have already removed a substantial amount of phosphorus from their discharges, reducing phosphorus discharges from point sources to the level proposed in the TMDL will not result in meaningful water quality

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improvement. Scenarios modeled by USGS in 2016 showed only a 2% reduction in Lake Winnebago total phosphorus (TP) concentrations even if WWTP loadings were set to zero. This reduction may not even be measurable.

The Draft TMDL Report discusses reasonable assurances for reduction of phosphorus from nonpoint sources. Such efforts have, however, been historically ineffective. MEG requests that DNR provide further explanation as to how TMDL implementation will achieve the proposed reductions in nonpoint source phosphorus pollution.

2. Attainability

The paleoecological study results suggest that the TP concentration in Lake Winnebago was at or above the water quality criterion of 40 ug/L prior to anthropogenic development in the area (1310-1725). The dams at the outlet to Lake Winnebago were constructed after that time, resulting in a raising of the water level. This caused increased shoreline erosion and lake area and likely reductions in groundwater inputs to the lake. Further, additional agricultural, urban, and other development occurred after that time and prior to the enactment of the Clean Water Act. There is significant in-lake recycling and internal loading of TP occurring now, and modeling indicates it will take the better part of a century to reduce the internal loading to an acceptable level after external loadings are reduced. All of these factors suggest that the 40 ug/L criterion is not attainable. It is unacceptable to require point sources to comply with the proposed stringent TP wasteload allocations now or in the future when the criterion is unattainable.

3. Phased TMDL Implementation

MEG requests that DNR strongly consider and provide additional information on a phased TMDL implementation. This is particularly necessary for this TMDL area, where there is such significant uncertainty that the water quality criterion is appropriate and attainable. A phased TMDL would provide additional time to study and revise the criteria if appropriate, without locking permittees into stringent wasteload allocations that could be subject to antibacksliding restrictions.

A phased TMDL would also allow for achievement of interim milestones and waste load allocations while allowing time for achieving important nonpoint source reductions. A phased implementation process could include initial load reductions followed by monitoring and modeling and resulting modifications to the TMDL allocations. Without a phased approach, point sources will be forced to meet final allocations over a short timeframe as compared to

nonpoint sources. And, as discussed above, reductions from such allocations will not result meaningful water quality improvements.

The authority to implement a phased TMDL approach exists under the Clean Water Act. The U.S. EPA has issued several guidance documents that discuss the permissible use of phased or staged TMDLs. See *Guidance for Water Quality-Based Decisions: The TMDL Process*, Environmental Protection Agency (1994); *Memorandum: Clarification Regarding "Phased" Total Maximum Daily Loads*, Environmental Protection Agency (2006). MEG requests that DNR provide further evaluation of a phased approach to the Upper Fox and Wolf River TMDL.

4. Site Specific Criteria

MEG recommends that the DNR reconsider appropriate and attainable site specific criteria (SSC) for the pool lakes, including Lake Winnebago. The sediment core results, TP criteria from Minnesota (on which the Wisconsin lake and reservoir criteria were based), and this TMDL effort all suggest that a higher TP criterion could be justified. In addition, MEG questions the validity of applying a chlorophyll α threshold from Minnesota, which was developed based on public perception of water quality in lakes, to water quality in Lake Winnebago. A phased TMDL as discussed above could be implemented initially to allow time for SSC development that would implement more appropriate phosphorus criteria.

5. Development of Allocations

MEG requests that DNR consider alternative allocation scenarios. For example, DNR should run scenarios to determine whether different allocation methods could be more cost-effective than the proportional approach used in other Wisconsin TMDLs. For this TMDL, where only a small percentage of loadings are from WWTPs and MS4s, DNR should run a scenario where all WWTPs are set at a less restrictive TP limit, such as 0.5 mg/L, at design average flow and all MS4s to the TP-equivalent of a 40% TSS reduction to determine whether this methodology would change the required nonpoint source load allocations significantly.

6. Compliance Options

With municipal dischargers potentially facing extremely stringent TMDL based limits, it is important that there be a number of viable compliance options available to dischargers. Unfortunately, using current DNR trading guidance, this TMDL will result in a credit threshold so low that long-term credits will be essentially impossible for permittees to obtain. The costs associated with interim credits make trading a much less viable option for permittees.

January 18, 2019

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DNR should reevaluate restrictions on trading and adaptive management in order to provide more flexible compliance options for point sources. Without such flexibility, municipal dischargers are likely to face substantial costs for facility upgrades well into the future that will not result in meaningful water quality improvement.

Sincerely,

STAFFORD ROSENBAUM LLP

A handwritten signature in black ink, appearing to read "Paul G. Kent". The signature is written in a cursive, flowing style.

Paul G. Kent

Vanessa D. Wishart

PGK/VDW:mai



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January 16, 2019

Mr. Keith A. Marquardt
Wisconsin Department of Natural Resources
626 East County Road Y, Suite 700
Oshkosh, WI 54901

Re: Draft Upper Fox and Wolf Total Maximum Daily Load (TMDL) Report Comments

Dear Mr. Marquardt:


Thank you for the opportunity to comment on the November 30, 2018, draft TMDL Report for the Upper Fox and Wolf Basins. The following comments are respectfully submitted on behalf of the Silver Lake Sanitary District (SLSD) and its rate payers.

The White River upstream of the SLSD Publicly Owned Treatment Works (POTW) discharge has a May-to-October total phosphorus (TP) concentration of 0.021 milligrams per liter (mg/L), which is below the 0.075 mg/L criterion. In the Water Quality-Based Effluent Limitations for SLSD Memorandum dated February 23, 2017, the Wisconsin Department of Natural Resources (WDNR) calculated a water quality-based phosphorus effluent limit of 2.11 mg/L for the SLSD POTW and stated this number is far in excess of the technology-based limit of 1 mg/L from Chapter NR 217, which was already in the SLSD POTW discharge permit. This memorandum stated no water quality-based limit for phosphorus was needed at the time.

Compared to the phosphorus loadings from the SLSD POTW and other POTWs, agricultural and background nonpoint sources contribute significantly higher phosphorus loadings to the Wolf River watershed. As the phosphorus loadings from agriculture and background sources far exceeds the phosphorus loadings from the SLSD POTW and other POTWs, we request the 1 mg/L technology-based limit remain in effect until measures are taken by the nonpoint source contributors to reduce their loadings. If this is not acceptable, we request the TMDL-based limits be implemented such that stepwise reductions taken by SLSD POTW and other point source dischargers are matched by nonpoint source reductions. We request the TMDL-based effluent limits for SLSD be implemented with interim limits in a phased approach over several permit terms to reduce the financial burden on SLSD rate payers.

Sincerely,

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Glenn W. Tranowski, P.E.

c: Joel Jodarski, Silver Lake Sanitary District

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City of Clintonville Wisconsin 54929

January 16, 2019

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Mr. Keith A. Marquardt
Wisconsin Department of Natural Resources
625 East County Road Y, Suite 700
Oshkosh, WI 54901

Re: Draft Upper Fox and Wolf Total Maximum Daily Load (TMDL) Report Comments

Dear Mr. Marquardt:

This letter provides the City of Clintonville's (City's) comments on the November 30, 2018 Public Hearing Draft TMDL Report for the Upper Fox and Wolf Basins.

1. As indicated in the Wisconsin Department of Natural Resources' (WDNR's) Fiscal Year 2020 environmental loan documentation, the City's median household income (MHI) is \$36,064, or approximately 66% of the statewide MHI. The City recently invested over \$11 million in its Wastewater Treatment Plant (WWTP) to improve effluent quality, including improvements to reduce effluent phosphorus to below 0.5 mg/L to meet a newly-imposed NR217-based water quality based effluent limit (WQBEL). The Draft TMDL Report indicates that we will receive an even lower mass limit (equivalent to 0.2 mg/L) that is not achievable with the existing WWTP alone. We are concerned about the additional cost to our ratepayers given that we just incurred significant costs for plant improvements and have recently had three significant rate increases.
2. The City does not have many viable phosphorus compliance options aside from more capital improvements to the WWTP which are anticipated to cost approximately \$3.5 million and increase operation and maintenance costs by about \$150,000 annually (based on published compliance costs from the Wisconsin Department of Administration and the Wisconsin Municipal Environmental Group Wastewater Division). While water quality trading (WQT), adaptive management (AM), and the multi-discharger variance for phosphorus (MDV) are currently available compliance options, none of them will likely be viable for the City.

Because of the TMDL the credit thresholds for WQT will result in almost all trades being good for one permit term only, making the City constantly searching for more trades and resulting in high costs in the long term. In addition, trade ratios, nutrient management plan requirements, and other guidelines for implementing trades are burdensome. Eliminating or relaxing the credit thresholds and making

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WQT easier to administer would make it a more attractive compliance option and result in non-point source load reductions.

Appendix K of the report indicates an AM target for the Clintonville WWTP of 29 ug/L. It is not clear why this target is even lower than the phosphorus criteria for downstream lakes. We do not believe this is attainable and therefore do not believe AM is a feasible option.

The City is likely eligible for the MDV but it is only approved through 2027, limiting the City's ability to use this relatively low-cost compliance option that would result in the implementation of non-point source best management practices.

3. The Draft TMDL report indicates that the City's contribution to the "baseline" phosphorus load is only 0.2 percent (based on our calculations) and the combined phosphorus contribution of all point sources is 19%, while agriculture contributes over three times as much at 60%. However, almost all of the cost for implementing this TMDL will be borne by ratepayers for the point sources. The TMDL should focus more on realistic ways to reduce nonpoint source contributions rather than further reducing the relatively small contribution from WWTPs, most of which (including the Clintonville WWTP) already remove over 90% of the phosphorus from their influent.
4. The response to comments in Appendix L of the report states that "the confidence interval of the paleoecological study results show that historic Lake Winnebago concentrations may have been below 40 ug/L" and gives an overall confidence interval of 32 to 59 ug/L. It seems that this confidence interval could also be used to conclude that the historic Lake Winnebago concentrations were above 40 ug/L, making the 40 ug/L standard being used for this TMDL lower than the lake concentration prior to development in the area. We do not believe that it is feasible for the Lake Winnebago TP concentration to be reduced to 40 ug/L given the historic concentrations reported.
5. According to NR 217, TMDL-based limits can be used in WPDES permits for two or three permit terms if nonpoint source loads have been substantially reduced. Since there is no requirement for nonpoint sources to reduce their loadings, we are concerned that limits on point sources could be reduced further after two or three permit terms. Please provide additional information on how the nonpoint source reductions (including Lake Winnebago vegetation restoration) indicated will be accomplished including who will pay for these reductions. We feel that this TMDL is an unfunded mandate on point sources and do not believe it is fair or appropriate for our ratepayers to have to fund nonpoint source reductions, either directly through watershed compliance options or through more stringent future limits if nonpoint sources do not reduce their loadings. Please provide assurance that point sources will not be imposed with more stringent limits if nonpoint sources do not reduce their loadings.

Sincerely,



Administrator,
City of Clintonville

**RICHMOND SANITARY DISTRICT NO. 1
P. O. BOX 491
SHAWANO, WI 54166
(715)526-2592**

January 9, 2018

Wisconsin Department of Natural Resources
ATTN: Keith Marquardt
625 E County Road Y
Suite 700
Oshkosh, WI 54901-9731

RE: Public Comment

Mr. Marquardt:

The Richmond Sanitary District is part-owner of the Wolf Treatment Plant based in Shawano, Wisconsin.

It is our understanding that the Wisconsin Department of Natural Resources is once again considering lowering the phosphorous limits on effluent for the Treatment Plant.

Our concern is that by doing so, this will, in the end, result in higher user fees for all of the sewer users in the District. The treatment plants are only responsible for 8% of the total phosphorous that is flowing into the system. If you made the levels zero, it still would not solve the problem.

The costs of the upgrades to the plants is too excessive for the results. The sewer users in our District cannot afford it at this time.

Please reconsider your thoughts. Thank you.

RICHMOND SANITARY DISTRICT COMMISSION

Ricky Brockman, President
Jane Krueger, Secretary-Treasurer
Ross Beversdorf, Commissioner

JK
Cc: file



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January 17, 2019

Mr. Keith A. Marquardt
Wisconsin Department of Natural Resources
625 East County Road Y, Suite 700
Oshkosh, WI 54901

Re: Draft Upper Fox and Wolf Total Maximum Daily Load (TMDL) Report Comments

Dear Mr. Marquardt:

Thank you for this opportunity to comment on the November 30, 2018 Public Hearing Draft TMDL Report for the Upper Fox and Wolf Basins. These comments are submitted on behalf of the City of Green Lake (City). The City provided comments on August 3, 2018 (enclosed), which the City also incorporates into these comments by reference.

1. The Wisconsin Department of Natural Resources (WDNR) responded to the City's previous comment regarding eligibility for Adaptive Management (AM) as a compliance option, but it is not clear in the WDNR's response if wastewater treatment facility (WWTF) dischargers whose receiving streams are below the water quality criterion would be eligible for AM. The City reiterates its request that AM is made available to all WWTF dischargers that are requiring reductions based on downstream water quality, even if the local receiving stream is below its water quality criterion.
2. The City made a previous comment regarding the unlikely attainability of the 40 micrograms per liter ($\mu\text{g/L}$) standard for Lake Winnebago given the paleoecological study results that suggest that the total phosphorus (TP) concentration in Lake Winnebago was at or above the water quality criterion of 40 $\mu\text{g/L}$ prior to development in the area (1310 to 1725). In its response, the WDNR stated that the model results showing a pre-settlement concentration of 32 $\mu\text{g/L}$ falls within the confidence interval of the paleoecological data. Given the range of the confidence interval stated (32 $\mu\text{g/L}$ to 59 $\mu\text{g/L}$), it appears that the paleoecological data would also support a pre-settlement concentration of 59 $\mu\text{g/L}$ just as it is being used to support a concentration of 32 $\mu\text{g/L}$. While the low end of this confidence interval matches WDNR's pre-settlement lake model prediction, the modeling is based on an assumed pre-settlement tributary stream concentration that could be inaccurate. The City reiterates its previous comment that it does not believe that the 40 $\mu\text{g/L}$ criterion is attainable. The TMDL should be based on attainable targets, especially considering the significant financial burden this TMDL will have on municipalities.
3. The report states that an 83 percent reduction of all controllable sources of phosphorus is required for Lake Winnebago to meet the water quality standards. It also states that point source dischargers currently combine for 19 percent of the TP load while nonpoint sources such as agriculture contribute over 60 percent. The Green Lake WWTF only contributes 0.2 percent of the baseline phosphorus load. Because the nonpoint sources will not be required to reduce their phosphorus contribution as part of this TMDL, the City is concerned

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Mr. Keith A. Marquardt
Wisconsin Department of Natural Resources
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that the nonpoint source reductions indicated will not be realized and that limits on point sources will be reduced further after two or three permits terms. This will put an even larger financial burden on municipalities in the future, many of which will have to spend a significant amount to comply with the limits indicated in this TMDL. The WDNR should develop a plan to require rural nonpoint sources to reduce their loadings, and implement that plan before imposing stringent limits on municipalities.

Sincerely,

STRAND ASSOCIATES, INC.®



Nicholas A. Bartolero, P.E.

Enclosure

c: Glen McCarty, City of Green Lake
Mayor Jon McConnell, City of Green Lake
Jane Carlson, P.E. ENV SP, Strand Associates, Inc.®

Note: The letter dated August 3, 2018 was resubmitted as part of the public hearing comment period.



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August 3, 2018

Mr. Keith A. Marquardt
Wisconsin Department of Natural Resources
625 East County Road Y, Suite 700
Oshkosh, WI 54901

Re: Draft Upper Fox and Wolf Total Maximum Daily Load (TMDL) Report Comments

Dear Mr. Marquardt:

Thank you for this opportunity to comment on the July 2018 draft TMDL Report. These comments are submitted on behalf of the City of Green Lake (City). The City is concerned about the cost impact of the TMDL, and especially on its wastewater treatment facility (WWTF). The WWTF already removes approximately 90 percent of the influent phosphorus, and the City has been evaluating options for meeting lower NR 217.13 limits. This TMDL would result in even more stringent limits and much higher compliance costs, and we estimate the City contributes well under 1 percent of the phosphorus loading to Lake Winnebago.

1. The Draft TMDL Subbasin Map depicts a subdivision of subbasin 25 between South Lawson Drive and the dam at North Lawson Drive that includes areas that drain to Green Lake directly or through the City's storm sewer system. We request that the subdivision of subbasin 25 between South Lawson Drive and the dam at North Lawson Drive be combined with subbasin 20 based on natural drainage area, hydrologic regimes, and land use patterns. The land use upstream of the dam at North Lawson Drive is similar to that in subbasin 20, while the land use downstream of North Lawson Drive is almost completely agriculture, forest, or wetlands. Including the entire drainage area for Green Lake in subbasin 20 is consistent with the subbasin delineations for the rest of the TMDL.
2. Appendix D of the draft TMDL report indicates that Green Lake has a loading capacity of 9,319 pounds of total phosphorus per year (lbs TP/yr) to achieve its total phosphorus (TP) criterion of 15 micrograms per liter (ug/L). The sum of the total loads from subbasins that are tributary to Green Lake (20, 17, 18, 19, 79, 83, and 87) is 6,618 lbs TP/yr. This suggests that Green Lake has excess loading capacity based on the upstream load reductions necessary for local water quality in the respective subbasins. Given the excess loading capacity available in Green Lake, please confirm that the lake outlet TP concentration used in the TMDL modeling is less than 15 ug/L when determining necessary downstream reductions, making this excess loading capacity available to downstream subbasins.
3. The draft TMDL Report indicates that the Green Lake WWTF requires a reduction in effluent TP partially based on local water quality. The TP concentration data presented in Table 6 of the draft TMDL Report indicates that the Puchyan River upstream of the dam at North Lawson Drive meets the water quality criterion. It appears that the current WWTF discharge is protective of the water quality in the river and no reduction based on local water quality should be required.

