



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5
77 WEST JACKSON BOULEVARD
CHICAGO, IL 60604-3590

REPLY TO THE ATTENTION OF:
W-16J

July 28, 2021

Glenn Skuta, Watershed Division Director
Minnesota Pollution Control Agency
520 Lafayette Road North
St. Paul, Minnesota 55155-4194


Dear Mr. Skuta:

The U.S. Environmental Protection Agency completed its review of the final Total Maximum Daily Loads (TMDL) for Lake Winona, including supporting documentation. Lake Winona is located in central Minnesota in Douglas County. The Lake Winona TMDL was calculated for phosphorus to address the impaired aquatic recreation use.

The Lake Winona TMDL meets the requirements of Section 303(d) of the Clean Water Act and EPA's implementing regulations set forth at 40 C.F.R. Part 130. Therefore, EPA approves Minnesota's one (1) phosphorus TMDL. EPA describes Minnesota's compliance with the statutory and regulatory requirements in the enclosed decision document.

EPA acknowledges Minnesota's efforts in submitting this TMDL and look forward to future submissions by the State of Minnesota. If you have any questions, please contact Mr. David Werbach of the Watersheds and Wetlands Branch at Werbach.david@epa.gov or 312-886-4242.

Sincerely,

 Digitally signed by Fong,
Tera
Date: 2021.07.28
10:03:59 -05'00'

Tera L. Fong
Division Director, Water Division

Cc: Bonnie Finnerty, MPCA

wq-iw8-32g

DECISION DOCUMENT FOR THE LAKE WINONA TMDL, MINNESOTA

Section 303(d) of the Clean Water Act (CWA) and EPA's implementing regulations at 40 C.F.R. Part 130 describe the statutory and regulatory requirements for approvable TMDLs. Additional information is generally necessary for EPA to determine if a submitted TMDL fulfills the legal requirements for approval under Section 303(d) and EPA regulations, and should be included in the submittal package. Use of the verb "must" below denotes information that is required to be submitted because it relates to elements of the TMDL required by the CWA and by regulation. Use of the term "should" below denotes information that is generally necessary for EPA to determine if a submitted TMDL is approvable. These TMDL review guidelines are not themselves regulations. They are an attempt to summarize and provide guidance regarding currently effective statutory and regulatory requirements relating to TMDLs. Any differences between these guidelines and EPA's TMDL regulations should be resolved in favor of the regulations themselves.

1. Identification of Water body, Pollutant of Concern, Pollutant Sources, and Priority Ranking

The TMDL submittal should identify the water body as it appears on the State's/Tribe's 303(d) list. The water body should be identified/georeferenced using the National Hydrography Dataset (NHD), and the TMDL should clearly identify the pollutant for which the TMDL is being established. In addition, the TMDL should identify the priority ranking of the water body and specify the link between the pollutant of concern and the water quality standard (see Section 2 below).

The TMDL submittal should include an identification of the point and nonpoint sources of the pollutant of concern, including location of the source(s) and the quantity of the loading, e.g., lbs/per day. The TMDL should provide the identification numbers of the NPDES permits within the water body. Where it is possible to separate natural background from nonpoint sources, the TMDL should include a description of the natural background. This information is necessary for EPA's review of the load and wasteload allocations, which are required by regulation.

The TMDL submittal should also contain a description of any important assumptions made in developing the TMDL, such as:

- (1) the spatial extent of the watershed in which the impaired water body is located;
- (2) the assumed distribution of land use in the watershed (e.g., urban, forested, agriculture);
- (3) population characteristics, wildlife resources, and other relevant information affecting the characterization of the pollutant of concern and its allocation to sources;

(4) present and future growth trends, if taken into consideration in preparing the TMDL (e.g., the TMDL could include the design capacity of a wastewater treatment facility); and

(5) an explanation and analytical basis for expressing the TMDL through *surrogate measures*, if applicable. *Surrogate measures* are parameters such as percent fines and turbidity for sediment impairments; chlorophyll *a* and phosphorus loadings for excess algae; length of riparian buffer; or number of acres of best management practices.

Comment:

Location Description/Spatial Extent:

Lake Winona is located in central Minnesota, within the Long Prairie River watershed (Section 1.2 of the final TMDL document). The original hydrology of the lake has been substantially altered by urbanization and flow into the lake is mainly from stormwater runoff and wastewater treatment facility (WWTF) discharge (Section 3.5.2.1 of the final TMDL document). Discharge from the lake is through culverts into Lake Agnes, then Lake Henry, and then into the larger Lake Le Homme Dieu. From there, several lakes form the headwaters of Long Prairie River, which flows north into the Crow Wing River and ultimately the Mississippi River (Figure 1 of the final TMDL document).

The lake has a surface area of 183 acres, a mean depth of 4.4 feet, and a maximum depth of 9 feet. The watershed for the lake is approximately 1,600 acres, including the lake (Table 3 and Figure 3 of the final TMDL document). Table 1 of this Decision Document contains the listing information for Lake Winona.

Table 1: Listing information for Lake Winona

Name	ID	Pollutant/Stressor	Impaired Use	Year First Listed	Target Completion	TMDL Pollutant
Lake Winona	21-0081-00	Nutrients/Eutrophication	Aquatic Recreation	2002	2025	Phosphorus

Land Use:

MPCA describes the Lake Winona land use in Section 3.3 of the final TMDL document. The land use is predominately commercial/residential land (approximately 85%) (Table 5 of the final TMDL document; Table 2 of this Decision Document). Most of the watershed for Lake Winona is in the city of Alexandria, Minnesota, which has a population of approximately 12,000.

Table 2: Land use summary for the Lake Winona TMDL

Name	ID	Drainage Area (Acres)*	Commercial (acres)	Highway (%)	Industrial (%)	Institutional (%)	Residential (%)
Lake Winona	21-0081-00	1271	570	22	9	139	530
Approximate Percent of total Lake Winona watershed area			44.9%	1.7%	0.7%	11%	41.7%

* - numbers are rounded; and do not include lake acreage

Problem Identification:

Lake Winona was identified as having an impaired Aquatic Recreation Use due to high concentrations of phosphorus and chlorophyll-*a* (chl-*a*) and low Secchi disk transparency depths. The lake is classified as a shallow lake under the MPCA lake classification system (Section 2 of the final TMDL document).

