



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

DEC 20 2017

REPLY TO THE ATTENTION OF:

WW-16J

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 has conducted a complete review of the final Total Maximum Daily Load (TMDL) and supporting documentation for Island Lake, located in the headwaters of the Big Fork River in north central Minnesota, in Itasca and Koochiching Counties. The TMDL addresses one nutrient impairment in Island Lake (ID 31-0913-00).

This TMDL meets the requirements of Section 303(d) of the Clean Water Act and EPA's implementing regulations at 40 C.F.R. Part 130. Therefore, EPA hereby approves Minnesota's TMDL. The statutory and regulatory requirements, and EPA's review of Minnesota's compliance with each requirement, are described in the enclosed decision document.

We wish to acknowledge Minnesota's effort in submitting this TMDL, and look forward to future TMDL submissions by the State of Minnesota. If you have any questions, please contact Mr. Peter Swenson, Chief of the Watersheds and Wetlands Branch, at 312-886-0236.

Sincerely,

A handwritten signature in blue ink, appearing to read "Chris Korleski".

Christopher Korleski
Director, Water Division

Enclosure

cc: Celine Lyman, MPCA
Mike Kennedy, MPCA

wq-iw10-08g

TMDL: Island Lake MN

Date: December 2017

DECISION DOCUMENT FOR APPROVAL OF THE ISLAND LAKE TMDL BIG FORK WATERSHED

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 Waterbody, Pollutant of Concern, Pollutant Sources, and Priority Ranking

The TMDL submittal should identify the waterbody as it appears on the State's/Tribe's 303(d) list. The waterbody 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 waterbody 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 waterbody. 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 waterbody 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 (chl-a) and phosphorus loadings for excess algae; length of riparian buffer; or number of acres of best management practices.

Comment:

Location Description/Spatial Extent: In the Executive Summary of the TMDL document, the Minnesota Pollution Control Agency (MPCA) states that it has developed a TMDL to address aquatic life and recreational use impairments by nutrients and by eutrophication biological indicators in Island Lake (ID 31-0913-00). The lake is located in north central Minnesota, in the northwest portion of Itasca County, and a portion in Koochiching County. It is a headwater lake in the Big Fork River Watershed, which flows generally northward to Canada, with Elmwood Island (covering 83 acres) located in the center of the lake, covering a total surface area of 3,108 acres.

The lake's watershed is located where there is greater gradient and poor drainage to the west, and a lower slope and moderately drained watershed in the eastern portion of the watershed. The poor to moderate drainage contributes to the overall wetland areas throughout the watershed. The western portion of the watershed has more rapid runoff, while the eastern portion has more steady runoff due to the more gradual change in gradient; further, the eastern portion's lower slopes and upland lakes (Williams and Welch Lakes) trap nutrients before they can enter Island Lake. There is an inlet stream flowing into the lake in the eastern portion of the watershed, as well as three ephemeral inlet streams. Outflow of water occurs into adjacent wetland areas from pulsing wetlands due to the succession of wet and dry periods. Section 3.3.2 of the TMDL submittal states that the predominant soil types in the eastern and western portions of the watershed are very different, with moderate and poor drainage, respectively. This TMDL calculated nutrient (phosphorus) loading for a total of one TMDL.

The lake is classified as a deep lake by MPCA (Table 1.1 in the TMDL), but responds as both a deep and shallow lake based on several quantitative characteristics, all of which affect water quality.

- Littoral zone - The deep lake category applies to the lake because its measured shallow (littoral) zone covers only 38% of the lake, while having 80% of the lake in the littoral zone would define it as shallow.
- Depth - The lake has an average depth of 15 feet (at the cutoff for the shallow/deep category) and a maximum of 35 feet, with little change or stratification at depth.
- Ratio of surface area: maximum depth - In Section 3.2 of the TMDL, MPCA states that the lake's geometry ratio of lake surface area/maximum depth is a shallow lake characteristic.
- Mixing volume - The Osgood Index estimates the fraction of a lake's volume involved in mixing, using the lake mean depth and its surface area. Island Lake is classified as polymictic (well-mixed shallow).