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Mr. Keith A. Marquardt
Wisconsin Department of Natural Resources
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August 3, 2018

4. Using adaptive management as a compliance alternative requires the receiving stream to be above its water quality criterion. This will not be the case for the Puchyan River. The TMDL results in stringent phosphorus limits for the Green Lake WWTF, and adaptive management may provide cost relief and environmental benefit. We request that adaptive management is made available as a compliance option for all WWTF dischargers that are requiring reductions based on downstream water quality. Please add appropriate language to the TMDL Report and subsequent Wisconsin Pollutant Discharge Elimination System (WPDES) permits to allow this.
5. Water quality trading with nonpoint sources as a long-term compliance option is onerous under current rules and guidelines, requiring credit thresholds, trade ratios, nutrient management plans for all land owned by the farmer regardless of location, and more, to provide multiple safety factors. This draft TMDL Report already incorporates implicit margins of safety. Therefore, could the agencies consider language in the TMDL Report that will provide some streamlining and relief from current Wisconsin water quality trading guidance? One example could be to not require a credit threshold for the macrophyte restoration, and to allow the credit in the trade ratio for this management practice, as would normally be allowed for an aquatic habitat improvement action.
6. The paleoecological study results suggest that the TP concentration in Lake Winnebago was at or above the water quality criterion of 40 ug/L prior to development in the area (1310 to 1725). Based on this data, we do not believe that the 40 ug/L criterion is appropriate or attainable, considering that this would require all phosphorus sources to be lower than the naturally occurring "background" sources from the 1300s. The Lower Fox River TMDL report noted that 40 ug/L is not likely attainable in Lake Winnebago. The agencies should use an attainable target for the phosphorus TMDL.
7. NR 217 indicates that TMDL-based limits can be used in WPDES permits for two or three permit terms if nonpoint source loads have been substantially reduced. How does the Wisconsin Department of Natural Resources (WDNR) anticipate that the high nonpoint source reductions identified are realized? Can the WDNR provide assurances to point sources that further reduction will not be demanded of point sources if the nonpoint source reduction is not met in the 20-year planning period used by most publicly owned treatment works (POTWs)? Please provide language in the TMDL or in a revision to NR 217, and in subsequent WPDES permits, clarifying that the TMDL-based limits will not decrease in the future, for at least 20 years.

Sincerely,

STRAND ASSOCIATES, INC.®



Nicholas A. Bartolerio, P.E.

c: Glen McCarty, City of Green Lake
Mayor Jon McConnell, City of Green Lake
Jane Carlson, P.E. ENV SP, Strand Associates, Inc.®



Wolf Treatment Plant

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Thank you for this opportunity to comment on the November 30, 2018 draft TMDL Report for the Upper Fox and Wolf Basins. These comments are submitted on behalf of the Wolf Treatment Plant located in Shawano, WI.

1. The paleoecological study results suggest that the TP concentration in Lake Winnebago was at or above the water quality criteria of 40 ug/L prior to settlement in the area (1310-1725). Based on this data we do not believe that the 40 ug/L criteria is appropriate or attainable, considering that this would require all phosphorus sources to be lower than the naturally occurring "background" sources from the 1300s. Confidence interval indicated for this data was not presented in the paleoecological study report and appears to have been selected to match the modeling results. The DNR used the lowest value in the confidence interval to indicate that the lake model was accurate. We do not believe that using the lowest number in the confidence interval is appropriate considering the range of values.
2. As discussed above, the DNR is proposing to require reductions that will bring the Lake Winnebago TP concentration to below the presettlement "background" conditions yet the TMDL states that background loads are not controllable and no reductions in background sources are possible. How can the loads to Lake Winnebago be reduced to below presettlement "background" conditions if background loads cannot be reduced? It appears that this suggests that converting forests and wetlands to urban areas and treating the stormwater and wastewater from these areas would reduce loads from "background" sources.
3. The phosphorus load from individual permits in the Wolf River watershed is less than the load from background sources and 1/6 of the load from agricultural sources yet almost all of the financial burden for load reductions will be borne by POTWs such as the Wolf Treatment Plant. We request an implementation approach that requires stepwise point source reductions that are matched by nonpoint source reductions, especially for POTWs that are discharging to streams that are not impaired.
4. Based on the relatively small TP loading from point sources, further reductions from these sources without nonpoint source reductions will not result in significant water quality improvement. We request that the DNR quantify the impact on water quality from the proposed point source reductions without nonpoint source reductions.
5. The recently published Adaptive Management (AM) target in-stream phosphorus concentration of 29 ug/L for the Wolf Treatment Plant is a very low and likely not attainable. Use of this target phosphorus concentration will reduce the likelihood that AM could be successfully implemented and as a result it reduces the compliance options available to the Wolf Treatment Plant.



Wolf Treatment Plant

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6. The TMDL notes that it may take more than 70 years to reach the TMDL targets. It appears that this assumes that all necessary reductions occur immediately. Please clarify the assumptions that are included in this estimate as we are unaware of any requirements that would hold agriculture and other larger contributors accountable for their share of necessary reductions. Please provide a realistic timeline considering required compliance of all point and non-point sources.

7. NR 217 indicates that TMDL-based limits can be used in WPDES permits for two or three permit terms if nonpoint source loads have been substantially reduced. How does the DNR anticipate that the high nonpoint source reduction identified are realized? Can the DNR provide assurances to point sources that further reduction will not be demanded of point sources if the nonpoint source reduction is not met in the 20-year planning period used by most POTWs?

Thank you for your consideration.

Jerry Weisnicht
Administrator
Wolf Treatment Plant
Shawano Lake Sanitary District

Also signed in agreement by the following:

Ed Zeitler
Commissioner
Shawano Lake Sanitary District

Todd Lorbiecki
Director of Municipal Operations
Village of Bonduel

Ed Whealon
Mayor
City of Shawano

Eric Thomas
Village President
Village of Cecil

Eddie Sheppard
Administrator
City of Shawano

Ricky Brockman
Chairman
Richmond Sanitary District

Submitted Via E-mail:

Mr. Marquardt,

I am a new resident to WI and live on Lake Winnebago (FDL Co).

It is clear that a great deal of effort went into the TMDL Draft Report, and as an area resident, it goes without saying how concerned we should all be regarding the health of our water. I read the draft report, didn't comprehend a great deal of the technical part of it, but it's glaringly apparent that the Fox-Wolf Watershed is in trouble.

Despite the monumental effort the WDNR has put into this report, the concern is that the pollution will continue without addressing the phosphorous pollution coming agricultural operations, which includes the willy-nilly spreading of manure without NMPs. Fond du Lac County has over 200,000 acres of agricultural lands; however, they have been lackadaisical in the NMP enforcement and refuse to implement the DATCP Siting Law to protect residents and our water from unnecessary contamination. There is an AFO across from my home that expanded without an NMP and Stormwater Management Plan. Lake residents are told to pick up after their dog, not wash their car in the drive, not burn leaves, but everyone ignores the elephant in the room, big Ag, who is arguably the biggest polluters of them all. The WDNR effort is futile when local municipalities refuse to get on board to become great stewards of clean water.

One would think that we would wake up after hearing and witnessing the devastation people have suffered in Kewaunee County, but we'll wait for another catastrophe before we wake up and mobilize.

Thank you for your effort.

Sincerely,
Gail Bolden
N8603 Lakeshore Drive
Fond du Lac, WI 54937

Submitted via e-mail:

The Town of Oshkosh submits the following Public Comment for the Proposed Upper Fox TMDL:

The Town of Oshkosh is required to remove 83 %Total Phosphorus (TP) as documented in Appendix H to comply with the proposed Upper Fox TMDL. Wet stormwater basins remove an average of 50%-75% TP so the TMDL removal rate would appear to be unachievable even with extensive stormwater basin construction throughout our urbanized areas. We are a small town with a highly fractured boundary and grassed swales already lining almost all of our local roads providing stormwater treatment. We are a miniscule contributor to the overall phosphorus loading into Lake Winnebago (a very small fraction of 1% from all MS4s in the watershed including much larger cities and villages according to the TMDL). However, we will be required to build expensive stormwater practices to achieve the much higher level of phosphorus removal mandated by the TMDL through our stormwater permit. We also have very little available land to build these practices in the small areas of the Town not already annexed by our neighboring cities and villages. At the same time, much greater pollutant contributors such as Agricultural facilities and Municipalities without stormwater permits will spend nothing. This is grossly inequitable in terms of reducing pollutant loading into Lake Winnebago since the money we spend will have no effect on the pollutant reduction loading while money spent elsewhere would have a much greater effect. We feel this money is wasted and would prefer to use it in a beneficial manner on an achievable goal. The water quality standard used to develop the TMDL is 40 mg/l which is the same for all lakes in Wisconsin. Lake Winnebago should have a separate standard developed for an enlarged river system that flushes itself twice annually rather than an inland lake as it had always been green and subject to fish kills well before urbanization occurred. Zebra Mussels have been instrumental in cleaning up Lake Winnebago and are not accounted for in the TMDL. We respectfully request the TMDL be re-calculated with a revised standard and achievable goals based on the current state of Lake Winnebago.

Thanks, Keith.

Chuck

--

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January 18, 2019

Mr. Keith A. Marquardt
Wisconsin Department of Natural Resources
625 East County Road Y, Suite 700
Oshkosh, WI 54901

Re: Draft Upper Fox and Wolf Total Maximum Daily Load (TMDL) Report Comments

Dear Mr. Marquardt:

Thank you for this opportunity to comment on the November 30, 2018 draft TMDL Report. These comments are submitted on behalf of the City of Fond du Lac (City). Previous comments submitted by the City are also incorporated by reference.

1. Overarching Concerns

We do not believe the 40 micrograms per liter ($\mu\text{g/L}$) Lake Winnebago total phosphorus (TP) criterion is attainable based on the information presented in the modeling, sediment core analysis, draft TMDL report, and previous studies. Point sources like wastewater treatment plants (WWTPs) and municipal separate storm sewer systems (MS4s) represent a very small fraction of the current TP loading in these watersheds. The United States Geological Survey (USGS) pool lake modeling that indicates if all MS4s and WWTPs were eliminated, it would only reduce the TP concentration in Lake Winnebago from 0.096 to 0.093 (Appendix E of Draft TMDL Report). This reduction is so small that it is not reliably measurable. Based on these overarching issues, it is unreasonable to expect point sources to spend tens to hundreds of millions of dollars to make further TP load reductions until there is better assurance regarding criterion attainability and until significant strides are made with nonpoint source load reductions. If nonpoint sources load reductions are not completed on a similar schedule as the point sources, this TMDL will appear to be a failure in the eyes of the municipal ratepayers, who will bear the majority of the implementation cost.

2. Issues with Agency Responses

The United States Environmental Protection Agency (USEPA) and the Wisconsin Department of Natural Resources (WDNR) completed a responsiveness summary as Appendix L of the TMDL, and the WDNR submitted specific responses to the City as well. In general, the City found the responses disappointing because the responses mainly sought to explain why the agencies were disregarding the City's comments. For example, early on the City made suggestions about using a different allocation method based on cost-effectiveness that would be more equitable. WDNR disregarded this comment without fully evaluating the potential for this type of allocation method.

NAB:\GIS\MAD\1000-1099\1069\131\Design-Studies-Reports\Wastewater Treatment\W3604-Final TMDL Comments\011719.docx

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Mr. Keith A. Marquardt
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The following are several more examples of areas where the City disagrees with the agencies' responses:

- a. In the WDNR's December 6, 2018 letter to the City of Fond du Lac there is an incorrect, or at least, misleading statement. The last sentence at the end of the third paragraph indicates the cities (City of Fond du Lac and City of Oshkosh) "...acknowledged that these previous modeling questions had been addressed." That is not true; the cities acknowledged that *some of* the previous modeling questions and comments had been addressed through updates to the modeling and TMDL. Most of the City's previous comments and concerns still stand and are incorporated herein by reference.
- b. In Appendix L of Draft TMDL Report:
 - (1) The 20 µg/L TP concentration for reference streams is discussed as if it is an accepted value. The USGS report in Appendix E suggests it is close to a reference TP concentration for wadeable streams in central Wisconsin. It would be helpful to provide more information to support this value. The Upper Fox and Wolf watersheds are in a different subcoregion than the central Wisconsin area, and according to USEPA the 25th percentile TP concentration in the subject subcoregion is 80 µg/L, almost three times higher than the 25th percentile TP concentration in the central Wisconsin subcoregion (USEPA 822-B-00-018, 2000). This raises additional questions about the assumptions in the modeling and the attainability of the 40 µg/L pool lake criteria.
 - (2) There are statements that the modeling shows that internal loading decreases by the same percentage as the decrease in external loading. However, it is our understanding that USGS made this simplifying assumption that internal loading decrease as the same rate as external loading as part of their modeling effort, rather than using modeling to predict the reduction in internal loading. This should be clarified.
 - (3) There are statements that the modeling shows that the 40 µg/L TP criteria will be met if TP loadings are reduced by the amount indicated. However, the model inputs are based on many assumptions, some of which may be off by a large percentage. Therefore, we do not believe it is appropriate for WDNR to state that the modeling provides evidence that the criteria are achievable.
 - (4) The TMDL notes that it may take more than 70 years to reach the TMDL targets. We understand from previous meetings that this timeline starts when the load reductions are met. Implementation will take decades. The agencies should make this clearer in the final TMDL in order to better manage the public's expectations.
 - (5) The agencies responded to comments related to attainability and the paleoecological study by applying a confidence interval to the results. The

Mr. Keith A. Marquardt
Wisconsin Department of Natural Resources
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confidence interval was not presented in the paleoecological study report (Appendix F) and appears arbitrary and contrived to get the data to better fit the agencies' conclusions. It seems just as reasonable to conclude that the historical TP was 50 µg/L or higher and that the TP can be 45 µg/L or higher and still meet chlorophyll (CHL) targets.

- (6) Because of the attainability question, we continue to question the appropriateness of the 20 µg/L CHL target. The agencies responded that Wisconsin-specific shallow lake user data supports this target. This data should be presented. Data from shallow southern Wisconsin drainage lakes, preferably lakes from the same subcoregion, should be used.

3. WWTP Compliance Options.

Wisconsin Admin Code § NR 217.16 allows TMDL-based limits to be used in Wisconsin Pollutant Discharge Elimination System (WPDES) permits for two or possibly three permit terms if nonpoint source loads have been substantially reduced. NR 212.76, on the other hand, simply says TMDL-based water quality based effluent limits (WQBELs) may be included in permits in lieu of or in addition to other WQBELs. The WDNR should provide assurances that further reduction will not be demanded of point sources if the nonpoint source reductions are not met within the next 20 years.

The City's wastewater treatment and resource recovery facility (WTRRF) is faced with multi-million dollar compliance costs associated with phosphorus compliance, even with the higher TMDL-based limit. The City is already expending millions of dollars on sidestream treatment and biological phosphorus removal improvements to meet interim phosphorus limits, in addition to approximately \$250,000 a year in multidischarger variance (MDV) payments to counties. The City appreciates that the MDV is available because we see it as a way to reduce overall compliance costs while making phosphorus and TSS load reductions throughout the watershed. However, the MDV is only authorized for approximately eight more years and its future reauthorization is uncertain. Because of the potential for watershed improvements and reduced WWTP compliance costs, the City encourages the WDNR to make the MDV a more permanent option with less stringent economic criteria.

The City appreciates that the agencies included adaptive management (AM) targets in the TMDL; however, we believe there is an error in AM target calculations. The City's AM target should not be lower than 40 µg/L because the City discharges directly to Lake Winnebago. Table 1 in Appendix K lists the City's AM target as 32 µg/L, 20 percent lower than the lake criterion. If the modeling was used to set these targets, then it calls the model validity into question. The City requests that the agencies check the models and the calculations to be sure there are not too many conservative assumptions. We request the City's AM target be changed to 40 µg/L with the understanding that this would be measured as an in-lake summer mean concentration.

The City is interested in the concept of water quality trading (WQT) and believes it has the potential to result in observable water quality improvements. However, using current Wisconsin WQT guidance, this TMDL will result in a credit threshold so low that long-term credits will be essentially impossible to obtain. The administrative and construction costs associated with interim credits make WQT a much less viable option.

Mr. Keith A. Marquardt
Wisconsin Department of Natural Resources
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Table 1 also indicates that the City WTRRF has a TP wasteload allocation of 5,763 pounds per year (lbs/yr) and a “Local Wasteload Allocation” of 33,815 lbs/yr. The City WTRRF discharges directly to Lake Winnebago. The City requests that the agencies explain why the City WTRRF TP wasteload allocation differs from the “Local Wasteload Allocation”, and how downstream credits could apply to a discharger in TMDL subbasin 75 (Lake Winnebago).

The agencies should understand that by making these watershed compliance options so limited, difficult, and costly, there will be less reduction of phosphorus and TSS loadings throughout the watershed and less water quality improvement overall.

4. Phased, Staged, or Adaptively Implemented TMDL

The City believes the agencies can find a way to phase, stage, or adaptively implement this TMDL and make it more equitable for point source rate payers, who are the smallest sources of TP loading in the watersheds. If the agencies do not believe higher interim wasteload allocations will be acceptable or approvable, then a different allocation method based on cost-effectiveness in lieu of proportional contribution could be used. For example, there are USEPA-approved nutrient TMDLs in Minnesota that do not require any additional load reductions from WWTPs, and instead focus on nonpoint source load reductions, where compliance costs are lower and water quality improvements can be made throughout the watershed, rather than only at the end of an outfall pipe. A phased TMDL would allow more time for additional study and monitoring to help answer stakeholder questions about attainability and appropriate targets.

5. TSS Targets

The agencies added a total suspended solids (TSS) target of 12 milligrams per liter (mg/L) to the most recent draft TMDL. We understand the 12 mg/L TSS value is a target meant to support narrative criteria and it is not a numeric criterion. Nevertheless, we have had only a short time to review this change in the TMDL and are concerned about the potential implications of this target. The 12 mg/L target was not developed through a rulemaking process, and it was not publicly vetted in these TMDL watersheds. The City, therefore, requests additional explanation from the agencies regarding the development of the TSS target and reserves the right to review and comment on this target in the future, particularly if it impacts the City’s wasteload allocations or WPDES permits for the WTRRF or MS4.

6. Concurrence with City of Oshkosh TMDL Comments

The City concurs with the concerns expressed by the City of Oshkosh in its formal TMDL comments submitted to WDNR in January 2019.

7. Closing Remarks

Thank you again for your efforts to engage the City and provide opportunities for comments. Please let us know if you have any questions or would like us to suggest specific language to incorporate into the TMDL Report. The City requests the opportunity to review the WDNR’s responses to these comments and to discuss these issues further prior to submitting the TMDL to the USEPA for approval. The City

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Mr. Keith A. Marquardt
Wisconsin Department of Natural Resources
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hopes the agencies will seriously consider approaches that will make these TMDLs more cost-effective and attainable.