The Alexandria Lakes Area Sanitary District (ALASD) began routine water quality monitoring of Lake Winona in 1980, along with monitoring data collected by MPCA (Section 3.4.1 of the final TMDL document). MPCA assessed the data from 2005-2014 to develop the TMDL. MPCA initially began developing the TMDL in the late 2000's, but deferred completing the TMDL until additional data could be gathered. Monitoring sites in the north and south portions of the lake were reviewed, and the data indicated that the lake exceeded the lake eutrophication criteria, both the North Central Hardwood Forests ecoregion criteria (Table 2 of the final TMDL document) and the Lake Winona site specific criteria (Table 2 of the final TMDL document). Table 6 and Figures 4-9 of the final TMDL document present the average growing season water quality data from 2005-2014, and Appendix C of the final TMDL document contains more recent (through 2018) water quality data for the lake. The data indicates that water quality has improved in the last few years, but still significantly exceeds the Lake Winona site specific criteria (Table 2 of the final TMDL document).

MPCA also noted that the lake has suffered a significant loss of macrophytes (i.e., submerged aquatic plants) in the lake since 1977 (Section 3.4.2 of the final TMDL document). The fish community has also changed over time, becoming more dominated by rough fish such as carp (Section 3.4.3 of the final TMDL document). MPCA noted that a carp barrier failed sometime after 2004 on Lake Le Homme Dieu, allowing carp to migrate into Lake Winona. However, the State did note that the carp biomass dropped in 2015, and bluegill and black crappie populations had increased.

Lake Winona was included on the final 2020 Minnesota 303(d) list due to excessive nutrients as indicated by total phosphorus levels. While phosphorus is an essential nutrient for aquatic life, elevated concentrations of phosphorus can lead to nuisance algal blooms that negatively impact aquatic life and recreation (e.g., swimming, boating, fishing, etc.). Algal decomposition can deplete dissolved oxygen levels within the water column and can stress benthic macroinvertebrates and fish. Depletion of oxygen in the water column can also lead to conditions where phosphorus is released from bottom sediments (i.e., internal loading). Also, excess algae can shade the water column which limits the distribution of aquatic vegetation. Aquatic vegetation stabilizes bottom sediments, and also is an important habitat for macroinvertebrates and fish.

Priority Ranking: MPCA's schedule for TMDL completions, as indicated on the 303(d) impaired waters list, reflects Minnesota's priority ranking of this TMDL. MPCA has aligned TMDL priorities with the watershed approach and Watershed Restoration and Protection Strategy (WRAPS) cycle. The schedule for TMDL completion corresponds to the WRAPS report completion on the 10-year cycle. Mainstem river TMDLs, which are not contained in major watersheds and thus not addressed in WRAPS, must also be completed. The MPCA

developed a state plan, Minnesota's TMDL Priority Framework Report, to meet the needs of EPA's national measure (WQ-27) under EPA's Long-Term Vision for Assessment, Restoration and Protection under the CWA section 303(d) program. As part of these efforts, the MPCA identified water quality-impaired segments that will be addressed by TMDLs by 2022. The waters of the Lake Winona addressed by this TMDL are part of the MPCA prioritization plan to meet EPA's national measure.

Pollutant of Concern:

The pollutant of concern is phosphorus.

Source Identification (point and nonpoint sources):

Point Source Identification: The potential point sources to the Lake Winona are:

NPDES permitted wastewater facilities: MPCA determined that there is one NPDES permitted wastewater facility discharging phosphorus within the Lake Winona watershed (Section 3.5.1 of the final TMDL document), the ALASD WWTF (MN0040738). MPCA assigned a portion of the phosphorus allocation to this facility.

Municipal Separate Storm Sewer System (MS4) dischargers: The City of Alexandria's MS4 (MS400264) discharges to Lake Winona (Section 3.5.1 of the final TMDL document). Stormwater can contain phosphorus from pet waste, wildlife waste, organic debris, and fertilizer runoff from urban lands. Figure 3 of the final TMDL document maps the approximate locations of storm sewers in the Lake Winona watershed.

Concentrated Animal Feeding Operations (CAFOs): MPCA did not identify any CAFOs in the Lake Winona watershed.

Permitted Construction and Industrial Stormwater: MPCA determined that a portion of the Lake Winona watershed includes lands addressed under a construction stormwater permit (Section 4.3.1 of the final TMDL document). MPCA reviewed local records and determined that the approximate annual percentage of land area under construction has been 2.04% in Douglas County (Table 13 of the final TMDL document). MPCA also noted that there is a small percentage of industrial stormwater dischargers in the watersheds. MPCA set aside an allocation for industrial stormwater dischargers that is equal to the allocation for construction stormwater in the watershed. Section 5 of this Decision Document further discusses the wasteload allocation (WLA) for stormwater in the TMDLs. Construction and industrial sites may contribute pollutants via runoff during stormwater events. These areas within the Lake Winona must comply with the requirements of the MPCA's NPDES Stormwater Program and create a Stormwater Pollution Prevention Plan (SWPPP) that summarizes how stormwater will be minimized from the site.

Nonpoint Source Identification: The potential nonpoint sources to the Lake Winona are:

Overland Runoff: Runoff from urban areas (i.e., urban, residential, commercial or industrial land uses) can contribute phosphorus to local waterbodies. Stormwater from urban areas, which drain impervious surfaces, may introduce phosphorus derived from wildlife or pet droppings, leaves, and other organic matter to surface waters (Section 3.5.2.1 of the final TMDL document).

Internal loading: The release of phosphorus from lake sediments, via physical disturbance from benthic fish (rough fish, e.g., carp), wind mixing the water column, and decaying curly-leaf pondweeds, may all contribute internal phosphorus loading to Lake Winona. Phosphorus may build up in the bottom waters of the lake and may be resuspended or mixed into the water column when the thermocline decreases and the lake water mixes.

As discussed further in Section 3 of this Decision Document, MPCA reviewed a study of lake cores in Lake Winona (Wang, *et al.*, 2009) to investigate the role of internal loading in the lake (Section 3.5.2.3 of the final TMDL document). Results showed that internal loading was a significant issue in the narrow central portion of the lake (Figure 2 of the final TMDL document).