Sincerely,

STRAND ASSOCIATES, INC.®



Jane M. Carlson, P.E., ENV SP



Nicholas A. Bartolerio, P.E.

c: Jordan Skiff, City of Fond du Lac
Cody Schoepke, City of Fond du Lac

Submitted via e-mail:

Hi Keith

I just had a few comments on the TMDL plan...

On the cover page: Green County is listed instead of Green Lake County

Page 61: On the List of permitted CAFOs in the Upper Fox-Wolf Basins, MAM Farms is omitted.

Page 62: PrideView Dairy LLC and MAM Farms are both omitted from the map. I also see that some other CAFOs along the border of the watershed are included...you could our other CAFO, Hilltop Dairy, which is in the Rock River Watershed.

By the way, I'm sure you have heard about the passing of Charlie Marks. We've lost a great man!

Paul Gunderson
County Conservationist
Green Lake County LCD
(920) 294-4051
pgunderson@green-lake.co.wi.us



New London Wastewater Treatment Facility
215 N. Shawano St.
New London, WI 54961

January 18th, 2019

Keith A. Marquardt
Wisconsin Department of Natural Resources
625 E County Road Y, Suite 700
Oshkosh WI 54901



Hello Mr. Marquardt,

This letter is in regards to the proposed Total Phosphorus TMDL that was released for public comment on November 30th 2018. I had brought this subject to the New London Board of Public Works at the January meeting held on January 7th 2019 to describe your findings and to address how this proposed ruling will affect the treatment facility's future discharge. The Board felt the proposed limits are restrictive and do not address the major contributors to the Total Suspended Solids and Total Phosphorus loadings to the Wolf River watershed. The following comments address the concerns of the City regarding the proposed Total Maximum Daily Load (TMDL).

During the Public Hearing on December 15th 2018, it was stated that a 73% reduction in phosphorus loadings from all sources in the Fox / Wolf River watershed basin over the course of 75 years will bring the total phosphorus concentration down to 0.040 mg/L in Lake Winnebago and the pool lakes. Using Figure 15 on page 69 in the Total Maximum Daily Loads for Total Phosphorus and Total Suspended Solids – Upper Fox and Wolf Basins – Public Hearing Draft, November 30th 2018, only 11% of the total phosphorus loading from the Wolf River basin is from wastewater treatment facilities. A 73% reduction from wastewater treatment facilities would result in 8% removal of the total phosphorus loading. This still leaves 66% of the total phosphorus loadings coming from non-point agricultural contributors. If it is known that two thirds of total phosphorus is coming from these areas, shouldn't this be the main focus of the TMDL? Other than Concentrated Animal Feed Operations (CAFO), the proposed TMDL outlines reductions in other agricultural activities but appear to only be recommendations of best management practices and not limits for the property owners in which the pollution comes from. Whenever we request fields for sludge application, the DNR provides maps with setbacks and other information in a matter of hours. With today's GIS programs and other technology why isn't the DNR, counties or townships pinpointing and enforcing problem areas in their portion of the watershed?

Section 7.3.10 and 7.3.11 on page 101 of the draft TMDL outline options to which municipalities can pay for and manage the non-point sources in their vicinity to reduce the burden of their permit level. Due to the lower Median Household Income for the City of New London it would be irresponsible to require rate payers to pay more for sewerage services that are not utilized in the community. New London does not have the manpower to implement, oversee and enforce best management practices for farms in the same watershed as the City. If New London were to undertake land management of a farm that does not utilize a nutrient management program, there is no guarantee that the City will receive long term credits for total phosphorus during the course of a 5 year permit. This is especially true if the river or tributary has many farms where no nutrient management program is followed and nutrient pollution is significant.

215 N. Shawano Street – New London, WI 54961
Phone (920) 982-8511 – www.newlondonwi.org

The economic impact on the rate payers for having to refurbish the treatment facility to meet lower limits on total phosphorus will total roughly four to five million dollars. This would be an additional \$5.00 - \$7.00 per thousand gallons of water used. A large percentage of our community is already struggling to pay their utility bills. As stated in Section 7.3 on page 105 of the proposed TMDL, there are many avenues in which non-point dischargers can get economic assistance without relying on funding from treatment facilities. These agricultural based programs would have better phosphorus reduction results per dollar spent than improvements at the treatment facility.

The proposed TMDL could eliminate much needed revenue for the City. Future growth in New London's industrial parks could be stifled if corporations have to pay higher sewerage costs or limit their ability to discharge due to phosphorus loading caps. This exacerbates the Median Household Income issue stated earlier where good paying jobs would not come to the area.

In the past the New London Wastewater Treatment Facility has been proactive in taking in contaminated water from environmental issues. In 2017 a farmer spread manure on a field with a significant slope during the winter. A January thaw caused snow to melt and liquid manure flowed into a tributary and up to wells at neighboring houses. We took in thousands of gallons free of charge to help out. After the Blizzard of 2018 we took in almost 4,000,000 gallons of pond waste from a local food processor to prevent them from discharging untreated waste into a river. Does the DNR have a plan to forgive treatment facilities if they violate the permit while rendering aid during an environmental crisis? If not, the proposed TMDL could be restrictive to the point we would have to deny aid rather than pay fines for being a Good Samaritan.

Lastly a question on how penalties are quantified. The 2022 WPDES Permit will surely outline the penalties regarding excessive discharge for New London's outfall but there is some confusion as to how the Department will determine a violation.

In the current monthly Discharge Monitoring Report (DMR) forms there are columns for Daily Maximum, Daily Minimum, Weekly Averages and Monthly Averages. According to *Appendix H Total Phosphorus Allocation Table 3*, New London will be allocated 2.8 pounds of total phosphorus per day or 1,038 pounds per year. What parameter will the violation be determined? Daily, Monthly or Annual? In 2017 the New London Wastewater Treatment Facility had effluent phosphorus discharges where some months the daily average and monthly average for pounds generated exceeded 2.8 pounds per day. The pounds of phosphorus charged on the **NR101 Wastewater Fee** for 2017 was 941.3 pounds for the year. This is 96.7 pounds less than what the proposed allocation is. Would any violations be levied against the Facility?

Thank you for your time and I look forward to your response. If you have any questions please do not hesitate to contact me.

Regards,



Gary Henke, Mayor
City of New London

215 N. Shawano Street – New London, WI 54961
Phone (920) 982-8511 – www.newlondonwi.org



City of Fond du Lac

First on the Lake

Website: www.fdl.wi.gov

City-County Government Center
160 S. Macy Street~P.O. Box 150~Fond du Lac, WI 54936-0150

January 18, 2019

Mr. Keith Marquardt
Wisconsin Dept. of Natural Resources
625 E. County Rd. Y, Suite 700
Oshkosh, WI 54901

Dear Mr. Marquardt,

Thank you for the opportunity to comment on the December 2018 draft Total Maximum Daily Load report for the Upper Fox/Wolf Watershed. These comments are submitted from the perspective of the City of Fond du Lac MS4 (Municipal Separate Storm Sewer System).

1. While we understand that the TMDL process is incredibly complex and that no stakeholder will believe the results to be entirely fair, our MS4—and I'm sure other point sources—continue to be very concerned about the disparity between point source and nonpoint source expectations. The report confirms that a majority of the phosphorus entering Lake Winnebago is from nonpoint sources, yet actions by those sources are voluntary and require a cost share. MS4s and wastewater plants will be spending millions of dollars to achieve the limits set by the TMDL, with no measurable improvement to the Lake's water quality.
2. MS4 existing pollutant loads (TSS and TP) and waste load allocations (WLAs) were calculated differently during the development of the Upper Fox / Wolf River Basins TMDL compared to all previous TMDLs in the state. One example is the use of WinSLAMM loadings versus SWAT loadings for urban areas. All previous TMDL analyses were based on WinSLAMM loadings for MS4s, which is consistent with the most common modeling tool used by MS4s and endorsed by DNR. The SWAT generated MS4 pollutant loadings used in the Upper Fox / Wolf Basin TMDL results in pollutant loadings that are orders of magnitude less than WinSLAMM. Another discrepancy is the delivery point, and thus reporting point, for the MS4 pollutant loads. Supposedly the SWAT modeling accounts for pollutant deposition in the streams and channels between the storm sewer outfall and a receiving water. However, for the two major MS4s in the Upper Fox / Wolf River Basins (Oshkosh and Fond du Lac), most of the storm outfalls discharge directly to the impaired receiving water and there is little to no pollutant deposition occurring. Both of these issues mean that calculating MS4 progress toward achieving the WLAs will require new approaches compared to other TMDLs. This will especially be a concern if/when MS4s evaluate water quality trading with agricultural sources (for example: which urban pollutant loads will be applied – SWAT or WinSLAMM values?). The new and unique approach for MS4 pollutant load analysis, and how it will impact implementation approaches for MS4s, must be more clearly defined in the Upper Fox / Wolf River Basins TMDL document.
3. The MS4 WLAs require a very high reduction in pollutant loads. Based on previous citywide WinSLAMM modeling and ongoing citywide WinSLAMM modeling we do not believe that it is currently technically feasible to meet the proposed WLAs.

Feel free to contact me at jskiff@fdl.wi.gov or 920-322-3472 with any questions.

Sincerely,

Jordan Skiff
Director of Public Works

Fond du Lac City Government's mission is to provide excellent local government through responsiveness and accountability to the citizens of Fond du Lac. Our values: Excellence in Service, Honesty, Integrity, and Personal Accountability guide everything we do.



City Attorney's Office
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<http://www.ci.oshkosh.wi.us>

January 18, 2019

Keith A. Marquardt
Wisconsin Department of Natural Resources
625 E County Road Y, Suite 700
Oshkosh WI 54901

RE: Draft TMDL dated November 30, 2018

Dear Mr. Marquardt,

Please accept these comments from the City of Oshkosh ("City") regarding the draft TMDL dated November 30, 2018 in connection with the City's WPDES Permit (Permit No. WI-0025038-09-0) and MS4 Permit (WI-S050075-2).

LEGAL COMMENTS

I. TMDL allocations for POTWs and MS4s as well as the DNR guidance documents for implementing MS4 TMDL allocations are rules within the meaning of Wis. Stat. § 227.01(13) that require DNR to go through the formal rulemaking process.

Though DNR has express authority to include TMDLs in WPDES permits, the TMDL allocations for the Upper Fox/Lake Winnebago watershed as well as the DNR TMDL guidance used to implement TMDL allocations to MS4's for P and TSS in the Upper Fox/Wolf River/Lake Winnebago watershed are void because of DNR's failure to follow the rulemaking procedures in Wis. Stat. Chap. 227.

A TMDL meets the plain meaning of the definition of "rule" under Wisconsin law because TMDLs are standards that are generally applicable, have the effect of law, and are issued by the DNR to interpret the Clean Water Act and Wisconsin law. TMDLs are not subject to the exclusion contained in Wis. Stat. § 227.10(zp) because the program it

City Attorney
City Hall, 215 Church Avenue P.O. Box 1130 Oshkosh, WI 54903-1130 920.236.5115 <http://www.ci.oshkosh.wi.us>



refers to (i.e., the nonpoint source water pollution abatement program) is separate from the development of TMDLs for impaired waters. In the absence of adopting a TMDL as a rule, DNR may not place the TMDL limit in a permit. Wis. Stat. § 227.10(2m). The adoption of the TMDL allocation for this watershed without following rule-making procedures cannot be justified as state plans that comply with federal law in the absence of explicit statutory authority to do so. See Wis. Stat. § 227.11(3)(a).

Likewise, the DNR has adopted TMDL Guidance #3800-2014-04 effective October 20, 2014 for the implementation of TMDL allocations in MS4 permits (the "TMDL MS4 Guidance") without proceeding through rule-making. For the same reasons stated above, the DNR's use of the TMDL MS4 Guidance for implementing MS4 TMDL allocations is contrary to Wis. Stat. sec. 227.10(2m). In addition, the adoption of the TMDL MS4 Guidance and use for implementation of TMDL allocations for MS4 permits is contrary to the prohibition that guidance documents cannot be adopted without the procedural safeguards of notice and opportunity for the public to comment prior to adoption. See Wis. Stat. § 227.112.

Moreover, analogous Wisconsin case law and case law from Ohio and Idaho supreme courts that is directly on point strongly support the legal conclusion that TMDLs are rules within the meaning of Wis. Stat. § 227.01(13) and therefore DNR must go through the formal rulemaking process to validly establish the TMDLs for the Upper Fox/Lake Winnebago watershed. See *Wisconsin Electric Power Company v. Department of Natural Resources*, 93 Wis. 2d 222 (Wis. 1980); *Fairfield Cnty. Bd. of Comm'rs v. Nally*, 143 Ohio St. 3d 93 (Ohio 2015); *Asarco Inc. v. Idaho*, 138 Idaho 719 (Idaho 2003).

Finally, the DNR's position regarding whether Chapter 227 requires it to issue a new rule when promulgating TMDLs and adopting/implementing MS4 TMDL Guidance to the extent it relies on the DNR's interpretation of provision within Chapter 227 or other applicable law, is not entitled to judicial deference. See *Tetra Tech EC, Inc. v. Wisconsin Dep't of Revenue*, 2018 WI 75, ¶ 84, 382 Wis. 2d 496, 564, 914 N.W.2d 21, 54 (statutory interpretations by administrative agencies are reviewed *de novo* without judicial deference) and AB 1070/Senate Bill 884.



II. Assuming for purposes of argument only that the DNR is not required to follow rulemaking procedures for adopting the TMDL report, the DNR should nonetheless exercise its legal authority to adopt regulations covering the agricultural sector as a precondition to enforcing the allocation in the TMDL report.

As reflected in the City's Technical Comments, the modeling used in the draft TMDL report has demonstrated that an application of the existing Wis. Admin. Code Chapter NR 151 regulation for agricultural sources will not result in the attainment of the water quality criteria for the watershed. The DNR has adequate legal authority to propose and adopt more stringent regulations for these agricultural sources under Wis. Adm. Code §§ NR 151.004 and 151.005. The DNR should condition the imposition of any P and TSS allocations for point source discharges based upon the DNR's adoption of more stringent rules for agricultural sources in the TMDL report.

III. The assumption used by the DNR for zero discharges allocated to CAFOs is subject to legal uncertainty.

As is referenced in the technical comments below, the City is challenging the assumption used by the DNR in the TMDL report that CAFOs are not permitted to have a discharge from certain operations.

In a separate action, on July 31, 2017, the Dairy Business Association challenged the DNR's (as well as EPA's) position that the application of NRCS 635 does not reliably ensure no discharge of pollutants to navigable waters for the feed storage practices for CAFOs. On October 19, 2017, the DNR entered into a settlement of that action, and agreed to allow the application of NRCS 635 as valid runoff controls under the WPDES Permit Program for CAFOs.

This settlement is currently being challenged in Milwaukee County Circuit Court by various parties claiming that re-imposition of NRCS 635 does not adequately protect against discharge to navigable waters by CAFOs. See *Clean Water Action Council of Northeast Wisconsin v. Wis. Department of Natural Resources*, Case No. 2017 CV 012861 (November 17, 2017). This pending litigation has raised substantial legal issues about the reliability of the DNR's assumption in the TMDL report that no discharges should be allocated to CAFOs in the TMDL report.

City Attorney

City Hall, 215 Church Avenue P.O. Box 1130 Oshkosh, WI 54903-1130 920.236.5115 <http://www.ci.oshkosh.wi.us>



IV. The DNR must allow supplemental comments to be filed to the TMDL report due to inadequate explanations for conclusions contained in the draft report.

The DNR has imposed January 18, 2019 as the deadline for all comments to the draft report. For a number of important issues, there is inadequate information contained in the draft report for the City to provide final comments. Some of these issues described more fully in the Technical Comments below, include the following:

- There is no adequate explanation for the increased allocation for baseline discharges assigned to point source discharges in the report and the implication of such increases for the final allocation of P and TSS assigned to point source dischargers for future WPDES permits.
- There is substantial uncertainty regarding the manner in which the DNR determined the Water Quality Trading examples in Appendix K and Tables 1 and 2 for a specific facility.
- There are numerous questions raised about the manner in which Adaptive Management Targets were referenced in Appendix K and Table 1.
- There are numerous questions raised about the different approaches for allocations made to MS4s in this TMDL versus the TMDL approaches taken in other watersheds.

These are only a few of the many questions raised by the City in the Technical Comments below; answers to which are necessary before the City will be in a position to file final technical comments. Without answers to these questions, the City will be deprived of the opportunity to provide meaningful comments to the draft TMDL report.

For all of these reasons, the City respectfully requests that it be afforded an additional 30 days for supplemental comment following the receipt of the DNR responses to the numerous questions raised by the City in these Technical Comments.



TECHNICAL COMMENTS

The City of Oshkosh incorporates by reference the following: (1) comments provided to the DNR on August 3, 2018 by Oshkosh; (2) the comments submitted by the City of Fond du Lac on August 2, 2018; and (3) all of the previous comments submitted by the two cities as referenced in the August 3, 2018 letter to the DNR, a copy of which is attached to these comments. Please be advised that the City of Oshkosh is incorporating these previously filed comments by reference since many of them were not adequately addressed by the DNR.

In addition, the City of Oshkosh joins in the written comments by the City of Fond du lac dated January 18, 2019.

In addition to these comments, the City of Oshkosh has the following technical comments listed below.

Technical Comments Relating to the City's Publicly Owned Treatment Plant

In the WDNR's December 6, 2018 letter to the City of Oshkosh the last sentence at the end of the third paragraph states that the City "...acknowledged that these previous modeling questions had been addressed." That is not true and the City has repeatedly requested the WDNR respond to detailed modeling questions submitted during the TMDL model development. The WDNR simply stating that comments were "considered" is not consistent with the commitment stated during early TMDL public meetings that comments would be incorporated and responded to. All comments submitted by the City should be included in Appendix L and the concerns raised in prior comments still stand.

General

Drainage Basin Boundaries: We understand from previous meetings that the sub-basins and subwatersheds modeled in the TMDL are not always consistent with the HUC boundaries, such as a HUC 12 or HUC 8 boundary. The HUC boundaries are not shown in the TMDL so it is not possible to see the significance of this inconsistency. Please identify these differences in the TMDL and explain how references to the HUC 12



boundaries, such as in trading and adaptive management discussions, will be impacted. This could be significant and permitted dischargers should have the ability to review this response and update prior to submitting the TMDL to EPA.

Agricultural

What percentage of agricultural land, or acreage of agricultural land, is operated by or in contract with a concentrated animal feeding operation (CAFO)? This would include lands owned by CAFOs or affiliates, lands leased by CAFOs or affiliates, or lands that are contracted to either receive manure or that sell product (e.g. feed, bedding, etc.) to a CAFO. These statistics should be reported in the TMDL.

CAFOs are not permitted to have a discharge from their manure storage, process wastewater or from production areas, but those releases happen. When they do happen, which is more than yearly, the loadings are significant. The TMDL should include these loadings in the baseline conditions for CAFOs, and increase the overall total baseline accordingly, so they are not accounted for in other sectors like municipal wastewater. The CAFOs should also have a reduction so that the loading associated with their operations is properly accounted for in the TMDL. It is not appropriate to simply say those loadings don't exist because the permits don't allow them. The reality is it happens and is a significant event loading, and the contribution should be properly estimated and categorized with the source of the loading.

The agricultural load allocation targets (Appendix J) appear to be in the range of other targets for well-managed agricultural operations. However, the phosphorus loss from agricultural fields in baseline conditions is very low and is not consistent with the fact that the majority of the land use and phosphorus loading is from agricultural sources. For example, 87 of the 89 sub-basins are all less than 6 lbs/ac/yr (Appendix J), where the 87 sub-basins average around 2-3 lbs/ac/yr. While this is output from SnapPlus, it is not clear if this is the PI, or if different soils or slopes were used than those used for the PI calculation. Regardless of this potential difference in calculating the phosphorus loss, agricultural contribution to baseline conditions, and therefore the reductions needed to achieve allocations, are very much under estimated. The simple fact that nearly all agricultural land is reported far below 6 lbs/ac/yr raises significant questions regarding the accuracy of the information.



Provide a summary of how SnapPlus output was validated for the baseline conditions. Please include a summary of inspections completed by the TMDL team to ensure nutrient management information reported is accurate and reflective of actual conditions.

Lake Loading and Internal Cycling

For the purposes of the TMDL and allocations to permitted entities, the internal loads within the pool lakes are historic and there is nothing that any of the source categories can do about this historic, or baseline, condition. We agree that reducing external loading can reduce future internal loading, however the TMDL and its allocations look forward to making reductions from the baseline conditions. The internal loading should be its own source category, these reductions should be completed by the State, and the internal loadings should not be coupled with reductions (allocations) required by external sources.

While lake modeling and TMDL allocations are on an annual basis, the limits translated from the allocations are seasonal. While the annual cycling of internal loading may be zero, the growing season shows the internal loading as a source and should have a reduction associated with them. Consequently, the internal loading should be considered independent of external loading and there should be reductions (allocations) associated with the internal loading.

Resuspension of lake sediment and its contribution to water column phosphorus concentrations is also from boating and the presence of common carp or other non-target bottom fish.

Nagawicka Lake was used for groundwater phosphorus concentrations to estimate groundwater loadings, but the soils, land use and agricultural activities for Nagawicka Lake are very different than that of the pool lakes. What validation was completed to ensure that the Nagawicka Lake-based information is appropriate for the pool lakes?

The lake modeling presented reductions needed (67-75%) from "existing conditions", and not baseline conditions. If baseline conditions are considered, the reductions would be even greater. This is further justification that a phased TMDL implementation needs



to be considered as there is significant time and reductions needed to achieve water quality.

Loadings

The growing season mean to flow weighted mean (GSM-FWM) ratio was assumed to remain constant within a sub-basin. How was this assumption validated? With 20 locations, there is opportunity for testing this theory.

In calculating a GSM-FWM ratio we don't disagree that "hydrologic drivers" can remain constant within a sub-basin, but hydrology is only half of the phosphorus loading equation where phosphorus concentrations could vary greatly when loading is more impacted by land cover (i.e. higher loading when ag fields do not have cover). A high loading event(s) can occur equally with high precipitation and low runoff concentration (e.g. agricultural field with cover), as an event with low precipitation and high runoff concentration (e.g. agricultural field without cover). Because cover on agricultural land can vary significantly between the growing season and outside this season, how was this accommodated in this simplified approach of converting annual to growing season loading capacity?

For the six locations used for FWM-GSM ratios, what were the minimum thresholds for flow and phosphorus data? Were there certain number of years of data, number of water quality samples, etc.? Please summarize the available data for the six sites since these six sites were used for all 89 sub-basins. Why weren't all 20 locations used?

How are county or state transportation corridors included in allocations if they are outside of MS4 boundaries?

Site Specific Criteria Analysis

The site-specific criteria (SSC) discussion contained in Section 2.4 of the draft report really has no relevance to site specific criteria as described by EPA (Water Quality Standards Handbook, 2017 update):



The EPA's regulation at 40 CFR 131.11(b)(1)(ii) provides that states and authorized tribes may adopt water quality criteria that are "modified to reflect site-specific conditions." Site-specific criteria, as with all criteria, must be based on a sound scientific rationale and protect designated uses and are subject to EPA review and approval or disapproval under Section 303(c) of the CWA. A site-specific criterion is developed to protect aquatic life at a particular site, usually by taking into account a site's physical, chemical, and/or biological conditions (i.e., water quality characteristics or species composition).

The analysis included in the report includes three sources to evaluate whether a SSC is appropriate for Lake Winnebago; the first two are the paleoecological study of diatoms in sediments and a lake modeling analysis to look at reference conditions in the lake prior to extensive anthropogenic development and hydrologic modification. Reference conditions have absolutely no relationship to appropriate criteria to protect designated uses of Lake Winnebago. "Water quality criteria represent the conditions (e.g., concentrations of particular chemicals, levels of certain parameters) sufficient to restore and maintain the chemical, physical, and biological integrity of water bodies and protect applicable designated uses." Further comments will be made on the paleoecological study and lake modeling study.

The third source information related to the SSC discussion was an examination of total phosphorus and Chlorophyll a relationship. This analysis is topically related to designated uses – in that it was using a Wisconsin criterion associated with recreational use in shallow lakes. But by using a general chlorophyll criterion, it has not specifically looked at recreational use issues specific to Lake Winnebago.

Paleoecological Study and Modeling of Reference Conditions

The paleoecological survey of sediments cast significant doubt on the appropriateness of the 40 µg/L total phosphorus water quality goal. Top layer diatoms correspond to total phosphorus concentrations of 108 µg/L in the north basin of Lake Winnebago, 94 µg/L in the south basin. The average of these values is within 10% of the observed value of



97 µg/L of water from which the top layer of diatoms was deposited. These results indicate that high confidence in the paleo data is warranted.

The bottom layer of diatoms when averaged correspond to a TP concentration of 43.5 µg/L. As the bottom layer is at least 150 years old, and may be centuries older, the bottom layer represents water quality under ideal conditions in the ancestral water body of Lake Winnebago (prior to damming).

If baseline historic conditions prior to European settlement were eutrophic, how can a betterment of those conditions be attained today under even the most optimistic scenario? Using the Jensen model, there is no modeling scenario in the TMDL in which 40 µg/L is attainable. Moreover, the 90% confidence interval for paleoecological results are 32-50 µg/L in the north basin and 37-59 µg/L in the south basin. The median value for each basin is 41 and 48 µg/L. There is therefore more than a 50% probability the historical reference condition exceeded the proposed TP water quality standard.

This historic level is a reference but has little or no relationship to an appropriate water quality standard to protect designated use, as mentioned previously. Pre-settlement conditions have not been (and should not be) a focus of the TMDL, they were not a goal of water quality standard development, and they should not be the benchmark for the highly manipulated hydrologic regime of Lake Winnebago.

Lack of a Use Attainability Analysis

Previous comments submitted by the Cities (Fond du Lac and Oshkosh) requested that a use attainability analysis (UAA) be conducted at least concurrently with the TMDL development. WDNR has indicated that a UAA could be conducted after the TMDL is developed.

EPA defines that a UAA "is a structured scientific assessment of the factors affecting the attainment of uses specified in Section 101(a)(2) of the Clean Water Act (the so called "fishable/swimmable" uses). The factors to be considered in such an analysis include the physical, chemical, biological, and economic use removal criteria described in EPA's water quality standards regulation (40 CFR 131.10(g)(1)-(6))."



While EPA requires a UAA for removal of a use based on its water quality standards rules promulgated in the mid-1980s, it really should be done as part of any water quality standard setting effort and especially for consideration of site specific criteria as recommended by many (including a handbook developed by the National Association of Water Agencies and Water Environment Research Foundation in 2005 entitled Collaborative Water Quality Solutions: Exploring Use Attainability Analyses).

The TMDL report includes no confident demonstration that the water quality standard for total phosphorus of 40 ug/L is attainable. In the modeling analysis, the summer total phosphorus balance for Lake Winnebago has 55% contributed from internal loading. Sediments respond to reductions of external loading very slowly and the assumption that internal loading and external loading are directly and immediately related is not proven. The Jensen model demonstrates that a 75% reduction in total phosphorus today will still will not result in meeting the 40 µg/L standard by 2135 (See figure 15 of modeling report), but would meet a 60 µg/L standard by the end of this century. As cautiously mentioned in the modeling report, in-basin controls may be needed to meet water quality goals.

The reason the attainability of the standard is important to point sources is that point sources will incur significant capital costs within the next few years and operating expenses for the foreseeable future to achieve their required reductions. As demonstrated in the summary of watershed loads in Table 12, point sources contribute about a quarter of the controllable TP baseline load within the watershed. Most WWTPs currently discharge below their respective baseline loadings, and additional reductions will come at a much higher incremental cost. Reductions from other sources will take a much longer time frame and are more difficult to enforce. If the standard is indeed not attainable, point sources dischargers will have incurred substantial costs with little associated benefit.

Lake Modeling – General

Lake models are purported to show reference TP standards of 32 to 33 µg/L in Lake Winnebago. These standards are flatly contradicted by paleoecological evidence. According to the Wisconsin DNR reference conditions are set by from paleoecological studies "to establish the excellent range for TSI conditions, WDNR uses excellent or



“reference” conditions inferred from total phosphorus (TP) values based upon preserved diatom communities from pre-settlement times found in lake bottom sediment cores¹.”

In light of the WDNR reference condition policy, how do the Lake Winnebago TMDL study “reference conditions” measure up? For the north basin, 40 µg/L is the 30th percentile value in the 32 – 50 µg/L range. For the south basin, 40 µg/L is 15th percentile. Because the baseline is at the bottom of the north basin range and not within the south basin range, there is a 90% probability that the reference condition is wrong. This causes great concern that the modeling is not sufficiently supported by data.

Whereas the BATHTUB model provides interesting conceptual scenarios of watershed budgets, it presents no timelines and thus no means of capturing the temporal dynamics of water quality remediation. The BATHTUB model provides limited insight into the highly dynamic interactions of external loading and internal cycling of nutrients in Lake Winnebago, and therefore provides limited insight for site specific criteria consideration.

A reduction of 75% of external loading is highly optimistic because most of it comes from nonpoint sources. If attainable, it will not be so for some decades to come. It would be useful to run the Jensen model with a realistic phasing of watershed controls, e.g. 10% reduction by 2020, 40% by 2030, etc. to determine the timeline to meet water quality standards. This should be included in the TMDL to inform the allocations and implementation timeline as the TMDL is the regulatory document. This should not be saved for the Implementation Plan because it will be too late for consideration in applying the TMDL to discharge permits.

Allocations

Point Source individual permit baseline phosphorus loadings have significantly increased from prior information communicated in stakeholder meeting prior to the draft TMDL (August 23, 2017 stakeholder meeting). The TMDL reports 19% of baseline loading is from point source individual permits for the entire basin, up from 12% reported in the August 2017 meeting. For just the Upper Fox basin, it increased from 18% to 29%. For

¹ <https://dnr.wi.gov/news/input/documents/guidance/wiscalmguidance.pdf>



“non-controllable” sources like forest/wetland, baseline phosphorus loading decreased from the August 2017 stakeholder meeting to the draft TMDL from 28% to 10%. A detailed discussion should be provided on how these baseline loadings have changed and explanation of how this has impacted point source allocations when the proportional allocation approach has “adjusted” point source allocations equal to the sub-basin target.

Only a single allocation approach was utilized even though pool lake modeling shows significant disparity between the impact of municipal and agricultural sources on achieving pool lake water quality. There are significant cost differences between municipal and agricultural source reductions but this is not considered in the TMDL. In response to previous comments, DNR has indicated that the proportional approach provides equal treatment and is cost-effective. The term “cost effective” is commonly used by DNR, such as in facility planning, for alternatives whose costs are within 10% of each other. We request that a cost allocation approach be incorporated in the TMDL to demonstrate this is true. Including this allocation approach will also support a framework for an adaptive implementation of the TMDL.

The point source technology limit for total phosphorus is 1 mg/L and was enacted decades ago. It has been fully implemented for many years and is reflected in the TMDL “existing conditions” and baseline source loads. There have also been approved BMPs for municipal storm water and nonpoint sources. No analysis has been made regarding the degree to which these BMPs have been implemented and are reflected in current and baseline loading. Using an even reduction approach to allocations makes the assumption that all sources have evenly implemented technology-based approaches. For point sources, these technology-based limits have already significantly lowered total phosphorus. This similar reduction has not likely been implemented by nonpoint sources. The TMDL response to comments discussed allocation methodologies that are equitable to all source categories. It is not equitable to point sources to have made significant reductions to meet technology limits, to have a second round of reductions from this TMDL, when it has not been shown or even explored in the analysis whether non-point source loadings have met their performance “requirements” within existing State statute.

There is insufficient detail on how allocations were developed and how allocations were “adjusted” and “modified” to consider downstream waters and controllable



sources. For example, on Page 84, “adjustments” were made to controllable source allocations to balance the modified facility allocation. There needs to be an appendix that includes details of these “adjustments” and “modifications” so there can be confidence the allocations are equitable, as noted in the justification of using the proportional allocation approach.

Installation of drain tile has been significant and experience in the Lower Fox River has shown that contribution from drain tile can be a significant loading to the watershed. The TMDL recognizes that drain tile contributes load but it does not appear to quantify it or require a reduction. SnapPlus also does not model drain tile for agricultural runoff. How is drain tile accounted for in the agricultural allocations and what will the State require for the agricultural sector to also reduce these sources of runoff within their allocations?

Including a margin of safety is a good practice for a process that has uncertainty, however understanding how the margin of safety assumptions individually and cumulatively impact the allocations is important to ensure assumptions are not overly conservative. The TMDL currently holds pounds of phosphorus that fall within the categories of margin of safety and reserve capacity that are not available to existing dischargers. These amounts should be specifically quantified in the TMDL.

We agree that a reserve capacity should not have a significant impact on allocations. However, the reserve capacity allocations should be specifically noted in the TMDL to be used by point sources, and not agricultural or other nonpoint sectors because they either have no mass discharge (e.g. CAFO) or they have significant contributions because implementation of existing regulations are not broadly enforced (agricultural runoff). The reserve capacity should be allocated to individual point source dischargers and the reserve capacity should be allowed to be utilized now, and not reserved for some future condition that will not likely be realized. Instead, allow the point source dischargers to use the reserve capacity now, and if additional allocations are needed in the future, make those available by modification to the point source allocations.

The TMDL should specify that if a wasteload allocation is retired, for example if a point source stops its discharge, the retired wasteload allocation would be distributed to the remaining point source dischargers.



Within Appendix K, Water Quality Trading, the example of local and downstream wasteload allocation is difficult to follow when comparing against Tables 1 and 2 for a specific facility. The Table headings are not the same as the example provided. Please provide an example using the headings in Tables 1 and 2. Please also explain why the facility's wasteload allocation is simply the subtraction between the "Local WLA" and "Downstream WLA".

Within Appendix K, Adaptive Management and Table 1, there are only six dischargers in six sub-basins that have an "Adaptive Management Target" above 40 ug/L, with all six being below the receiving water quality criterion of 75 ug/L.

- Please provide additional documentation on what these targets mean and why they can be so significantly lower than the receiving water's criterion and why all but six are below Lake Winnebago's criterion.
- The TMDL concluded that Lake Winnebago is controlling the upstream allocations, why would all but six upstream sub-basins need to reduce to below the Lake Winnebago criterion? There appears to be a bust in the math if 83 of the 89 sub-basins need to be well below the Lake Winnebago criterion.
- Achieving the "Adaptive Management Targets" within the facilities sub-basins will not be attainable and suggesting that it can be attained questions the validity of the models and modeling approach. These very low Adaptive Management Targets also show that all sub-basins are not opportunities for adaptive management. This does not make sense when nonpoint source loading dominates the TMDL area and heavily dominates most sub-basins

Implementation

The TMDL includes a nice summary of current programs that can contribute to reducing nonpoint source nutrient and sediment loading. However, the fact remains that the State is not implementing or enforcing their own regulations. The TMDL must include a summary of how the State, including DATCP and DNR, will implement and enforce existing regulations and how the State will fund and offer cost share so that regulations can be implemented. This summary should include how the implementation is different than current implementation strategies and how the proposed implementation will



improve sediment and nutrient reductions more quickly than current efforts. The summary should also include a schedule with mass reductions targets so that those can be compared against timelines applied to point sources. This should not wait until the post-TMDL implementation plan because this information is needed now for point sources to evaluate trading and adaptive management compliance options.

At the July 2018 stakeholder information meeting, DNR commented that additional requirements for implementation of NR 151 would need to be promulgated through NR 151.004. This is required by NR151.004 and NR151.005 because the modeling has shown that existing NR 151 regulations will not attain water quality and TMDL reductions below the existing NR151 performance standard will not attain water quality. Appendix J demonstrates that the majority of agricultural lands may already be significantly below the NR151 performance requirements of a PI=6, where TMDL reductions impart further reductions. Because NR151.005 requires a rule be promulgated under NR151.004 for the TMDL reductions to become a requirement for nonpoint loadings, when will DNR be promulgating a rule to require nonpoint source reductions?

Phased TMDL or Staged Implementation

The City had discussed with the TMDL team an approach for developing the TMDL with interim milestones and phased, adaptive implementation. The City believes that interim milestones and wasteload allocations could be included in the TMDL to recognize a phased or staged approach and to allow the TMDL to be implemented over time to allow for adaptive implementation of the TMDL. The adaptive implementation process would include initial load reductions and could be followed by monitoring and modeling, additional investigation of potential SSCs or UAAs, modifications to the TMDL if appropriate, and continuation of this cycle.