Atmospheric deposition: Phosphorus and organic material may be added via particulate deposition. Particles from the atmosphere may fall onto lake surfaces or other surfaces within the Lake Winona watershed. Phosphorus can be bound to these particles which may add to the phosphorus inputs to surface water environments.

Future Growth:

MPCA did not calculate a reserve capacity of the TMDLs. Any expansion of point or nonpoint sources will need to comply with the respective WLA and load allocation (LA) values calculated in the Lake Winona TMDL.

The EPA finds that the TMDL document submitted by MPCA satisfies the requirements of the first criterion.

2. Description of the Applicable Water Quality Standards and Numeric Water Quality Target

The TMDL submittal must include a description of the applicable State/Tribal water quality standard, including the designated use(s) of the water body, the applicable numeric or narrative water quality criterion, and the antidegradation policy (40 C.F.R. §130.7(c)(1)). EPA needs this information to review the loading capacity determination, and load and wasteload allocations, which are required by regulation.

The TMDL submittal must identify a numeric water quality target(s) – a quantitative value used to measure whether or not the applicable water quality standard is attained. Generally, the pollutant of concern and the numeric water quality target are, respectively, the chemical causing the impairment and the numeric criteria for that chemical (e.g., chromium) contained in the water quality standard. The TMDL expresses the relationship between any necessary reduction of the pollutant of concern and the attainment of the numeric water quality target. Occasionally, the pollutant of concern is different from the pollutant that is the subject of the numeric water quality target (e.g., when the pollutant of concern is phosphorus and the numeric water quality target is expressed as Dissolved Oxygen (DO) criteria). In such cases, the TMDL submittal should explain the linkage between the pollutant of concern and the chosen numeric water quality target.

Comment:

Designated Uses:

Water quality standards (WQS) are the fundamental benchmarks by which the quality of surface waters are measured. Within the State of Minnesota, WQS are developed pursuant to the Minnesota Statutes Chapter 115, Sections 03 and 44. Authority to adopt rules, regulations, and standards as are necessary and feasible to protect the environment and health of the citizens of the State is vested with the MPCA. Through adoption of WQS into Minnesota's administrative rules (principally Chapters 7050 and 7052), MPCA has identified designated uses to be protected in each of its drainage basins and the criteria necessary to protect these uses.

Minnesota Rule Chapter 7050 designates uses for waters of the state. Lake Winona is designated as Class 2B, 3B, 4A, 4B, 5, and 6 water, with Class 2B being the most restrictive for the pollutant being addressed by the TMDL (Section 2 of the final TMDL document). The Class 2 designated use is described in Minnesota Rule 7050.0140 (3):

“Aquatic life and recreation includes all waters of the state that support or may support fish, other aquatic life, bathing, boating, or other recreational purposes and for which quality control is or may be necessary to protect aquatic or terrestrial life or their habitats or the public health, safety, or welfare.”

Standards:

Narrative Criteria:

Minnesota Rule 7050.0150 (3) set forth narrative criteria for Class 2 waters of the State:

“For all Class 2 waters, the aquatic habitat, which includes the waters of the state and stream bed, shall not be degraded in any material manner, there shall be no material increase in undesirable slime growths or aquatic plants, including algae, nor shall there be any significant increase in harmful pesticide or other residues in the waters, sediments, and aquatic flora and fauna; the normal fishery and lower aquatic biota upon which it is dependent and the use thereof shall not be seriously impaired or endangered, the species composition shall not be altered materially, and the propagation or migration of the fish and other biota normally present shall not be prevented or hindered by the discharge of any sewage, industrial waste, or other wastes to the waters.”

Numeric criteria:

In Section 2 of the final TMDL document, MPCA describes the applicable numeric water quality standards (Table 2 of the final TMDL document and Table 3 of this Decision Document).

MPCA selected phosphorus as the appropriate target parameter to address eutrophication problems because of the interrelationships between phosphorus and chl-*a*, and phosphorus and Secchi Depth (SD). Algal abundance is measured by chl-*a*, which is a pigment found in algal cells. As more phosphorus becomes available, algae growth can increase. Increased algae in the water column will decrease water clarity that is measured by SD depth. These criteria apply from June 1-September 30.

In developing the lake nutrient standards for Minnesota lakes, MPCA evaluated data from a large cross-section of lakes within each of the State’s ecoregions. Clear relationships were established between the causal factor, phosphorus, and the response variables, chl-*a* and SD depth. MPCA anticipates that by meeting the phosphorus concentration the response variables chl-*a* and SD will be attained and the Lake Winona TMDL will achieve the designated beneficial uses. For a lake to achieve its’ designated beneficial use, the lake must not exhibit signs of eutrophication and must allow water-related recreation, fishing and aesthetic enjoyment. MPCA views the control of eutrophication as the lake enduring minimal nuisance algal blooms and exhibiting desirable water clarity.

During the development of the Lake Winona TMDL, MPCA determined that the water quality criteria for the lake needed to be revised. As discussed in the “*Lake Winona site-specific nutrient criteria development*” (MPCA 2011) report, site-specific criteria (SSC) were developed for Lake Winona. These revised criteria were approved by the EPA on June 12, 2014, and contained in Table 3 of this Decision Document. The site-specific criteria are measured as summer averages at the South Winona sampling site (Figure 2 of the final TMDL document), with summer defined as June 1 to September 30 (Section 2 of the final TMDL document).

Table 3: Lake Criteria for the Lake Winona TMDL

Name	Lake Type	Total Phosphorus (µg/L)	Chlorophyll-a (µg/L)	Secchi Transparency (meters)
Lake Winona	Shallow	≤ 75	≤ 20	≥ 1.0

Target: MPCA employed the phosphorus criteria of **75 µg/L** measured as a summer average as noted in Table 3 of this Decision Document and Table 2 of the final TMDL document. As discussed further in Section 3 of this Decision Document, the phosphorus loads were reduced to determine the attainment of the chl-*a* criteria or the other eutrophication criteria as required.

The EPA finds that the TMDL document submitted by MPCA satisfies the requirements of the second criterion.

3. Loading Capacity - Linking Water Quality and Pollutant Sources

A TMDL must identify the loading capacity of a water body for the applicable pollutant. EPA regulations define loading capacity as the greatest amount of a pollutant that a water can receive without violating water quality standards (40 C.F.R. §130.2(f)).

The pollutant loadings may be expressed as either mass-per-time, toxicity or other appropriate measure (40 C.F.R. §130.2(i)). If the TMDL is expressed in terms other than a daily load, e.g., an annual load, the submittal should explain why it is appropriate to express the TMDL in the unit of measurement chosen. The TMDL submittal should describe the method used to establish the cause-and-effect relationship between the numeric target and the identified pollutant sources. In many instances, this method will be a water quality model.

The TMDL submittal should contain documentation supporting the TMDL analysis, including the basis for any assumptions; a discussion of strengths and weaknesses in the analytical process; and results from any water quality modeling. EPA needs this information to review the loading capacity determination, and load and wasteload allocations, which are required by regulation.

TMDLs must take into account *critical conditions* for stream flow, loading, and water quality parameters as part of the analysis of loading capacity (40 C.F.R. §130.7(c)(1)). TMDLs should define applicable *critical conditions* and describe their approach to estimating both point and nonpoint source loadings under such *critical conditions*. In particular, the TMDL should discuss the approach used to compute and allocate nonpoint source loadings, e.g., meteorological conditions and land use distribution.

Comment:

The phosphorus TMDL developed for Lake Winona was calculated using the U.S. Army Corps of Engineers (USACE) BATHHTUB Model (Section 4.1 and Appendix B of the final TMDL document; Table 4 of this Decision Document). The BATHHTUB model was used to calculate loading capacities for the lake and to link observed phosphorus water quality conditions and estimate phosphorus loads to determine in-lake water quality. MPCA has previously employed BATHHTUB successfully in many lake studies in Minnesota. BATHHTUB is a steady-state annual or seasonal model that predicts a lake's growing season (June 1 to September 30) average surface water quality. BATHHTUB utilizes annual or seasonal time-scales which are appropriate because watershed phosphorus loads are normally impacted by seasonal conditions.

Watershed loading inputs for the model were developed utilizing the WINSLAMM model (Sections 3.5.2, 4.3.3. and Appendix A of the final TMDL document). WINSLAMM is an urban water quality model designed to address stormwater hydrology. Runoff volumes, pollutant loadings, and the impacts of various stormwater Best Management Practices (BMPs) such as culverts, ponds, and other stormwater retention efforts, along with storm precipitation data are utilized to determine stormwater pollutant loadings. MPCA split the Lake Winona watershed into five subwatersheds based upon stormwater BMP location (Figure 3 of the final TMDL document). MPCA also performed a validation process to determine the effectiveness of the WINSLAMM model. As noted in Table 8 of the final TMDL document, the model fairly represents the actual stormwater system and water quality data.

MPCA utilized the results from the WINSLAMM model to provide inputs into the BATHHTUB model (Section 4.1.1.1 of the final TMDL document). In addition to the WINSLAMM outputs, MPCA included data from the ALASD discharge. MPCA utilized the model calibration process to determine the impact of internal phosphorus loading on water quality (Section 4.1.1.5 of the final TMDL document). The core study for Lake Winona (Wang, *et al.*, 2009) noted that internal loading was present in portions of the lake. Based upon the results, MPCA added an additional factor to account for internal loading of phosphorus in Lake Winona, beyond the implicit internal loading factor incorporated in BATHHTUB (Section 4.1.1.5 of the final TMDL document).

Loading capacities (kilograms per day (kg/day)) were calculated during the growing season (June 1 through September 30) using BATHTUB and then allocated to the WLA, LA, and the margin of safety (MOS). The results are summarized in Table 4 of this Decision Document. To simulate the load reductions needed to achieve the WQS, a series of model simulations were performed. Each simulation reduced the total current amount of phosphorus entering each of the water bodies from June 1 through September 30 and computed the anticipated water quality response within the lake.

The June to September growing season was chosen by MPCA because it corresponds to the eutrophication criteria, contains the months that the general public typically uses Lake Winona for aquatic recreation, and is the time of the year when water quality is likely to be impaired by excessive nutrient loading.

Table 4: TMDL Summary for Lake Winona (21-0081-00)

Load Component		Existing TP load	TMDL TP load		Estimated load reduction	
		(kg/yr)	(kg/yr)	(kg/day)	(kg/yr)	(%)
Wasteload Allocations	Construction stormwater (MNR100001)	1.7	1.7	0.005	0.0	0%
	Industrial stormwater (MNR50000)	1.7	1.7	0.005	0.0	0%
	City of Alexandria stormwater (MS400264)	331.9	76.7	0.207	255.2	77%
	ALASD (MN0040738)	819.6	665.0	1.821	154.6	19%
	Total WLA	1,154.9	745.1	2.038	409.8	35%
Load Allocations*	LaGrand Township watershed runoff	46.3	8.1	0.022	38.2	83%
	Internal Load	715.3	13.5	0.033	701.8	98%
	Atmospheric	22.2	22.2	0.058	0.0	0%
	Total LA	783.8	43.8	0.113	740.0	94%
MOS**			9.8	0.026		
TOTAL		1,938.7	798.7	2.177	1149.8	59%

*LA components are broken down for guidance in implementation planning; loading goals for these components may change through the adaptive implementation process, but the total LA for the lake will not be modified from the total listed in Table 4 of this Decision Document (i.e., Table 16 of the final TMDL document).

** The 10% MOS is based on an additional 10% reduction from watershed runoff components only (construction stormwater, industrial stormwater, City of Alexandria MS4, and LaGrand Township) given the already large reductions needed from internal load.

Conclusion: EPA supports the data analysis and modeling approach utilized by MPCA in its calculation of wasteload allocations, load allocations and the margin of safety for the Lake Winona phosphorus TMDL. EPA finds MPCA’s approach for calculating the loading capacity for the TMDL to be reasonable and consistent with EPA guidance.

The EPA finds that the TMDL document submitted by MPCA satisfies the requirements of the third criterion.