Without this phased or staged approach, point sources would be forced to meet "final" allocations in a very short timeframe compared to nonpoint sources, and anti-backsliding rules would apply to the point sources even if it is later found that a more moderate allocation would have been appropriate for them. Thus, without the phased or staged approach, the TMDL will not be equitable in its allocations, and most importantly, the TMDL will not be implementable within a timeline similar to what the City is held to in their permit.



Authority exists to implement phased TMDLs/staged implementation within the administrative code. During the discussions in 2016, the USEPA was supportive of a phased approach and there are other examples such as the East Branch of the DuPage River, Salt Creek dissolved oxygen TMDLs in Illinois and others in various other USEPA regions. It is important to note that USEPA has issued several guidance documents that discuss the permissible use of phased TMDLs and staged implementation. See *Guidance for Water Quality-Based Decisions: The TMDL Process*, Environmental Protection Agency (1991); *Memorandum: Clarification Regarding "Phased" Total Maximum Daily Loads*, Environmental Protection Agency (2006). In addition, the use of a phased approach for TMDLs has been acknowledged by the courts in various challenges to the TMDL process in those cases. See, e.g., *Natural Res. Defense Council v. Muszynski*, 268 F.3d 91 (2d Cir. 2001); *S. Appalachian Mountain Stewards v. Red River Coal Co., Inc.*, 2015 WL 1647965 (W.D. Virginia 2015).

The EPA guidance documents approve the use of a phased approach where, as is the case in the Upper Fox River basin, the City believes that the use of future data or improved analytical techniques will increase the accuracy of the load calculations necessary to achieve the appropriate water quality criteria.

Also related to this, the City was encouraged that macrophytes are included in the TMDL and agree that macrophytes can play a critical role in reducing suspended sediment and internal phosphorus loadings within in the pool lakes. An initial estimate of 25 percent reduction of internal loading was modeled and we believe that estimate might be low, especially given the history of the pool lakes with its high density of macrophytes. Additional factors will impact internal loading, such as carp and other invasive species. Implementing best management practices for reducing internal loading will require time and could have impact much greater than the assumed 25 percent reduction. A phased TMDL approach would support an adaptive strategy for implementing the TMDL in the pool lakes, and it should also include a scenario with greater reductions than 25 percent.

For all of the above reasons, we believe the suggested phased, adaptive implementation approach to the TMDL process for this basin is not only appropriate under the unique factual circumstances but also supported by applicable law and should be specifically provided for within the TMDL.

City Attorney

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Technical Comments Relating to the City's MS4 Obligation

Sawyer Creek Subbasin

The Upper Fox/Wolf River TMDL Hearing Draft document identifies a TSS Waste Load Allocation (WLA) to the City of Oshkosh MS4 system for the Sawyer Creek Subbasin (Subbasin 30). However, neither Sawyer Creek, nor any downstream waterbody, is listed as "impaired" for TSS or TSS related issues, on the 303(d) list. The TMDL provides no justification for assignment of a TSS WLA for the City of Oshkosh's MS4 system in Sawyer Creek. Please explain the rationale for this assignment of a TSS WLA to the Oshkosh MS4 system or remove the TSS WLA.

TMDL Approach to This Basin vs. Other Basins

MS4 existing pollutant loads (TSS and TP) and waste load allocations (WLAs) were calculated differently during the development of the Upper Fox/Wolf River Basins TMDL compared to all previous TMDLs in the state. Two examples include:

1. Using SWAT instead of WinSLAMM to generate MS4 pollutant loadings
2. Accounting for pollutant deposition in the streams and channels

The new and unique approach for MS4 pollutant load analysis, and how it will impact implementation approaches for MS4s, must be more clearly defined in the Upper Fox/Wolf River Basins TMDL document.

Standards That Are Not Achievable

The Upper Fox/Wolf River TMDL Hearing Draft document identifies an 83% reduction in Total Phosphorus (TP) for the City of Oshkosh MS4 for all four subbasins impacted by the MS4 system (See Appendix H, Table 5; page 13). The City of Oshkosh has conducted extensive city-wide stormwater pollution reduction analyses in accordance with WDNR procedures and policies in 2008 and 2014. Each of these planning documents evaluated the maximum level of pollution reduction achievable under extreme scenarios. The analyses found that even if 100% of the MS4 land area were treated with available management measures (an unrealistic assumption) the TP reduction targets of the Upper Fox/Wolf River TMDL Hearing Draft could not be

City Attorney

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achieved. With the adoption of this TMDL document, the WDNR is setting standards that are not technically, or financially attainable. The City of Oshkosh requests that the TMDL document be amended to acknowledge the fact that the MS4 TP targets cannot be attained through current, or foreseeable future management measures.


De Minimus Impact of MS4

The City of Oshkosh recognizes the nature of stormwater discharge and agricultural runoff as "diffuse pollution sources". However, in the case of the Upper Fox/Wolf River TMDL the disparity between the MS4 phosphorus discharge compared to the entire basin's agricultural sources is so enormous, that the TMDL should recognize this condition. The City of Oshkosh recommends that the TMDL document include this statement: "Even if all MS4 sources met their total phosphorus Waste Load Allocation, the net impact on the trophic condition of the Winnebago Pool Lakes would not be measurable and would fall within the margin of error of the TMDL modeling analysis."

The City is committed to continuing our aggressive stormwater pollution control program. However to rationalize the expenditures based on phosphorus control is misleading and not justified.

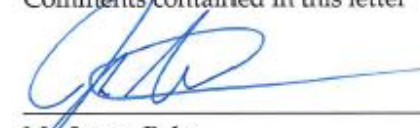
Thank you for your consideration of these comments. The City of Oshkosh looks forward to working with the DNR and other stakeholders to further reduce phosphorus and total suspended solid levels in the Upper Fox/Wolf River/Lake Winnebago basin.

The following signature is provided
in support of the Legal Comments
contained in this letter



Ms. Lynn Lorenson
City Attorney, City of Oshkosh

The following signature is provided
in support of the Technical
Comments contained in this letter



Mr. James Rabe
Director of Public Works, City of
Oshkosh



August 3, 2018

Mr. Keith A. Marquardt
Wisconsin Department of Natural Resources
625 East County Road Y, Suite 700
Oshkosh, WI 54901

**RE: Draft Upper Fox and Wolf Total Maximum Daily Load (TMDL)
Reports Comments**

Dear Mr. Marquardt:

Thank you for the opportunity to comment on the July 2018 draft TMDL Reports. These comments are submitted on behalf of the City of Oshkosh (the "City").

We understand the City of Fond du Lac has filed technical comments on August 2, 2018, a copy of which is attached hereto. Please be advised the City of Oshkosh joins in the City of Fond du Lac's August 2nd comments for the record in this matter.

Also, the City of Oshkosh, along with the City of Fond du Lac, have filed numerous written comments in the record of this matter including, but limited to, the following:

- Position Statement in support of the requests by the cities of Oshkosh and Fond du Lac for the Wisconsin Department of Natural Resources (WDNR) to conduct standards attainability evaluation for the Upper Fox/Lake Winnebago basin dated June 30, 2014;
- Technical comments of the cities of Oshkosh and Fond du Lac relating to the TMDL modeling for Lake Winnebago and the Pool Lakes dated April 23, 2015;
- Comments from the cities of Oshkosh and Fond du Lac following technical discussion related to lake modeling and its support of the Lake Winnebago TMDL on May 28, 2015;

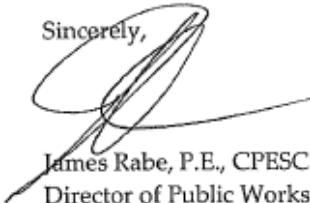
- City of Oshkosh comments to the SWAT and WiLMS models draft report dated October 28, 2016;
- Comments of City of Fond du Lac to the Upper Fox River and Wolf River TMDL public comments on draft SWAT and WiLMS models presentations and reports dated November 4, 2016; and
- Joint comments of the cities of Fond du Lac and Oshkosh on the Upper Fox/Wolf River TMDL meetings held on August 23 and 28, 2017, dated November 17, 2017.

Please be advised that we re-incorporate by reference these technical comments, many of which were unsatisfactorily addressed by the WDNR. For this reason, we are re-incorporating them by reference as part of the formal comments in the record in this proceeding.

Of course, if you have any questions, please feel free to contact the undersigned at your convenience.

Thank you for the opportunity to provide input to this very important TMDL process.

Sincerely,



James Rabe, P.E., CPESC
Director of Public Works

JR/tt

Enclosure



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Madison, WI 53715
(P) 608-251-4843
(F) 608-251-8855

August 2, 2018

Mr. Keith A. Marquardt
Wisconsin Department of Natural Resources
625 East County Road Y, Suite 700
Oshkosh, WI 54901

Re: Draft Upper Fox and Wolf Total Maximum Daily Load (TMDL) Report Comments

Dear Mr. Marquardt:

Thank you for this opportunity to comment on the July 2018 draft TMDL Report. These comments are submitted on behalf of the City of Fond du Lac (City).

1. **Macrophyte Restoration.**

We appreciate the Wisconsin Department of Natural Resources' (WDNR's) attempt to find a more balanced approach to this TMDL by including reductions in Lake Winnebago internal loading prior to making allocations. One of the proposed approaches assumes macrophyte restoration to reduce wind-driven sediment suspension. We understand that future TMDL report revisions will include additional information on this concept. We suggest the TMDL report include a discussion of potential associated water quality trades available to point sources. Will stringent credit thresholds and trade ratios apply to in-lake macrophyte restoration practices? It would be helpful to the macrophyte restoration effort if the WDNR would detail a streamlined approach to water quality trading (WQT) in the TMDL Report because the current Wisconsin guidelines make WQT onerous in many cases.

2. **Historic Total Phosphorus Concentration**

The paleoecological study results suggest that the total phosphorus (TP) concentration in Lake Winnebago was at or above the water quality criterion of 40 micrograms per liter (ug/L) prior to anthropogenic development in the area (1310 to 1725). Based on this data, we do not believe that the 40 ug/L criterion is appropriate or attainable, considering that this would require all phosphorus sources to be lower than the naturally occurring "background" sources from the 1300s. It would be impossible to completely reverse anthropogenic impacts, considering the extensive development and construction of dams that occurred since 1725.

In Section 2.4.2 of the draft TMDL Report, it states that the lake phosphorus model was used with tributary concentrations set to 20 ug/L TP to simulate conditions prior to extensive anthropogenic development in the watershed. This was then used in the pool lake modeling to suggest that the historic Lake Winnebago TP concentration could have been below 40 ug/L. Please provide additional information to support the tributary TP concentrations used in this analysis. The diatom analysis indicates that the Lake Winnebago TP concentration was higher than the lake model predicted under these conditions, suggesting that the tributary concentrations were greater than 20 ug/L prior to extensive settlement, or that another parameter in the model needs to be adjusted to accurately predict Lake Winnebago TP concentrations.

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Section 2.4.3 of the draft TMDL Report presents a regression analysis indicating water column TP concentrations of 35 to 47 ug/L should result in meeting the recreational use target of 20 ug/L chlorophyll (CHL) 70 percent of the summer days in Lake Winnebago. We have questions about the way the analysis was done and would appreciate additional explanation in the TMDL Report. However, our biggest question relates to the 20 ug/L CHL target. We understand this target is not codified and is based on surveys of user perceptions in Minnesota. Lake Winnebago is unique, and its users likely have different perceptions than a typical Minnesota lake user. The TP concentrations that were determined from this analysis coincide fairly closely with the pre-development sediment core results; does this mean the lake was at 20 ug/L CHL 70 percent of summer days back in 1310-1725? Again, we do not believe these historical TP concentrations are attainable considering anthropogenic development.

3. Uncontrollable Sources of Phosphorus

We have previously submitted comments stating that we believe TP loadings from forest and wetland (defined as “uncontrollable” sources in the TMDL Report) can be reduced through implementation of best management practices (BMPs). Regardless of what Dane County is doing in streams, sediments can be dredged from wetlands, wetland plants can be harvested, gully erosion in forested areas can be corrected, and so on. Background load reductions are inherent in the TMDL’s suggestion that Lake Winnebago TP concentration can be reduced to a value lower than the pre-anthropogenic development concentration identified in the paleoecological study. We request that the agencies add language to the TMDL Report stating that background sources were considered uncontrollable for purposes of setting load and wasteload allocations, but that this definition is not intended to prohibit trading with these sources.

4. Nonpoint Source Reductions

Nonpoint sources will not be required to reduce TP loadings as a result of this TMDL. Nonpoint sources will, however, need to reduce loadings significantly for the TP criterion in Lake Winnebago to be met. We believe it is unlikely that nonpoint sources will make meaningful reductions that will lead to improvements in water quality, especially without a significant increase in cost-sharing funding. Wisconsin Admin Code § NR 217.16 allows TMDL-based limits to be used in Wisconsin Pollutant Discharge Elimination System (WPDES) permits for two or possibly three permit terms if nonpoint source loads have been substantially reduced. NR 212.76, on the other hand, simply says TMDL-based water quality based effluent limits (WQBELs) can be included in permits in lieu of or in addition to other WQBELs. The WDNR should provide assurances that further reduction will not be demanded of point sources if the nonpoint source reductions are not met within the next 20 years.

The United States Geological Survey (USGS) pool lake modeling included several scenarios that are not mentioned in the TMDL report. We recall from the October 2016 meeting with United States Environmental Protection Agency (USEPA), WDNR, and USGS that the pool lake modeling showed if the Oshkosh and Fond du Lac treatment plant loads were set to zero, it would only reduce the Lake Winnebago TP concentration by 2 ug/L, from 90 ug/L to 88 ug/L. This change is so small that it is not reliably measurable. The TMDL report indicates that the municipal separate storm sewer systems (MS4s) have an even smaller impact. With this in mind, it is unreasonable to expect point sources to expend millions of dollars to make further load reductions until significant strides are made with nonpoint load reductions.

Mr. Keith A. Marquardt
Wisconsin Department of Natural Resources
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5. Phased TMDL

Finally, we would like to clarify one of our previous comments and apologize for the confusion. In the WDNR's May 15, 2018 response to the City's November 17, 2017 comments, the WDNR responded to our suggestion for a phased or staged TMDL by noting that the DuPage River and Salt Creek TMDLs were for chlorides and total dissolved solids (TDS). However, we were referring to the 2004 Salt Creek and East Branch DuPage River TMDLs for dissolved oxygen. Illinois does have numeric water quality standards for dissolved oxygen. For these TMDLs, USEPA approved a phased, holistic approach with adaptive implementation, in lieu of placing more stringent ammonia and biochemical oxygen demand effluent limits in wastewater treatment facility permits. Additional information is available at the DuPage River Salt Creek Workgroup Web site (<http://drscw.org/wp/>) and on the Illinois Environmental Protection Agency (IEPA) TMDL report status page. Note that USEPA staff also stated in the October 2016 meeting that a phased or staged approach would be approvable for the Upper Fox Wolf TMDL as long as the TMDL included a roadmap for eventually meeting water quality criteria. We suggest that it would be possible to include both interim and final wasteload allocations in the TMDL report, along with the schedule and conditions under which the final wasteload allocations would go into effect, so that NR 217.13 limits do not go into effect in the meantime. We believe this would be an appropriate approach for many reasons, including the following: significant phosphorus load reductions have already been made by point source dischargers and making additional load reductions will come at a premium cost; point sources represent a small percentage of the total loading; there are many uncertainties related to the pool lake phosphorus criterion value and attainability; there is little assurance that nonpoint sources will reduce their loadings in a timely manner; and the internal lake TP loading is very high and will take decades to reduce.

Please let us know if you have any questions or would like us to suggest specific language to incorporate into the TMDL Report. Again, we appreciate the opportunity to submit these comments at this time. We will likely submit additional comments on the public notice draft TMDL Report during the public comment period. However, we hope that by submitting these comments now, there is more time for the agencies to seriously consider approaches that will make the TMDLs more effective and attainable.

Sincerely,

STRAND ASSOCIATES, INC.®



Jane M. Carlson, P.E., ENV SP



Nicholas A. Bartolerio, P.E.

c: Jordan Skiff, City of Fond du Lac
Cody Schoepke, City of Fond du Lac

Also, the City of Oshkosh, along with the City of Fond du Lac, have filed numerous written comments in the record of this matter including, but limited to, the following:

- a. Position Statement in support of the requests by the cities of Oshkosh and Fond du Lac for the Wisconsin Department of Natural Resources (WDNR) to conduct standards attainability evaluation for the Upper Fox/Lake Winnebago basin dated June 30, 2014;

Text of referenced comment included in Appendix N.

- b. Technical comments of the cities of Oshkosh and Fond du Lac relating to the TMDL modeling for Lake Winnebago and the Pool Lakes dated April 23, 2015;

Text of referenced comment included in Appendix N.

- c. Comments from the cities of Oshkosh and Fond du Lac following technical discussion related to lake modeling and its support of the Lake Winnebago TMDL on May 28, 2015;

Text of referenced comment included in Appendix N.

- d. City of Oshkosh comments to the SWAT and WiLMS models draft report dated October 28, 2016;



October 28, 2016

Mr. Keith Marquardt, Water Resources Management Specialist
Wisconsin Department of Natural Resources
625 E County Road Y
Suite 700
Oshkosh, WI 54901

RE: Comments to SWAT and WiLMS Models Draft Report

Dear Keith:

After the Upper Fox and Wolf River TMDL stakeholder meeting held on June 15, 2016, the TMDL team completed SWAT and WiLMS models draft reports ("Models"). In an e-mail dated August 30, 2016, you imposed a deadline date of October 28, 2016 for comments to the Models ("Deadline"). Please accept this letter as the City of Oshkosh's written comments to the Models.

At the outset of these comments, the City desires to clarify its understanding of the Department's invitation for comments on the Models and the Deadline. It is the City's understanding through your conversations and e-mail exchanges with the City's consultant, Brent Brown, you have agreed the City may submit further comments after the October 28, 2016 deadline to accommodate the recent meeting with USGS and the extended schedule of the City of Fond du Lac, as well as more generally. The City understands that this opportunity to comment on the Models before the Deadline does not foreclose the City from future opportunities to provide additional comments on the Models or on any other topic relating to the TMDL development process prior to the issuance of a final agency decision on the TMDL development ("Future Comments"). In addition, the filing of these comments, generally limited to the Models, does not waive the previous written comments filed by the City in this proceeding on numerous topics relating to the TMDL development process. It is the City's position that those previous written comments are all part of the record in this proceeding.

In the unlikely event the Department were to disagree with the City's understanding in these respects, the City specifically reserves its rights to rely on the past written comments, as well as to provide Future Comments, and the filing of these comments shall not be deemed to be a waiver of the City's rights relating to the record in this proceeding. Finally, the City's filing of comments on the Models shall not be viewed as a waiver of the City's position regarding the proper legal process that applies to the development of TMDLs for the Upper Fox and Wolf River watersheds by the Department.

Based upon these understandings as outlined above, the City appreciates the opportunity to provide these comments to the Models. The City sincerely hopes these comments will assist the Department in the development of the TMDL that will comport with appropriate technical and legal standards.

The SWAT and the WiLMS model tools were reviewed as the basis for generating watershed loads that will be used in lake models for the Lake Winnebago pool lake system for the development of a TMDL for total phosphorus and total suspended solids. Detailed comments for each report are included in the enclosed tables, organized sequentially by report section and page number. While specific concerns pertaining to sections of the reports are included in the enclosed tables, the City overall has significant concerns the TMDL will not accurately represent the diverse Upper Fox River/Lake Winnebago watershed and that documentation of critical decisions and data-grooming is insufficient, and to that end provides the following comments for your consideration:

- SWAT is a high-level model used to generate loading from relatively large sub-watershed areas. As such, the coarse scale and assumptions applied across the sub-watershed areas in a SWAT model are general and do not allow the model to reflect the specific conditions of the watershed.
- WiLMS is a simplified planning tool used to evaluate transport through the watershed based on inputs from the SWAT model. It does not have the refinement to be applied across the highly-diverse lakes present in the watershed. It is commonly recognized that for some lakes WiLMS is not an appropriate tool and, in this case in particular, the wide range of adjustment factors demonstrates its limitations.
- Both tools are useful for making preliminary assessments of watershed conditions and developing initial management strategies. Neither model – especially the WiLMS model – rise to the level of sophistication and development appropriate for development of a TMDL. The WiLMS documentation shows a lack of supporting water quality data and a wide range of non-systemized adjustments used in an attempt to match the data.
- The WiLMS tool is a high-level planning tool that is based on limited water quality data in many areas. It is useful for getting a sense of total phosphorus movement in the Upper Fox-Wolf Basins and to develop some initial water quality management

strategies, but should not be used as the basis for developing a TMDL. The tool uses inputs from the SWAT model (see enclosed comments) and includes adjustment factors – over a wide range – in an attempt to make the tool generally match existing data. It lacks sufficient supporting water quality data and a rigorous empirical basis for use in developing a TMDL with the supporting wasteload allocations, load allocations and safety factor. It may be useful in establishing some initial phosphorus management strategies, in conjunction with stakeholders, which can be implemented in combination with more intensive and targeted monitoring programs.

- Planning of the TMDL was to be consistent with the Wisconsin River TMDL, but the reports contain no mention of how the models and approaches overlap and are consistent, or documentation of why they are not.
- No water quality data, maps, or statistics are presented to demonstrate that available data is sufficient and acceptable, or that data grooming was appropriate for averaging calculations used for model calibration and validation.
- Very limited information was presented regarding nonpoint source agricultural information such as crop rotations, soil phosphorus, nutrient placement rates and techniques, farming and nutrient management practices. This information should exist in good detail from County conservation departments, but no data or technical memorandum has been included in the reports. Only a general and limited summary was included. Because the agricultural data exists, the Counties are mandated to maintain it, and nutrient management plans are reported to be highly prevalent in the watershed, detailed reporting on agricultural practices should be included in the TMDL modeling and documentation.
- The Quality Assurance Project Plan (QAPP) was not referenced within either the SWAT or WiLMS draft reports. Both reports should document how the elements of the QAPP are satisfied. For example, in referencing the R-square, NSCE and p-bias modeling calibration and validation, the QAPP (Section A7, Page 21) says "...it may not be possible to achieve target values... if such condition occurs... reasoning will be provided to justify the validity of the model." Reasoning was not provided, the errors in the draft reports were not consistent with the QAPP, and errors appeared to be acceptable for modeling without explanation. In addition, the QAPP did not include the WiLMS models, so the QAPP should be updated or, at a minimum, the QAPP elements should be documented within the WiLMS report, along with how the WiLMS report satisfied the QAPP requirements.

While not quantified in the reports, but documented in stakeholder meeting presentations of the pool lake system, the Lake Winnebago watershed has a predominance of loading from nonpoint sources. It is undetermined the extent to which loading from these nonpoint sources can or will be reduced, especially given Wisconsin's long history of strong agricultural management programs. Proceeding with a TMDL with these coarse tools at this time will result, as in many places across the U.S., in significant reductions in point source loading – at a high cost – without a strong basis for understanding whether these reductions will begin to approach attainment of the water quality standard.

A more appropriate approach is to use this information as a guide to the development of an initial water quality management strategy in conjunction with stakeholders – including an appropriate technological approach for total phosphorus removal from point sources – and then proceed with more watershed data collection to support refinement and/or development of more detailed tools. This information can be used to target nonpoint source management programs and may also be useful in determining whether current water quality standards are attainable and/or whether an appropriate site specific standard should be pursued.

Based on the QAPP and communication from the TMDL team at the June 2016 stakeholder meeting, the SWAT model output will be used in the pool lake model, a similar approach to how the WiLMS model uses SWAT output. If the SWAT model output is used as input for the pool lakes, it is even more critical for the SWAT model to be representative of the watershed. Because of the cascading effects of assumptions and validation of the SWAT model, it is imperative the SWAT model be based on sufficient data, spatial and temporal scale, and that calibration and validation be of great confidence rather than simply "satisfactory".

The City has appreciated the TMDL team's discussions regarding the pool lake modeling. However, without a pool lake model to review with the SWAT and WiLMS models, review of the TMDL modeling approach is challenging because the models cannot be viewed as a system. It is unclear how the three systems will be integrated together, and calibrated/validated as a system versus independent models. We are concerned allocations will be developed and presented without opportunity to review the pool lake draft report in similar fashion as the WiLMS and SWAT draft reports. In reviewing the project schedule on the TMDL website, there is no mention of providing a pool lake modeling report. Instead, draft allocations and a TMDL report will be developed after this comment period. While the TMDL team has provided opportunity for discussion about the pool lake models, we are concerned sufficient reporting will not be provided before the draft TMDL report is issued.

Sufficient water quality data is always a challenge of TMDLs; however, there appears to be drastic differences in the amount of water quality data for this TMDL compared to the adjacent Wisconsin River TMDL. The Lake Winnebago TMDL may have a dozen data points; the Wisconsin River TMDL has hundreds of data points. Over the past two years, the City has offered to assist the TMDL team with ensuring sufficient data is collected for the TMDL, including sediment cores and diatom analysis. We are concerned the diversity of the watershed, and site specific conditions of the watershed, its lakes, and the pool lakes, are not being sufficiently represented to develop a TMDL with billion dollar ramifications. The cost of ensuring robust, comprehensive, and representative water quality data and the corresponding TMDL is insignificant to the implementation cost of the TMDL.

Sincerely,



Stephan M. Brand
Public Works Utilities Bureau Manager

SMB/tjt

Enclosure: SWAT and WiLMS Models Draft Reports Comments

Document: SWAT Model Setup, Calibration, and Validation
 Report Date: 7/27/2016

Comment	Location Reference (page-section#-paragraph)	Comment
1	General	While it's recognized that simulating such a larger basin is challenging, the coarse spatial and temporal scale used for the SWAT model is concerning. A wide variety of critical processes will be generalized and their impacts lost.
2	p1 - Sec 1	Lake Winnebago and its direct subwatersheds and HRUs are not mentioned in the SWAT memo. Update analysis to address how these areas are being accounted and integrated into the model.
3	p1 - Sec 1	Describe how SWAT will be used in the TMDL process. It is not clear how SWAT fits in with the work plan or process of the TMDL.
4	p1 - Sec 2.1 - 1st paragraph	Provide details on average and range of catchment areas. The threshold value only provides a basis for determining subwatershed size.
5	p1 - Sec 2.1 - 1st paragraph	Modeling subwatersheds of 25 mi ² or greater is likely to generalize hydrologic processes which control runoff volume and timing.
6	p1 - Sec 2.1 - 1st paragraph	How will SWAT subwatersheds relate to "TMDL reaches" where TMDL reaches have carried significant regulatory meaning? The TMDL needs to include consistent nomenclature throughout so that implementation does not face the same challenges of other TMDLs with similar inconsistencies.
7	p1 - Sec 2.1 - 1st paragraph and Figure 1	Include in an appendix detailed maps of subwatersheds so that subwatershed boundaries can be understood based on hydrologic and municipal boundaries. Figure 1 is not a sufficient map.
8	p1 - Sec 2.1 - 2nd paragraph	As noted, SWAT uses one reach per subwatershed. This is problematic for simulation of sediment and phosphorus since significant sediment trapping and phosphorus utilization occurs in the tributaries, smaller feeder streams, and headwater wetland/stream complexes not shown in the model.
9	p3 - Sec 2.2.1 - 1st paragraph	Was crop rotation information obtained from nutrient management plans submitted to the State? If they were obtained by the nutrient management plans, were they taken from <u>actual</u> plans submitted in the Fall or from <u>planned</u> documents that are submitted in Spring? There can be significant differences in this data and <u>actual</u> plans should be used and not <u>planned</u> conditions. This information should be summarized in a detailed appendix and not simply reported as "a crop rotation map layer was developed". This is a critical part of the SWAT analysis.
10	p3 - Sec 2.2.1 - 1st paragraph	Why was the 2006 NLCD dataset used instead of the 2011 USDA National Agricultural Statistics Service (NASS) dataset? It's difficult to tell how closely the land use development followed the <i>Land Cover and Agricultural Management Definition within the Upper Wisconsin River Basin</i> methodology. This method seemed to rely only on the NLCD for urban areas and followed a detailed methodology for the agricultural land.
11	p3 - Sec 2.2.1 - bullet 2	Should City of Appleton be City of Dshkosh?
12	p3 - Sec 2.2.1 - bullet 3	Pasture and grasslands can be managed very differently and have significant differences in soil P and soil and phosphorus loss. If grasslands is meant to be "managed grazing" areas, grassland agriculture needs to be a separate land cover class. There can be significant grassland land uses in the watershed through conservation easements, pollinator land cover, whole field conversions to native grasses. This is demonstrated by NRCS's consistent 100% satisfaction of conservation easement cost sharing applications.
13	p3 - Sec 2.2.1 - bullet 3	How were barnyard and outlot land covers accounted for?
14	p3 - Sec 2.2.1 - bullet 4	Is fertilizer meant to include manure? Use of the word "fertilizer" suggests only synthetic fertilizer. Suggest considering using "nutrient" instead, if manure is incorporated.
15	p5 - Sec 2.2.2	How was bedrock accounted for?
16	p5 - Sec 2.2.3	All counties in the watershed have DEMs based on LiDAR data. Best available data should be used to allow for more accurate modeling, especially to capture the variety of slopes in the watershed.
17	p5 - Sec 2.2.3	The slope ranges are very large. Why not include a range that captures the average instead of the average defining the end of a range. Statistics could help determine the range but consider: 0-1.5%; 1.5-4.5; 4.5-7, 7-10, >10.
18	p5 - Sec 2.2.4 - 2nd paragraph	How does the minimum area thresholds and the resulting 8,290 HRUs compared to other TMDLs, such as the Wisconsin River TMDL?
19	p6 - Sec 2.3	Information in Table 3 should also be shown in a map(s) with the watershed boundary, waterbodies and municipal boundaries.
20	p6 - Sec 2.4 - 1st paragraph	Point source loadings were based on annual averages. Why weren't monthly discharge monitoring records used to better quantify the discharges? If there were too many point sources to characterize, could a subset be used to develop a flow and pollutant pattern? There is likely to significant seasonal variability in the discharges. Data and summaries should be included as a memorandum in an appendix.

Document: SWAT Model Setup, Calibration, and Validation
 Report Date: 7/27/2016

Comment	Location Reference (page-section#-paragraph)	Comment
21	p6 - Sec 2.4 - 2nd paragraph	It is assumed that point source phosphorus is 100 percent soluble. This is a poor assumption and will affect phosphorus loss due to settling. Point source monitoring data, information from basin point sources, or literature data should be compiled to develop a more realistic estimate of speciation. Most (if not all) WWTPs have detailed information on phosphorus speciation as part of the DNR required optimization testing.
22	p6 - Sec 2.4 - 2nd paragraph	The report states "The designation of point source loads as soluble phosphorus versus organic phosphorus was found to have a negligible influence on total phosphorus predictions." This suggests that the model is not reflecting sedimentation and uptake that is likely to occur.
23	p10 - Sec 2.5	Need a summary memo for each County and UW in the appendix to document process and results of determining soil P. Just reporting the result is not sufficient. The process needs to be part of the documentation. Since all this information is part of Nutrient Management Plans, nothing short of analyzing the plans for the specific areas of the TMDL should be acceptable.
24	p10 - Sec 2.5	Instead of applying to HUC12, why isn't the soil P applied to a finer scale at HRU scale? This information exists in nutrient management plans.
25	p10 - Sec 2.5	Were the soil P values applied the same to forest and wetlands, or just Ag lands? What were the soil P values used for each land use?
26	p10 - Sec 2.5	The report states "Other counties were not able to provide information on soil P". This is not acceptable - the counties are mandated by the State to implement and enforce nutrient management plan requirements, NR 151 and NRCS 590. This should be one of the best known pieces of information. It is acknowledged that it may require review of many paper-submitted nutrient management plans, but this should be a minimum requirement for developing the SWAT model.
27	p10 - Sec 2.5	The report states "soil concentrations were therefore assumed to be 50% soluble and 50% organic P". If this is a known input for SWAT, this information should be tested. What is used in the Wisconsin River TMDL?
28	p11 - Table 5	Are the single soil P values for Adams, Calumet, Columbia, Dodge, Langlade, Marathon, Marquette, Menominee, Oconto, Oneida, Portage, Shawano, and Waupaca Counties applied across the entire county? More detailed information should be available through nutrient management plans. Some of these counties have very progressive LWCDs and NRCS offices that have this information.
29	p11 - Table 5	How is the soil P applied over the 1999-2013 timeframe of model calibration and validation? Nutrient management has not been static over this time.
30	p11 - Table 5	Soil P values from Fond du Lac, Green Lake, Outagamie, and Winnebago counties appear to have some analysis behind them. Document <u>how</u> these values were calculated in an appendix, including the raw data that was used.
31	p12 & 13 - Table 5	The soil P values for Waushara County are very round. How were these calculated?
32	p12 & 13 - Table 5	There are several HUC12 and County avg soil P values greater than 100. This exceeds regulatory standards and would typically include significant nutrient restrictions on a farmer if they had this <u>average</u> value. How were these values calculated? If this is an average value, what are the ranges of soil P?
33	p14 - Table 6	Information in Table 6 should also be shown in a map(s) with the watershed boundary, waterbodies and municipal boundaries.
34	p14 - Table 6	Some of the stream gages period of record were decades before the calibration/validation periods. How were these data used when they were not in the range?
35	p14 - Sec 2.7	Why wasn't LIDAR DEMs used for calculating internally drained areas? DNR's EVAAL tool used LIDAR and calculates these features. Why not use this tool that exists within the State?
36	p15 - Sec 2.8 - Last sentences	What is the justification for the wetland surface area and depth multipliers?
37	p16 - Table 7	What is the source of this table? Is this consistent with other TMDLs, such as Wisconsin River? This range seems to underestimate manning's-n for low percentages and overestimate for high percentages.
38	p16 - Sec 2.10 - 1st paragraph	Good that a correction factor is applied to the slope length factor. How does this compare to the Wisconsin River TMDL and Rock River TMDL when this slope length correction was developed for the Lower Fox River?
39	p17 - Sec 3 - 2nd paragraph	What is the criteria for "sufficiently matched observed data" and how was the criteria established?
40	p17 - Sec 3 - Bullet List	What is the performance criteria for R-squared?
41	p19 - Sec 4 - 1st paragraph	Why were daily data not included in the calibration? The same calibration metrics do not need to be applied but at least a graphical comparison of the simulated and observed daily data would be useful in assessing the range and baseflow response of the model.