4. Load Allocations (LA)

EPA regulations require that a TMDL include LAs, which identify the portion of the loading capacity attributed to existing and future nonpoint sources and to natural background. Load allocations may range from reasonably accurate estimates to gross allotments (40 C.F.R. §130.2(g)). Where possible, load allocations should be described separately for natural background and nonpoint sources.

Comment:

MPCA determined the LA calculations for Lake Winona TMDL based on the applicable WQS. MPCA identified several nonpoint sources which contribute nutrient loading to Lake Winona (Section 4.2 of the final TMDL document and Table 4 of this Decision Document). These nonpoint sources included: watershed runoff from the non-MS4 sections, internal loading and atmospheric deposition. For the TMDL, MPCA calculated individual LA values for watershed runoff, internal loading, and atmospheric deposition.

EPA finds MPCA's approach for calculating the LA to be reasonable. The EPA finds that the TMDL document submitted by MPCA satisfies the requirements of the fourth criterion.

5. Wasteload Allocations (WLAs)

EPA regulations require that a TMDL include WLAs, which identify the portion of the loading capacity allocated to individual existing and future point source(s) (40 C.F.R. §130.2(h), 40 C.F.R. §130.2(i)). In some cases, WLAs may cover more than one discharger, e.g., if the source is contained within a general permit.

The individual WLAs may take the form of uniform percentage reductions or individual mass based limitations for dischargers where it can be shown that this solution meets WQSs and does not result in localized impairments. These individual WLAs may be adjusted during the NPDES permitting process. If the WLAs are adjusted, the individual effluent limits for each permit issued to a discharger on the impaired water must be consistent with the assumptions and requirements of the adjusted WLAs in the TMDL. If the WLAs are not adjusted, effluent limits contained in the permit must be consistent with the individual WLAs specified in the TMDL. If a draft permit provides for a higher load for a discharger than the corresponding individual WLA in the TMDL, the State/Tribe must demonstrate that the total WLA in the TMDL will be achieved through reductions in the remaining individual WLAs and that localized impairments will not result. All permittees should be notified of any deviations from the initial individual WLAs contained in the TMDL. EPA does not require the establishment of a new TMDL to reflect these revised allocations as long as the total WLA, as expressed in the TMDL, remains the same or decreases, and there is no reallocation between the total WLA and the total LA.

Comment:

WWTF: MPCA stated that there is one NPDES permitted wastewater facility contributing to Lake Winona (Section 4.3.4 of the final TMDL document). Tables 4 and 5 of this Decision Document contain the WLAs for phosphorus to Lake Winona. The EPA notes that this TMDL approval only addresses the daily WLA; implementation of the WLA and the resulting effluent limit are addressed in the NPDES permit for the ALASD (Appendix D of the final TMDL document).

MS4 Stormwater: MPCA calculated a WLA for the City of Alexandria MS4 discharges into Lake Winona (Sections 3.5.2 and 4.3.2 of the final TMDL document). The WLA is based upon the jurisdictional area of the City of Alexandria MS4 in the TMDL watershed, multiplied by the phosphorus loading as determined through the use of the WINSLAMM model discussed in Section 3 of this Decision Document.

Construction and Industrial Stormwater: MPCA also calculated a portion of the WLA and assigned it to both construction stormwater and industrial stormwater. Overall, the construction and industrial stormwater WLA make up a very small portion of the overall loading capacity but MPCA wanted to recognize their contributions. Both of these WLAs were represented as a categorical WLA and WLAs were not subdivided out into individual WLAs. The industrial stormwater WLA was set equal to the construction stormwater WLA.

MPCA's calculation of construction and industrial stormwater WLAs was based on their review of average construction activity within Douglas County. For the lake TMDL, the construction stormwater WLA was calculated as the construction stormwater percent area multiplied by the existing watershed load. It is assumed by MPCA that loads from permitted construction stormwater sites that operate in compliance with their permits are meeting the WLA.

Attaining the construction stormwater and industrial stormwater loads described in the phosphorus TMDL is the responsibility of construction and industrial site managers. In the final TMDL document MPCA explained that if a construction site owner/operator obtains coverage under the NPDES/SDS General Stormwater Permit (MNR100001) and properly selects, installs and maintains all BMPs required under MNR100001 and applicable local construction stormwater ordinances, including those related to impaired waters discharges and any applicable additional requirements found in Appendix A of the Construction General Permit, the stormwater discharges would be expected to be consistent with the WLA in this TMDL. BMPs and other stormwater control measures which act to limit the discharge of the pollutant of concern (phosphorus) are defined in MNR100001.

The MPCA is responsible for overseeing industrial stormwater loads which impact water quality to lakes in the Lake Winona and surrounding watersheds. Industrial sites within these lake subwatersheds are expected to comply with the requirements of the State's NPDES/SDS Industrial Stormwater Multi-Sector General Permit (MNR050000) or NPDES/SDS General Permit for Construction Sand & Gravel, Rock Quarrying and Hot Mix Asphalt Production facilities (MNG490000). MPCA explained that if a facility owner/operator obtains coverage under the appropriate NPDES/SDS General Stormwater Permit and properly selects, installs and maintains all BMPs required under the permit, the stormwater discharges would be expected to

be consistent with the WLA in this TMDL. BMPs and other stormwater control measures which act to limit the discharge of the pollutant of concern (phosphorus) are defined in MNR050000 and MNG490000.

The NPDES program requires construction and industrial sites to create SWPPPs which summarize how stormwater pollutant discharges will be minimized from construction and industrial sites. Under the MPCA’s Stormwater General Permit (MNR100001) and applicable local construction stormwater ordinances, managers of sites under construction or industrial stormwater permits must review the adequacy of local SWPPPs to ensure that each plan complies with the applicable requirements in the State permits and local ordinances. As noted above, MPCA has explained that meeting the terms of the applicable permits will be consistent with the WLAs set in the Lake Winona phosphorus TMDLs. In the event that the SWPPP does not meet the WLA, the SWPPP will need to be modified within 18-months of EPA’s approval of the TMDL. This applies to sites under permits for MNR100001, MNR050000 and MNG490000.

Table 5: Phosphorus WLAs for the Lake Winona TMDL (21-0081-00)

Facility	Permit	Average Wet Weather Design Flow (mgd)	Annual Average TMDL Concentration to meet TMDL (mg/L)	Total Phosphorus WLA (kg/day)	Total Phosphorus WLA (kg/yr)
ALASD	MN0040738	4.7	0.105	1.821	665
City of Alexandria Stormwater	MS400264	--	0.9	0.207	76.7
Construction Stormwater	MNR100001	--	0.9	0.005	1.7
Industrial Stormwater	MNR50000	--	0.9	0.005	1.7

EPA finds the MPCA’s approach for calculating the WLA for the Lake Winona phosphorus TMDL to be reasonable and consistent with EPA guidance.

6. Margin of Safety (MOS)

The statute and regulations require that a TMDL include a margin of safety (MOS) to account for any lack of knowledge concerning the relationship between load and wasteload allocations and water quality (CWA §303(d)(1)(C), 40 C.F.R. §130.7(c)(1)). EPA’s 1991 TMDL Guidance explains that the MOS may be implicit, i.e., incorporated into the TMDL through conservative assumptions in the analysis, or explicit, i.e., expressed in the TMDL as loadings set aside for the MOS. If the MOS is implicit, the conservative assumptions in the analysis that account for the MOS must be described. If the MOS is explicit, the loading set aside for the MOS must be identified.

Comment:

MPCA explained that the Lake Winona TMDL calculated a margin of safety by reducing the target for watershed runoff concentration (both regulated and non-regulated) from 100 µg/L to 90 µg/L (Sections 4.1.1.6, 4.3.3 and 4.4 of the final TMDL document). This was the concentration used in the WINSLAMM model to calculate the watershed runoff loading. MPCA

explained that this MOS is sufficient as the WINSLAMM model and the BATHTUB both show good correlation with observed conditions (Tables 8 and 12, Sections 3.5.2.1 and Appendix B of the final TMDL document). MPCA also noted that over 97% of the phosphorus load to Lake Winona is regulated under a NPDES permit, either for stormwater or wastewater discharge. The MOS is noted in Table 4 of this Decision Document.

The EPA finds that the TMDL document submitted by MPCA contains an appropriate MOS satisfying the requirements of the sixth criterion.

7. Seasonal Variation

The statute and regulations require that a TMDL be established with consideration of seasonal variations. The TMDL must describe the method chosen for including seasonal variations. (CWA §303(d)(1)(C), 40 C.F.R. §130.7(c)(1)).

Comment:

Seasonal variation was considered for the Lake Winona phosphorus TMDL via the nutrient targets which were based on the average nutrient values collected during the growing season (June 1 to September 30). The water quality targets were designed to meet the site specific criteria during the period of the year where the frequency and severity of algal growth is the greatest.

The Minnesota eutrophication standards state that total phosphorus WQS are defined as the mean concentration of phosphorus values measured during the growing season. In the Lake Winona nutrient TMDL effort, the LA and WLA estimates were calculated from modeling efforts which incorporated mean growing season total phosphorus values. Nutrient loading capacities were set in the TMDL development process to meet the site specific criteria during the most critical period. The mid to late summertime period is typically when eutrophication standards are exceeded and water quality within the Lake Winona is deficient. By calibrating the modeling efforts to protect these water bodies during the worst water quality conditions of the year, it is assumed that the loading capacities established by the TMDL will be protective of water quality during the remainder of the calendar year (October through May).

The EPA finds that the TMDL document submitted by MPCA satisfies the requirements of the seventh criterion.

8. Reasonable Assurance

When a TMDL is developed for waters impaired by point sources only, the issuance of a NPDES permit(s) provides the reasonable assurance that the wasteload allocations contained in the TMDL will be achieved. This is because 40 C.F.R. 122.44(d)(1)(vii)(B) requires that effluent limits in permits be consistent with, “the assumptions and requirements of any available wasteload allocation” in an approved TMDL.

When a TMDL is developed for waters impaired by both point and nonpoint sources, and the WLA is based on an assumption that nonpoint source load reductions will occur, EPA's 1991 TMDL Guidance states that the TMDL should provide reasonable assurances that nonpoint source control measures will achieve expected load reductions in order for the TMDL to be approvable. This information is necessary for EPA to determine that the TMDL, including the load and wasteload allocations, has been established at a level necessary to implement water quality standards.

EPA's August 1997 TMDL Guidance also directs Regions to work with States to achieve TMDL load allocations in waters impaired only by nonpoint sources. However, EPA cannot disapprove a TMDL for nonpoint source-only impaired waters, which do not have a demonstration of reasonable assurance that LAs will be achieved, because such a showing is not required by current regulations.

Comment:

The Lake Winona phosphorus TMDL provide reasonable assurance that actions identified in the implementation sections of the TMDL (i.e., Sections 6 and 8 of the final TMDL document) will be applied to attain the loading capacities and allocations calculated for Lake Winona. The recommendations and requirements made by MPCA will be successful at improving water quality if the appropriate local groups work to implement these recommendations.

Typical TMDL efforts address waterbodies impaired by both point and nonpoint sources. Lake Winona is unique in that the majority (60%) of the current load is from NPDES-regulated point sources, and once the TMDL is fully implemented over 93% of the pollutant load will be from NPDES-regulated sources. Therefore, the control of point sources will be critical to attaining water quality standards in Lake Winona.

WWTF: Reasonable assurance that the WLA set forth will be implemented is provided by regulatory actions. According to 40 C.F.R. 122.44(d)(1)(vii)(B), NPDES permit effluent limits must be consistent with assumptions and requirements of all WLAs in an approved TMDL. MPCA's NPDES permit program are the implementing programs for ensuring WLA are consistent with the TMDL. MPCA has recently reissued the NPDES permit for the ALASD WWTF (Appendix D of the final TMDL document).

The permit contains an Adaptive Lake Management Plan that targets actions and activities that the ALASD will be required to pursue to reduce phosphorus loads in the lake. This plan defers the implementation of strict phosphorous effluent limits while the plan is pursued. The efforts include tracking and removing carp in the lake, and a possible lake drawdown to re-establish aquatic vegetation and further address carp in the lake. The plan also addresses Lake Agnes, which is just downstream of Lake Winona. The first alum treatment in Lake Agnes occurred in September, 2020 (<https://alasdistrict.org/lake-management-information>).