Document: SWAT Model Setup, Calibration, and Validation
 Report Date: 7/27/2016

Comment	Location Reference (page-section#-paragraph)	Comment
42	p19 - Sec 4.1	It would be helpful to have a map showing all stream flow gages and also showing those that were used.
43	p19 - Sec 4.1 - 1st paragraph	Why were records removed if less than 2 years? If the data is of sufficient quality, it should be used to refine the model.
44	p19 - Sec 4.1 - 2nd paragraph	The report says that the Swamp Creek and White Creek gages were not used since they "appear to drain watersheds with uncharacteristically high groundwater discharge." Shouldn't they be included and the information be used to refine model for areas with high baseflow? Dropping them would end up neglecting baseflow contributions and result in underestimation of flow.
45	p19 - Sec 4.2	Need tables and graphs showing (not summarizing) all data used. Include as an appendix if necessary.
46	p19 - Sect 4.2 - 1st paragraph	Was DNR SWIMs data used for water quality data? If not, why?
47	p19 - Sect 4.2 - 1st paragraph	Why exclude White Creek data due to high discharge? Was it wrong? This is a watershed characteristic and should be accounted for.
48	p19 - Sec 4.2 - 2nd paragraph	Provide documentation of personal communication, including raw data graph and tables.
49	p20 - Sec 4.2 - 2nd paragraph	The amount of water quality data appears to be very limited. This is concerning considering this is a water quality TMDL. Only 3 sites had more than 5 years of data.
50	p20 - Sec 4.3	What does it mean to "survey" county-wide crop yields? What QC is involved aside from a conversation? Provide documentation in a memorandum as an appendix.
51	p21 - Table 8	Include total # of samples and total # of approved samples for sediment and phosphorus in the date ranges used for calibration and validation.
52	p21 - Table 8	Provide data in tabular and graphical form. There is no raw data presented, only monthly averages in later charts. An appendix should include all data shown in tabular and graphical form.
53	p23 - Table 10	How can validation years be used when there is no calibration years for Waukau Creek and Silver Creek?
54	p24 - Sec 5.1	Validation was not mentioned in the report for crop yield and plant growth. How was validation completed?
55	p24 - Section 5.1	Was an annual flow volume comparison done for each gage? Many of the plots suggest the model is over or under predicting flow. A model running on a daily step should be able to predict annual flow within +/-10 percent.
56	p24 - Sec 5.1 - 2nd paragraph	Switching from Bermuda grass to alfalfa may improve biomass match but what impact does that have on runoff quality and quantity? Pasture/grassland has the second highest land cover class in the watershed at 18% (see Table 2 on p4). With this large fraction of land, a small unit impact could have large impacts on the watershed model.
57	p24 - Sec 5.1 - 3rd paragraph	Switching from Bermuda grass to Kentucky bluegrass for urban/developed was reported to better match biomass outputs. What impact on runoff quality and quantity does this have?
58	p24 - Sec 5.1 - Table 11	Is potato/vegetable missing?
59	p24 - Sec 5.1 - Table 11	Update Table to include yearly crop yield comparisons from NASS and SWAT.
60	p25 - Sec 5.2 - 1st paragraph	How was drain tile accounted for?
61	p25 - Sec 5.2 - 4th paragraph	The modeling used two values of SURLAG based on drainage area. The split seems somewhat arbitrary and the SURLAG are significantly different for the two. Would a more graduated approach be more realistic?
62	p26 - Table 13	Please explain why you believe the calibrated Alpha_BF factors were significantly higher than the values calculated for all the basins.
63	p26 - Table 13	The values for GWQMN and GW_REVAP were changed significantly from the defaults. What is the basis for these large adjustments?
64	p27 - Sec 5.2 - 1st paragraph	The report stated that calibration was good to very good. This is not correct. Ten were satisfactory (or less) and seven were good or very good. Less than half were better than satisfactory. Why is good or very good not the requirement for each gage?
65	p27 - Table 14	The Silver Creek gage was less than satisfactory for both NSE and PBIAS. How is this acceptable or what is the plan for use of this data?
66	p27 - Table 14 and Table 15	The statistics for most of the flow estimates show at least satisfactory agreement. A review of the calibration plots, however, show significant variation on a monthly basis for many of the stations. These differences can have a large effect on the ability of the model to be useful as inputs to a lake model.

Document: SWAT Model Setup, Calibration, and Validation
 Report Date: 7/27/2016

Comment	Location Reference (page-section#-paragraph)	Comment
67	p28 - Sec 5.3 - 4th paragraph	Were the manning-n values validated with any field work? Did the values, or do they in the SWAT model, vary across HRUs or are they the same everywhere? Provide a table summarizing manning-n values used in the model and their locations of use.
68	p28 - Sec 5.3 - 5th paragraph	Were main channel widths field verified to validate that they appeared unrealistically high? The 50% reduction in channel width seems large and arbitrary. How was this decision validated?
69	p28 - Sec 5.3 - 6th paragraph	What factors led to the decision to increase the channel erosion parameters?
70	p30 - Table 17 and Table 18	The statistics for sediment show at least satisfactory agreement. A review of the calibration plots, however, show significant variation on a monthly basis for many of the stations. A number of the stations show poor agreement for many periods with the difference in loading sometimes exceeding 100 percent.
71	p32 - Table 20 and Table 21	The statistics for total phosphorus show at least satisfactory agreement. A review of the calibration plots, however, show significant variation on a monthly basis for many of the stations. A number of the stations show poor agreement for many periods with the difference in loading sometimes exceeding 100 percent. A comparison of an annual estimated and measured TP should be performed.
72	p33 - Sec 6 - 1st paragraph	The second sentence in the opening paragraph of the Discussion and conclusions is disturbing to a regulated entity that the TMDL accepts statistics that are below guidelines. The TMDL should not proceed with a TMDL unless it is within guidelines. What is the plan of the TMDL team to improve this TMDL so all data and analysis meet performance guidelines?
73	p34 - Sec 6 - 1st paragraph	The last sentence describes how better calibration can be achieved by collecting additional data and completing further calibration runs and parameter adjustments. The Cities fully support this and this should be required. Please explain how this will be accomplished?
74	p34 - Sec 6 - first bullet group	The SWAT model is generating <u>annual</u> statistics that are reported to be used in the TMDL and allocations. Why isn't more frequent reporting completed to support the <u>monthly</u> allocations that are expected from this TMDL?
75	p34 - Sec 6 - second bullet group - 1st bullet	Additional weather data was noted as valuable data to improve the model and it will be used "if available". Is additional weather data available?
76	p34 - Sec 6 - second bullet group - 2nd bullet	Why weren't errors in observed stream flow data taken into consideration? Could this explain some of the stream flow errors and poor calibration?
77	p36 - Appendix A - General	Was survey for the same time period as the SWAT model, 2000-2013?
78	p36 - Appendix A - General	How were CAFOs included in the survey information since they have performance requirements that are different than non-CAFOs?
79	p36 - Appendix A - 2nd paragraph	Include the questionnaire and the answers to the questionnaire in an appendix. Include a memo summarizing the results and document any gaps that exist after questionnaires completed by the Counties.
80	p36 - Appendix A - 2nd paragraph	The questionnaires were reported to "reasonably" capture spatial variations. What is the spatial variation and how is "reasonably" defined?
81	p36 - Appendix A - 2nd paragraph	Questionnaires were sent to County LWCDs. Was NRCS, DATCP, or private agronomists who work with farmers in the watershed consulted?
82	p36 - Appendix A - 2nd group of bullets, second to last bullet	Private agronomists in the watershed report average manure applications of 12,000 to 15,000 gallons per acre.
83	p37 - Appendix A - 3rd paragraph	The report states that selected classes "do balance" variability in farming practices. Summarize the data that validates this position.
84	p39 - Appendix A - Table A-2	Why is there no manure application in these scenarios?
85	p39 - Appendix A - Bullet #2	The WDNR reference for agricultural classes across the State is from the Wisconsin River watershed. What is the reference for determining agricultural classes in the Upper Fox and Wolf River watershed?
86	p39 - Appendix A - Bullet #4	Include the questionnaire and the answers to the questionnaire in an appendix. Include a memo summarizing the results and document any gaps that exist after questionnaires completed by the Counties.
87	p40 - Appendix B - General	How were the management tables developed and how were they validated against nutrient management plans? Include a memo as an appendix detailing how the scenarios were developed, validated, and applied to the land use.
88	Appendix B - Tables	What does "25" mean in the month column of the tables?
89	Appendix B - Tables	Why are the annual manure volumes different between daily haul and storage scenarios?
90	Appendix B - Tables	Explain the daily haul manure volumes that are consecutive months of the same volume.

Comment	Location Reference (page-section#-paragraph)	Comment
91	Appendix B - Tables	Tillage residue is measured after planting, not over winter but tillage between Dairy 1 and 3 immediately preceding planting is the same. When is tillage residue goal expected in SWAT model?
92	p42 - Appendix B - Tables B-1 and B-3	Tillage in these two tables are the same for times immediately before planting, which would have the most significant impact on residue. How can tillage be the same but the residue assumptions between these scenarios are different. This happens several times on Appendix B Tables.
93	p61-84 - Appendixes D-F	There are several significant differences in observed versus simulated flow and water quality data. Discussion on each graph for its validation is needed. In some cases, trends are very different (observed is increasing while simulated is decreasing - for example Figure D-5) and peaks are greater than 100% different (examples such as Figure D-14, D-17, D-25, E-1, E-5, F-5, F-6). In some graphs, like Figure E-1, the streamflow was sediment so it is not clear why the sediment load would be so different when the model suggested it was "good" calibration and validation for NSE and PBIAS factors.

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Comment	Location Reference (page-section#-paragraph)	Comment
1	General	The WILMS model uses a very simplified approach which neglects key processes such sediment release and stratification.
2	p1 - Sec 1 - 2nd paragraph and Table 1	WILMS modeling was reported to be completed for phosphorus, however not all lakes have a pollutant impairment for phosphorus. For example, Buffalo Lake has pollutants causing impairments from Mercury and PCBs, not phosphorus or TSS. Are phosphorus and TSS allocations provided for all listed lakes, regardless if their pollutant of impairment is TSS or phosphorus?
3	p1 - Sec 1	The introduction should include a description of how the WILMS modeling fits within the TMDL. It should also summarize how is WILMS going to be used in the TMDL process, what are its limitations, how are those limitations addressed, what role WILMS plays with SWAT modeling, what role WILMS plays with Bathub/Jensen Lake Modeling, what role WILMS plays in setting allocations.
4	p1 - Sec 1	What role did USGS have in the WILMS modeling?
5	General	Please include a summary of the QA and QC procedures that were completed for the WILMS modeling.
6	General	Include a series of maps showing the locations of the lakes and their watersheds, similar to that shown in Figure 1.
7	p2 - Sec 2 - 1st paragraph	The WILMS model assumes that the lakes are all zero dimensional and completely mixed. While this may be appropriate for small, shallow lakes it would not be appropriate for very deep lakes, e.g. Green Lake, or large lakes, e.g. Shawano Lake.
8	p2 - Sec 2 and p6 Table 2	The lakes summarized in Table 2 are a very diverse set of lakes. Some, like Big Green Lake are medium sized and very deep, with Big Green Lake being the deepest inland lake in the state with a maximum depth around 240 feet and a mean depth of around 100 feet. Compared to Puckaway lake that has a maximum depth of 5 feet and a mean depth of 3 feet. Please summarize the monitored lake data for each lake that was used to validate the three assumptions listed in the report. As one example, summarize the lake monitoring data that verified that each lake is a completely-mixed body of water with no horizontal or vertical variability in water quality.
9	p2 - Sec 2 - last paragraph	Provide output data and graphs that summarize validation that Cadmus-updated Excel files resulted in the same results as the standalone software program. Include all output used for this validation.
10	Section 3 - General	What is the acceptable error for modeling validation? How does this compare with other TMDLs in Region 5, specifically the adjacent Wisconsin River TMDL? How does the error compare with the water quality standard for each lake? Demonstrate through tabular data and graphs how each lake and model achieves these acceptable error standards.
11	p3 - Sec 3.2 - 1st paragraph	The model uses SWAT model results as inputs. As noted in the SWAT comments, at a minimum the total water balance for the SWAT model should be checked and verified that it is within 10 percent of measured flow.
12	p3 - Sec 3.2 - 1st paragraph	The model uses SWAT model results as inputs. As noted in the SWAT comments, the accuracy of the TP loading is questionable. Annual SWAT TP results should be verified.
13	p4 - Sec 3.2 - last paragraph	Precipitation to lake surface is accounted for in WILMS. How is groundwater inflow accounted for each lake given that some lakes have significant differences in ground water or spring contribution. For example, Big Green Lake has high groundwater rates given it's spring fed and the deepest inland lake in the state with depth around 240 feet. This would be very different to a small shallow lake like Old Taylor Lake.
14	p4-5 - Sec 3.3	The groundwater phosphorus loading focuses entirely on septic tanks, however the watershed is dominated by agriculture. How is groundwater loading from other sources, such as agriculture, accounted for for loading to the lakes?
15	p5 - Sec 3.2 - 1st paragraph	How was the 0.8 kg/person/year verified for the 21 lakes in this TMDL?
16	p5 - Sec 3.2 - 2nd paragraph	County land planning departments do not have accurate records or counts of septic tanks. How were municipalities (villages, towns, and other rural entities) engaged in the process to ensure the 21 lakes were accurately accounted for? For example, there is not 352.8 people on septic tanks on Big Green Lake (see Table 2). The entire population in the city is 960 based on 2010 census, there are relatively few houses that are still septic, and nearly all of them vacation properties.
17	p5 - Sec 3.2 - 2nd paragraph	How were vacation homes accounted for in the population estimates of septic loadings? Many lake homes are vacation homes and it would not be appropriate to multiple the number of houses by the county average of persons per household. For example, the vast majority of septic homes on Green Lake are vacation homes.

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Comment	Location Reference (page-section#-paragraph)	Comment
18	p5 - Sec 3.2 - 2nd paragraph	Phosphorus retention coefficients were recommended between 0.8 to 0.98 for properly functioning septic systems. How many of the septic systems are functioning properly? This range was maintained in the WILMS analysis so it appears that 100% of the septic tanks were assumed to be functioning properly. Is this a reasonable assumption? Were test reports reviewed to confirm such a high percentage of properly functioning septic tanks? What is the range of ages of the septic tanks, and is that range acceptable to assume 100% function?
19	p5 - Sec 3.2 - 3rd paragraph	Bedrock is common around many lakes, shallow enough to be near the drain field of the septic tank but deeper than the SSURGO soils layer. For example, the south shore of Big Green Lake has very shallow bedrock and septic tanks. How was bedrock accounted for?
20	p6 - Table 2	Double check the values in the table. Green Lake for example is wrong for surface area, volume and septic population.
21	p9 - Sec 3.4	Explain why <u>samples</u> were from monitoring stations that were not regularly sampled. Why would samples be removed if the dataset was already limited and the lake assumptions are fully mixed and unstratified lakes? Summarize in a table the total data points for each lake, which points were removed, why were the points removed, and what impact that has on the total lake dataset.
22	p9 - Sec 3.4 - bullet list	Are these methods of calculating mean values consistent with methods of calculating permit limits and for POTWs reporting of effluent data? For example, are monthly means averaged to calculate growing season means? Methods of averaging should be consistent between the TMDL and permits.
23	p9 - Sec 3.4 - last paragraph	Need to show lake values and averages, and validation and calibration, in graphs for each lake and period/year, similar to the stream plots in the SWAT report appendix. All the data needs to be presented so it is clear what is used, how robust the dataset is, and where gaps exist.
24	p11 - Sec 3.5 - last paragraph	Document the classification of the 21 lakes in natural and artificial lake categories in a table that shows the 21 lakes and their respective values for residence time, mean depth, areal TP load, and TP concentration - compared against the natural and artificial lake categorical values.
25	p12 - Sec 4 - Table 7	The majority of the adjustment factors are greater than -50% (e.g. 0.49) or +50% (e.g. 1.67) between the observed and predicted growing season mean TP values. Some values are greater than +100% error (e.g. 2.07 and 2.66 adjustment factors). Only 6 of the 21 lakes are within +/- 25% of the observed versus predicted growing season mean TP values. Because growing season mean TP values are calculated by monthly averages, this is a significantly averaged value and it would be expected to have much better correlation between predicted and observed. This calls into significant question the applicability of the WILMS models for some of these lakes and/or the insufficient data collection available for modeling. Significant justification of the adjustment factors is needed, along with a discussion about acceptable ranges of adjustment factors, examples of adjustment factors used in other TMDLs like the Rock River and adjacent Wisconsin River. Additional justification and documentation is needed for path forward of how this significant discrepancy will be corrected so significant "Adjustment Factors" are not needed.
26	p12 - Sec 4 - Table 7	The model calibration is based on "adjustment factors" and not a reasoned basis for calibration. The adjustment factors are wide ranging - from 0.31 to 2.66 - suggesting a randomness to the modeling approach. This indicates that the empirical equations do not accurately predict season mean TP, the loadings to the lakes are inaccurate, or a combination of both. If possible, a lake with measured TP loading should be used to check the SWAT results and to verify the application of the empirical equations.
27	p12 - Sec 4.2 - 1st paragraph	For the lakes that did not have sufficient monitoring data for validation, how were these models validated?
28	p13 - Sec 4.2 - paragraph after two bullets	Provide documentation and examples of other similar TMDL efforts of the acceptable range for the % difference listed in Table 8. Ranges between -28%, +29% and +40% is a large range for a <u>period averaged over all growing seasons</u> considering adjustment factors in Table 7 ranged from -69% to +166%.
29	p13 - Sec 4.2 - Table 8	The most significant % Difference in Table 8 also corresponds to the greatest Adjustment Factors in Table 7. For example Crane Lake had a Table 7 adjustment factor of 1.99 and a Table 8 validation % difference of 29%. Little Green Lake had the largest Table 7 adjustment factor of 2.66 and a Table 8 validation % difference of -28% (the largest underestimate). Pine Lake had the second highest Table 7 adjustment factor of 2.07 and the largest Table 8 validation % difference of 40%. This calls into significant question the applicability of the WILMS models for some of these lakes and/or the insufficient data collection available for modeling.

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Comment	Location Reference (page-section#-paragraph)	Comment
30	p13 - Sec 4.2 - Table 8	Additional versions of Table 8 should be provided for each period/year separately, not simply presented as it is in existing Table 8 where all periods/years are averaged into a single table. Impairments and delisting are not judged by averages. The Lake evaluations and reporting needs to be consistent with WisCALM and permitting requirements so that models and their use in implementation are consistent with listing and permitting criteria.
31	Overall	The WiLMS tool is a high level planning tool that is based on limited water quality data in many areas. It is useful for getting a sense of total phosphorus movement in the Upper Fox-Wolf Basins and to develop some initial water quality management strategies but should not be used as the basis for developing a TMDL. The tool uses inputs from the SWAT model (see comments) and includes adjustment factors – over a wide range – in an attempt to make the tool generally match existing data. It lacks sufficient supporting water quality data and a rigorous empirical basis for use in developing a TMDL with the supporting wasteload allocations, load allocations and safety factor. It may be useful in establishing some initial phosphorus management strategies in conjunction with stakeholders that can be implemented in combination with more intensive and targeted monitoring programs.

- e. Comments of City of Fond du Lac to the Upper Fox River and Wolf River TMDL public comments on draft SWAT and WiLMS models presentations and reports dated November 4, 2016; and



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November 4, 2016

Mr. Keith Marquardt
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Oshkosh Service Center
625 E. County Road Y, Suite 700
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Re: Upper Fox River and Wolf River Total Maximum Daily Load
Public Comments on Draft SWAT and WiLMS Model Presentations and Reports

Dear Keith,

We are submitting these comments on behalf of the City of Fond du Lac, Wisconsin (City). Thank you for granting us an extension to the original October 28, 2016, deadline for these comments.

"Agencies" is used herein as a general term for the United States Environmental Protection Agency (USEPA), United States Geological Survey (USGS), Wisconsin Department of Natural Resources (WDNR), and consultant (Cadmus) model development team.

General Comments on Soil and Water Assessment Tool (SWAT) Model Presentation and Report

1. There are several summary charts and figures in the presentation that are not included in the report but would be helpful to have in the report, including the pie charts and total loadings, and the maps showing ranges of sediment and phosphorus yields.
2. Based on the SWAT model results shown in the presentation, the forest/wetland category is a relatively high contributor of sediment and phosphorus on a percentage basis and averages 0.09 lbs/acre phosphorus yield based on information in the presentation and report. It appears background sources (e.g., groundwater) are also included in this category. The high percentage is a concern since these sources would be difficult to control during total maximum daily load (TMDL) implementation. In fact, the Agencies have referred to these sources as "uncontrollable." Please review this and explain why the loading from these categories is such a high percentage of the total. In addition to checking these numbers, we suggest the individual components of this group be separated (forest separate from wetland and separate from background) in future presentations and in the TMDL report since some of these sources may actually be controllable and would likely be managed differently during TMDL implementation.

Note also that if "controllable" agricultural and urban sources are expected to reduce their phosphorus loadings by 95 percent as suggested at recent meetings, this will result in the requirement to get these sources down to 0.01 lbs/acre or less; well below the 0.09 lbs/acre calculated for the forest/wetland/background category. It may begin to make more sense technically and economically to control wetland and forest sources than to try to reduce agricultural loadings below 0.09 lbs/acre, for example.

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3. Lake Winnebago is reportedly not included in the SWAT modeling; however, is the 722,000 lbs/year total phosphorus load the load at the lake outlet? Or is this the input to the collective upstream pool lakes and Lake Winnebago?
4. Please explain in the report how wastewater treatment plant (WWTP) point sources were added to the model and routed through the subwatersheds. For example, Fond du Lac WWTP's discharge enters reach 115, directly into Lake Winnebago. Was Fond du Lac's WWTP load included in the SWAT modeling and in the pie charts and totals presented (i.e., is it part of the 722,000 lbs/year?).
5. Please explain how municipal separate storm sewer systems (MS4) point sources and urban nonpermitted nonpoint sources were added to the model and routed through the subwatersheds. For instance, were urban best management practices added during calibration similarly to what was done for agriculture, where filter strips were added? Was any attempt made by the Agencies to compare the SWAT urban area modeling results to existing SLAMM, P8, or other MS4 modeling results? Please provide additional documentation of SWAT urban area inputs and outputs in the report so MS4 entities can compare results on their own.
6. Based on the loadings (722,000 lbs/year total phosphorus), load percentages, and areas provided in the presentation, the average agricultural total phosphorus yield is currently 0.29 lbs/acre-year. This appears low in comparison to other sources of information (e.g., USGS SPARROW incremental yield, WDNR's PRESTO model). Please explain why. Were these results vetted with the County Land and Water Conservation Departments, or could they be? Again, note that if agriculture is required to remove 95 percent of its loading, the resulting yield would be 0.01 lbs/acre. This would be well below the forest and wetland phosphorus yield and essentially impossible.
7. The WWTP point sources are shown to be a negligible contributor of sediment/TSS at only 0.4 percent of the total. WWTP effluent total suspended solids (TSS) are biological in nature and should not be considered "sediment." Much of the TSS will decompose and solubilize in receiving streams. Therefore, we recommend against setting stringent (less than current permit limits) sediment wasteload allocations for WWTP point sources in the TMDL. If wasteload allocations must be set, we recommend they be based on current effluent TSS WPDES permit limits and design average flow. We understand that WDNR now recognizes that the stringent TSS wasteload allocations are an issue in the Lower Fox TMDL and we hope a more reasonable approach is taken for this TMDL. In general, we think the Agencies should use allocation methods that are at least partly based on cost-effectiveness.
8. The WWTP point sources are also a very small percentage of the total phosphorus loading. Other modeling by the USGS and our own mass balance calculations show that removal of these WWTP loadings will have essentially no impact on water quality, yet stringent wasteload allocations for WWTPs would represent very high capital and annual expenditures. The WWTPs are already making significant strides in phosphorus minimization and reduction. We suggest the Agencies use this information to support development of reasonable wasteload allocations for the WWTPs and/or a phased approach to incorporating more stringent allocations in the future if and when it is found that more stringent WWTP allocations will provide measurable improvements in water quality.

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9. Overall, the reported errors between modeled and observed loadings appear very high, particularly considering the applicable phosphorus water quality criteria range from 0.04 to 0.1 mg/L. A PBIAS of 70 percent is indicated to be acceptable for phosphorus yet represents an end point at Lake Winnebago ranging from 0.012 to 0.068 mg/L. When there is potential for millions to billions of dollars to be spent in compliance costs, it is reasonable to expect more confidence in the modeling. It appears the model underpredicts sediment and phosphorus loading at several locations and several of our comments in the following are related to potential reasons for these underpredictions.

Specific Comments on SWAT Model Report of July 27, 2016

1. Section 2, Page 2: We suggest adding another map showing major open waters. Cities and/or highways would help to help orient the reader.
2. Section 2, Page 4: Please include MS4 acreages here or in the appendices.
3. Section 2.4, Page 6: The assumption that all WWTP phosphorus is soluble is incorrect and it is surprising that it had no impact on the modeling. Could this be because WWTPs are a negligible contributor of phosphorus overall? In any case, the City of Fond du Lac has data on the components of total phosphorus in its WWTP effluent and will share that data upon request so the Agencies can use a more scientifically sound ratio between soluble inorganic phosphorus and organic phosphorus in WWTP effluent.
4. Section 2.5, Page 10-13: The report discusses soil phosphorus data received from the counties and from the University of Wisconsin (UW) soil analysis lab as if this data was in terms of total phosphorus. It is likely the counties and UW-provided plant available phosphorus data from Bray 1 test results, which is significantly lower than soil total phosphorus. Was this data adjusted upward before it was entered into SWAT, or does SWAT use plant available phosphorus as an input parameter? If it was adjusted, what ratios were used? Recent studies by NEW Water show that this ratio can vary greatly. Also, it appears these soil phosphorus concentrations were used for residential soils, which may not be appropriate in light of the Wisconsin ban on phosphorus in lawn fertilizers. Please provide more detail about this input for the urban and MS4 categories.

Why is the initial soil phosphorus set to the county averages for the years 2005-2009? The most recent five years of data should be available since soil testing is required every four years. As crop prices rise (or sometimes as they fall) so does the amount of fertilizer applied to a field. Therefore, it would be more representative to use the most recent data and is good practice to do so.
5. Section 2.5, Page 10-13: Was a sensitivity analysis done for the assumption that one-half of the soil phosphorus is soluble? Was the 0.5 ratio based on information from the UW-Madison Soils Department or other studies? This ratio can vary significantly depending on manure applications and other factors. This data should be available and used.
6. Section 2.8, Page 15: Sediment and phosphorus storage in wetlands is discussed. How is sediment and phosphorus release from wetlands modeled in SWAT? Some of the sediment and

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phosphorus may be resuspended during wet weather events, and phosphorus can also be released (desorb) from sediments that become anoxic or anaerobic.

7. Section 4.2, Page 19-20: Please further explain why the estimates from Dr. Dale Robertson at two long-term gauging stations are different or less reliable on a monthly basis than those from USGS New Water Information System. These are important gauging stations for TMDL development and implementation; therefore, could the data undergo additional analysis or quality assurance soon so that it can be used in the same way as the other sites? We understand Dr. Robertson agrees that individual months are a problem but believes the annual statistics from these stations are acceptable. How does this affect monthly allocations (if there will be monthly versus annual allocations), growing season means and medians, and other related model outputs and comparisons?
8. Section 4.3, Page 20: It appears crop yields were averaged over the entire modeled period. Is this appropriate, considering cash crop pricing and practices have changed during this time? How sensitive is this parameter? Again, because of significant changes in this area over time we believe the most recent five years of data may be more appropriate.
9. Section 5: In general, it appears a lot of significant adjustments were made during calibration. The Agencies should include an explanation of whether these adjustments are acceptable based on other modeling efforts in our region and standard practices. A few examples follow.
10. Section 5.1, Page 24: Please define "NASS." How sensitive is the use of alfalfa versus Bermuda grass? There is a very large difference in BIO-E for several crops after calibration. The report text indicates the Table 11 observed yields are "in line with" the modeled yields; please include percent difference or other quantitative comparisons. The most recent five years of data may be more appropriate than a long-term average here, too.
11. Section 5.2, Page 25: How were drain tiles handled in the model? There is no mention of GDRAIN, which could help simulate flow and may help with calibration and validation. We are also concerned that the phosphorus in drain tile discharge does not appear to be included in the model. Tiling is common practice in these basins. This would be primarily soluble phosphorus and therefore relatively mobile and available to algae.
12. Section 5.2, Page 25-26: The calibration also resulted in large adjustments in some Table 12 parameters that are not fully explained in terms of sensitivity and whether they are appropriate for our region. One example is "GW_DELAY" that was changed during calibration from a default value of about a month to values of almost a year. Does it really take almost a year to recharge the shallow aquifer in our region? And if so, why? Is it related to frozen ground or other factors?
13. Section 5.3, Page 28-29: FILTERW (filter strip width from edge of field) was changed from zero to 10 meters (33 feet) during calibration. This seems highly inappropriate for agricultural land considering NR 151 only requires a 5-foot tillage setback, we know of no buffer ordinances in these basins, cash crop prices have been high during the modeled period resulting in tillage of buffers in some instances, and local county land and water conservation departments (i.e., Fond du Lac County) have stated that buffer strips are lacking and would be a good management

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practice to employ as part of a trading or adaptive management program. If filter strips are inappropriately included in the initial model, it will be more difficult to model a future scenario that employs this best management practice. On the other hand, stream slope was adjusted upward and stream width adjusted downward during calibration to reduce the modeled sedimentation in local streams. We question the appropriateness of this adjustment in light of recent Dane County studies showing significant deposition of phosphorus-laden sediments in low gradient streams there. Please provide additional justification for these calibration steps, which appear arbitrary and inappropriate.

14. Section 5.3, Page 30: The R² value for the Fox River at Berlin is extremely low. Please see comment no. 7 and include additional commentary about this in the report.
15. Section 5.3, P. 29 - 31: See previous comments about settling in wetlands. This parameter was adjusted to a high level during calibration. The *Soil & Water Assessment Tool Input/Output Documentation Version 2012*, Arnold, et. al., suggests much lower values for pond settling in Table 28-1 when internal phosphorus flux is high. We believe high flux would be expected in the shallow wetlands and ponds that are found in these basins. Again, we question whether subsequent resuspension and desorption of phosphorus is handled appropriately in the model. The channel organic phosphorus concentration of 100 ppm may also be low based on Dane County studies.
16. Sections 5.3 and 5.4, Page 30 and 32: Change references to "Appendix D" to "Appendix E" and "Appendix F," respectively.
17. Section 5.4, Page 32: Is the table footnote correct? The text references an issue with April 2013.
18. Section 6, Page 34: We suggest the Agencies reevaluate filter strips, channel slopes, and other parameters to acceptable values as noted previously before suggesting that the only way to adjust the model is with more sediment monitoring data.
19. Section 6, Page 34: We agree that the annual loadings, not monthly loadings, from the model are important. It appears the Agencies believe the annual monitoring data at two key stations is more appropriate than monthly data, as well. We believe annual load and wasteload allocations will be appropriate for this TMDL since the goal is to meet water quality targets in lakes such as Winnebago that have detention times greater than a year. Please verify that this is now the intent, since early presentations by the Agencies indicated that load and wasteload allocations might be expressed on a monthly basis.
20. Section 6, Page 34: Daily weather station data is available at some of the major WWTPs in the basin. Please let us know if you would like data from the Fond du Lac WWTP weather station.
21. Appendix A, Page 36 and Appendix B: Please check manure application rates used in the modeling. The amount reported by counties on Page 36 appears much higher than the applications assumed in the modeling that are shown in Appendix B.

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General Comments on WiLMS Model Presentation and Report

1. The Agencies should document each lake in the basins by type and by its associated phosphorus criterion early in the presentation and report. We still have many questions about the appropriateness and attainability of lake and reservoir criteria. It is difficult to assess this and comment on the appropriateness of the models without knowing how the current lake concentrations compare to their respective criteria. This information will also help reviewers assess the potential importance or implications of relatively poor calibration adjustments and validation percent differences. It would also give reviewers the opportunity to review and comment early on a particular lake or reservoir's assigned criterion, before subsequent modeling and allocations make it more difficult to change the criteria.
2. While it does not seem appropriate to use a complete mix model on Green Lake or any other stratified lakes, we acknowledge that the calibration adjustment factor was small and validation percent difference was low for Green Lake. This may be the result of a large phosphorus data set or coincidence, more than having an appropriate model in this case. A more robust model may still be recommended for implementation. The Canfield-Bachman model may also be inappropriate for Buffalo Lake, which is a long, narrow, shallow impoundment. Additional consideration and justification of the selected models is needed, especially for special cases such as these.
3. The use of a June through September average phosphorus concentration may introduce some error since the phosphorus water quality criteria are assessed based on May through October medians. Statistically, does the use of the average and a shorter period make the models more conservative? If so, by how much, and is it more than would be expected or required for a TMDL margin of safety? How will this be rectified in the TMDL? Are there other implications of using a June through September lake phosphorus concentration, for example in combination with SWAT loadings which are based on year-round and even long-term averages in some cases?
4. The calibration method assumes the lake phosphorus data are correct. However, in many cases the data are not sufficient for a good calibration or for any validation. Where sufficient data are not available, we are disappointed that the Agencies did not put out a call for additional data collection. The City of Fond du Lac has offered to assist with data collection on multiple occasions, and we are sure others would have been willing, too. We strongly recommend a data gap analysis and data collection step (as necessary) be included future Wisconsin TMDLs, as it is in Illinois. We also suggest further cleaning the data to remove nonrepresentative sites and data, as noted in our report comments that follow.
5. The calibration method assumes the total loading to the lake and other model inputs are correct. In fact, there are problems with the SWAT model (see previous comments). Also the septic systems are assumed to be working properly; these systems could be failing or soil adsorption sites saturated such that much more phosphorus leaches to the lake in some cases. Furthermore, the lake models may not adequately address legacy phosphorus and internal recycle. Particularly where calibration adjustment factors were high and/or validation differences were 15 percent or greater, we recommend taking a closer look at the loadings (including contacting the county about farming practices and failing septic systems in the associated watershed) and adjusting those as needed, then replotting points on the curve, before determining and applying any

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calibration adjustment factor. As previously noted, in some cases a different lake model may be more appropriate.

Specific Comments on WiLMS Report of July 27, 2016

1. Section 3.2 and 3.2, Pages 3-4: For Shawano Lake was the lake area itself deducted from the watershed area before calculating the ratio? We think it should be.
2. Section 3.4, Page 9: During the data cleaning step, was an effort also made to use the most representative data, for example from sample stations from the deepest part of a lake versus shallow bays or shorelines? Reference the *Wisconsin 2016 WisCALM* report for appropriate data considerations.
3. Section 4.1, Page 12: Explain the calibration method in more detail. Were the concentrations and loadings averaged for the calibration period and then plotted/used as a single point on which to calculate the adjustment factor? Or was each year's mean concentration and annual load plotted individually, a best-fit curve determined, and the correction factor calculated from the difference between the two curves? The Agencies should provide graphs for each lake in the appendices.
4. Section 4.1, Page 12: Little Green Lake has a loading range of 0.09 to 0.71 lbs/acre-year for the modeled period, averaging 0.245 lbs/acre. The calibration required a very high adjustment factor (2.66) and the validation percent difference was also relatively high at 28 percent. No real explanation is provided for the high adjustment factor or percent difference. Could the high adjustment factor be caused by higher internal lake loadings, for example, and would that make sense based on what the WDNR knows about these lakes? As noted above, in cases like this where the calibration adjustment factor and/or percent difference is high, we recommend a more detailed review of the watershed loadings (including septic systems) and internal loadings before determining and applying an adjustment factor. The SWAT model for those portions of the basins could then be updated accordingly. Again, it may be necessary to select a different lake model in some cases.
5. Page 13: The report notes the potential shortcomings of these models as calibrated (errors in estimated flows and loadings to the lakes and/or insufficient phosphorus data), yet jumps to the conclusion that the calibrated WiLMS models are acceptable for use in the TMDL. We strongly recommend additional review of phosphorus data, SWAT modeling, and lake loadings, at a minimum, before using the models for lakes with high calibration adjustment factors or high validation percent differences.

Closing Comments

It is difficult to comment on these modeling reports without knowing the implications of the comments on the eventual load and wasteload allocations. We request the opportunity to submit additional comments on the modeling in the future, after the Jensen model report and draft allocations are released.

We continue to have significant concerns about the appropriateness and attainability of lake and reservoir water quality criteria for phosphorus. This was not addressed by these draft reports but needs to be addressed very soon because of the potential extraordinary cost and other (i.e., carbon footprint,

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antibacksliding, etc.) implications. We suggest using higher initial TMDL phosphorus targets for the lakes and reservoirs initially; i.e., 0.1 mg/L for pool lakes and impoundments as was used for Lake Koshkonong in the Rock River TMDL, or 60 to 90 µg/L as is used for similar lakes in Minnesota. At a recent meeting a site-specific criterion on the order of 44 µg/L was mentioned for Lake Winnebago. This value is associated with a chlorophyll a concentration that has been used as a 303(d) listing threshold in Wisconsin but is not a promulgated water quality standard and has not been vetted as such. Additional consideration needs to be given to an appropriate target. If that cannot be done within the schedule for TMDL, the Agencies should consider phased implementation of the TMDLs where point source wasteload allocations are initially more lenient (in consideration of cost and the fact that they are already removing significant phosphorus compared to nonpoint sources) until a scientifically sound and vetted site specific criterion can be developed and nonpoint sources make more progress with load reductions. This type of adaptive implementation approach has been used in other locations and will also allow for more data collection, refinement of models, and informed management decisions. This is particularly important since there is significant uncertainty about the appropriate water quality criteria, legacy phosphorus internal recycle loadings and flushing rates, and overall attainability. We are encouraged that the USEPA recently acknowledged the potential for phased TMDL implementation and would be happy to work with the Agencies on appropriate report and WPDES permit language.

Please contact us with any questions.

Sincerely,

STRAND ASSOCIATES, INC.[®]



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