MS4 Stormwater: The City of Alexandria has a SWPPP to address and control stormwater discharges in their jurisdiction (City of Alexandria, 2016). The city also has a stormwater ordinance to control stormwater in the city. All regulated MS4 entities are required to satisfy the requirements of the MS4 general permit. The MS4 general permit requires the permittee to

develop a SWPPP which addresses all permit requirements, including the following six minimum control measures:

- Public education and outreach;
- Public participation;
- Illicit Discharge Detection and Elimination (IDDE) Program;
- Construction-site runoff controls;
- Post-construction runoff controls; and
- Pollution prevention and municipal good housekeeping measures.

A SWPPP is a management plan that describes the MS4's activities for managing stormwater within their jurisdiction or regulated area. When a TMDL includes a WLA(s) for a MS4 entity(ies), the MS4 must identify the applicable WLA in its future permit application and identify BMPs to be implemented during the permit term to address the WLA (Section 6.2.3 of the final TMDL document).

The MPCA stormwater program also requires construction and industrial sites to create a SWPPP that summarizes how stormwater will be minimized from a site. Permittees are required to review the adequacy of their SWPPPs to ensure that each plan meets WLA set in the TMDL. In the event that the SWPPP does not meet the WLA, the SWPPP will need to be modified prior to the effective date of the next General Permit.

Other Actions: The Lake Winona watershed is in the Long Prairie River watershed (Section 6.3 of the final TMDL document). A TMDL was approved for the Long Prairie watershed in January 2017. The TMDL did not directly address Lake Winona, but the WRAPS document for the Long Prairie River addressed the entire watershed, and included Lake Winona. MPCA approved the WRAPS in April 2017. The WRAPS provides information on the development of scientifically-supported restoration and protection strategies for implementation planning and action. MPCA sees the WRAPS document as a starting point for which MPCA and local partners can develop tools that will help local governments, land owners, and special interest groups determine (1) the best strategies for making improvements and protecting resources that are already in good condition, and (2) focus those strategies in the best places to do work.

Various funding mechanisms will be utilized to execute the recommendations made in the implementation section of this TMDL. The Clean Water Legacy Act (CWLA) was passed in Minnesota in 2006 for the purposes of protecting, restoring, and preserving Minnesota water. The CWLA provides the protocols and practices to be followed in order to protect, enhance, and restore water quality in Minnesota. The CWLA outlines how MPCA, public agencies and private entities should coordinate in their efforts toward improving land use management practices and water management. The CWLA anticipates that all agencies (i.e., MPCA, public agencies, local authorities and private entities, etc.) will cooperate regarding planning and restoration efforts. Cooperative efforts would likely include informal and formal agreements to jointly use technical, educational, and financial resources.

The CWLA also provides details on public and stakeholder participation, and how the funding will be used. In part to attain these goals, the CWLA requires MPCA to develop WRAPS. The WRAPS are required to contain such elements as the identification of impaired waters,

watershed modeling outputs, point and nonpoint sources, load reductions, etc. ([Chapter 114D.26](#); CWLA). The WRAPS also contain an implementation table of strategies and actions that are capable of achieving the needed load reductions, for both point and nonpoint sources ([Chapter 114D.26](#), Subd. 1(8); CWLA). Implementation plans developed for the TMDLs are included in the table, and are considered “priority areas” under the WRAPS process ([Watershed Restoration and Protection Strategy Report Template](#), MPCA). This table includes not only needed actions but a timeline for achieving water quality targets, the reductions needed from both point and nonpoint sources, the governmental units responsible, and interim milestones for achieving the actions. MPCA has developed guidance on what is required in the WRAPS ([Watershed Restoration and Protection Strategy Report Template](#), MPCA).

The Minnesota Board of Soil and Water Resources administers the Clean Water Fund as well, and has developed a detailed grants policy explaining what is required to be eligible to receive Clean Water Fund money (http://bwsr.state.mn.us/cwf_programs).

The EPA finds that this criterion has been adequately addressed.

9. Monitoring Plan to Track TMDL Effectiveness

EPA’s 1991 document, *Guidance for Water Quality-Based Decisions: The TMDL Process* (EPA 440/4-91-001), recommends a monitoring plan to track the effectiveness of a TMDL, particularly when a TMDL involves both point and nonpoint sources, and the WLA is based on an assumption that nonpoint source load reductions will occur. Such a TMDL should provide assurances that nonpoint source controls will achieve expected load reductions and, such TMDL should include a monitoring plan that describes the additional data to be collected to determine if the load reductions provided for in the TMDL are occurring and leading to attainment of water quality standards.

Comment:

The final TMDL document outlines the water monitoring efforts in the Lake Winona in Section 7 of the final TMDL document. Lake monitoring has been performed by ALASD since 1980, and is required to continue under the NPDES permit (Section 7.1 and Appendix D of the final TMDL document). Minnesota Department of Natural Resources (MDNR) is scheduled to conduct fish surveys of the lake every seven years, which will coincide with the fish barrier project in Lake Winona. The City of Alexandria will also provide monitoring data and BMP installation data as part of the NPDES stormwater permit.

Progress of TMDL implementation will be measured through regular monitoring efforts of water quality and total BMPs completed. It is anticipated that Lake Winona will also be monitored once every 10 years as part of the MPCA’s Intensive Watershed Monitoring cycle.

The EPA finds that this criterion has been adequately addressed.

10. Implementation

EPA policy encourages Regions to work in partnership with States/Tribes to achieve nonpoint source load allocations established for 303(d)-listed waters impaired by nonpoint sources. Regions may assist States/Tribes in developing implementation plans that include reasonable assurances that nonpoint source LAs established in TMDLs for waters impaired solely or primarily by nonpoint sources will in fact be achieved. In addition, EPA policy recognizes that other relevant watershed management processes may be used in the TMDL process. EPA is not required to and does not approve TMDL implementation plans.

Comment:

The findings from the Lake Winona TMDL will be used to guide the implementation activities as part of the Lake Winona/Long Prairie WRAPS process. In addition to the WRAPS report, the ALASD permit will also target actions and activities to address phosphorus loads in Lake Winona.

Internal Loading: In addition to the point source efforts discussed in Section 8 of this Decision Document, MPCA also provided information on the internal loading issue in Lake Winona (Section 8.2.2 of the final TMDL document). Both Lake Winona and Lake Agnes have been identified by MPCA with significant problems due to carp and other rough fish. To attain the appropriate WQS, restoration of the lake fishery and macrophytes will be required. Controlling or eliminating carp will reduce the amount of sediment disturbance in the lake, which increase the release of sediment and phosphorus into the water column. Restoring native aquatic plants will improve the fishery, reduce sediment and phosphorus disturbance, and improve clarity in the lake (Section 8.2.2 of the final TMDL document).

Education and Outreach Efforts: Increased education and outreach efforts to the general public bring greater awareness to the issues surrounding pollutant contamination and strategies to reducing loading and transport of phosphorus. Education efforts targeted to the general public are commonly used to provide information on the status of impacted waterways as well as to address pet waste and wildlife issues. Education efforts may emphasize aspects such as cleaning up pet waste or managing the landscape to discourage nuisance congregations of wildlife and waterfowl. Education can also be targeted to municipalities, wastewater system operators, land managers and other groups who play a key role in the management of pollutant sources.

The EPA finds that this criterion has been adequately addressed. The EPA reviews but does not approve implementation plans.

11. Public Participation

EPA policy is that there should be full and meaningful public participation in the TMDL development process. The TMDL regulations require that each State/Tribe must subject calculations to establish TMDLs to public review consistent with its own continuing planning process (40 C.F.R. §130.7(c)(1)(ii)). In guidance, EPA has explained that final TMDLs submitted to EPA for review and approval should describe the State's/Tribe's public

participation process, including a summary of significant comments and the State's/Tribe's responses to those comments. When EPA establishes a TMDL, EPA regulations require EPA to publish a notice seeking public comment (40 C.F.R. §130.7(d)(2)).

Provision of inadequate public participation may be a basis for disapproving a TMDL. If EPA determines that a State/Tribe has not provided adequate public participation, EPA may defer its approval action until adequate public participation has been provided for, either by the State/Tribe or by EPA.

Comment:

Throughout the development of the Lake Winona TMDL the public was given various opportunities to participate. As part of the strategy to communicate the goals of the TMDL project and to engage with members of the public, MPCA worked with Douglas County, City of Alexandria and others to promote water quality, to gain input from landowners via surveys and interviews and to better understand the social dynamics of stakeholders in the Lake Winona area. In 2006, MPCA formed a Technical Advisory Committee (TAC) which included members of the public, MPCA, MDNR, Douglas County, City of Alexandria, and ALASD (Section 9.1 of the final TMDL document). Numerous meetings were held to discuss the development of the TMDL (Table 17 of the final TMDL document).

MPCA posted the draft TMDL online at (<http://www.pca.state.mn.us/water/tmdl>) for a public comment period. The public comment period was started on April 26, 2021 and ended on May 26, 2021. The MPCA received three comment letters and adequately addressed these comments.

The comments submitted to MPCA focused on the implementation of the WLAs for the point sources, and whether or not they were achievable. One commenter noted that to attain the WLAs in the TMDL, there would need to be close cooperation between the permitted entities and the MPCA, while two commenters were dubious that the WWTF upgrades would be effective. Another comment involved the baseline year and when existing stormwater practices would be credited.

MPCA explained that the cooperation is always encouraged to attain the WLAs, and the MPCA has developed a guidance on water quality trading that could be useful in exploring the various options between the entities. Regarding the baseline question, MPCA noted that the baseline becomes an issue when discussing percent reductions. MPCA explained that the WLAs are approved as daily loads, and it is important for the permittees to focus on the actual loadings into the lake.

EPA has determined that MPCA adequately addressed the comments received during the public notice period. All public comments and MPCA responses to publicly submitted comments were shared with EPA.

The EPA finds that the TMDL document submitted by MPCA satisfies the requirements of this eleventh element.

12. Submittal Letter

A submittal letter should be included with the TMDL submittal, and should specify whether the TMDL is being submitted for a *technical review* or *final review and approval*. Each final TMDL submitted to EPA should be accompanied by a submittal letter that explicitly states that the submittal is a final TMDL submitted under Section 303(d) of the Clean Water Act for EPA review and approval. This clearly establishes the State's/Tribe's intent to submit, and EPA's duty to review, the TMDL under the statute. The submittal letter, whether for technical review or final review and approval, should contain such identifying information as the name and location of the water body, and the pollutant(s) of concern.

Comment:

The EPA received the final Lake Winona TMDL, the submittal letter, and accompanying documentation from MPCA on July 7, 2021. The transmittal letter explicitly stated that the final TMDL referenced in Table 1 of this Decision Document was being submitted to EPA pursuant to Section 303(d) of the Clean Water Act for EPA final review and approval.

The letter clearly stated that this was a final TMDL submittal under Section 303(d) of CWA. The letter also contained the name of the waterbody as it appears on Minnesota's 303(d) list, and the causes/pollutants of concern. This TMDL was submitted per the requirements under Section 303(d) of the Clean Water Act and 40 C.F.R. 130.

The EPA finds that the TMDL transmittal letter submitted for the Lake Winona TMDL by MPCA satisfies the requirements of this twelfth element.

13. Conclusion

After a full and complete review, the EPA finds that the one phosphorus for Lake Winona satisfies all elements for an approvable TMDL. This TMDL approval is for **one (1) TMDL**, addressing Lake Winona for aquatic recreational use impairment (Table 1 of this Decision Document).

The EPA's approval of these TMDLs extends to the water bodies which are identified above with the exception of any portions of the water bodies that are within Indian Country, as defined in 18 U.S.C. Section 1151. The EPA is taking no action to approve or disapprove TMDLs for those waters at this time. The EPA, or eligible Indian Tribes, as appropriate, will retain responsibilities under the CWA Section 303(d) for those waters.

References

City of Alexandria, 2016. Stormwater Pollution Prevention Plan

Minnesota Pollution Control Agency, May 2011. Lake Winona site-specific standard for eutrophication (draft). 11 pp.

Wang, H., P. Weiss and J. Gulliver, January 2009. "Phosphorus Release from Sediments in Lake Winona", St. Anthony Falls Laboratory, University of Minnesota, Project Report No. 453.