There are good fisheries in the lake for walleye and northern pike, and secondary species of yellow perch and cisco, with rough fish and invasive aquatic plants not occurring at this time

(Sections 3.6.2 and 7.1 of the TMDL). MPCA states that future management should continue to emphasize maintenance of the fisheries and prevention of invasive species or more tolerant fish.

Land Use: data for land use in the watershed from 2001 is shown in Table 3.2 of the TMDL, with 32.5% open water, 29.5% deciduous forest, 20.9% woody wetlands, 5.2% mixed forest, 3% developed, and less than 3% each of the following categories of: shrub scrub, emergent herbaceous wetlands, hay/pasture, evergreen forest, herbaceous, and low intensity development. There are no cultivated crops in the watershed.

Problem Identification: The Executive Summary of the TMDL submittal states that there are harmful algal blooms in the lake, caused by excess nutrients. There are no permitted sources in the area, but there is nonpoint loading to the lake, a significant amount of internal loading, as well as upland wetland phosphorus release. The release occurs depending on wetland types and substrates, past drainage and ditch activities, and dry/wet cycles in the wetlands. Section 3.3.1 in the TMDL states that there are many locations in the watershed with stream crossings and culverts, which can affect upstream hydrology and can cause potential erosion issues.

Pollutant of Concern: The pollutant of concern is nutrients (phosphorus), with allocations calculated for phosphorus.

Source Identification:

Point Sources (Section 3.8.1 of the TMDL)

There are recent construction stormwater sources, but they are not considered to be a significant source (#s C00019324, C00026732, and C00038768). The mean annual area under construction in Itasca County is 0.016% of the total area of the county

Nonpoint sources (Section 3.8.2 of the TMDL)

-Watershed: There are no major tributaries that flow into the lake, so loading is primarily from direct watershed loading. Land use and precipitation are the major variables contributing to watershed loading.

- Subsurface Sewage Treatment Systems (SSTs): estimates were used regarding the amount of homes in the area around Island Lake (158), then assumptions were made regarding persons per home, the number of residences with year-round occupancy, and the number with seasonal occupation. Data were roughly calculated on a county scale. There are no public sewer systems in the watershed.

- Atmospheric Deposition can be delivered to the lake either under wet conditions or dry deposition.

-Internal loading is a large component of the excess nutrients in the lake. Several processes are involved in the release of phosphorus from the sediments.

- Legacy loading can result in phosphorus being released depending on different aerobic and anaerobic conditions, or varied amounts of available iron.
- Resuspension of the physical particles of sediments also adds phosphorus to the system from fish, wind or waves. The smaller particles such as clay and silt are more easily resuspended and also have a greater total surface area per mass that enables them to hold much more phosphorus per unit mass (i.e., when compared to sand size).

Decay of dying curly leaf pondweed or other macrophytes at peak growth in the summer can rapidly increase phosphorus concentrations, increase pH, and contribute to low Dissolved Oxygen (DO) that can release phosphorus from sediment. However, these plants have not been reported in Island Lake.

Priority Ranking: MPCA prioritizes based on the impact impairments have on the public and aquatic life, the public value of the water resource, likelihood a TMDL can be completed, data availability, local capacity to assist with the TMDL, and MPCA's statewide rotating basin schedule (Section 1.3 of the TMDL).

Future Growth: Section 4.8 states that the area is not expecting substantial development that would warrant reserve capacity for wasteload allocations. Further, potentially expanding MS4s are not applicable for this TMDL (Section 5 of the TMDL). As a result, MPCA did not give an explicit allocation for future growth.

The EPA finds that the TMDL document submitted by the 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 waterbody, 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 - Island Lake is designated as a Class 2B and 3C water (MN R. 7050.0470). 2B and 3C. Section 2 of the TMDL states:

- Class 2 waters shall support “the propagation and maintenance of a healthy community of cool or warm water sport or commercial fish and associated aquatic life, and their habitats. These waters shall be suitable for aquatic recreation of all kinds...” [Minn. R. 7050.0222, subp. 4].

habitats. These waters shall be suitable for aquatic recreation of all kinds...” [Minn. R. 7050.0222, subp. 4].

- Beneficial use Class 3 corresponds to industrial consumption [Minn. R. 7050.0223, subp. 1].

Criteria - The criteria for Lake Nutrient/Eutrophication Standards in the Northern Lakes and Forest Ecoregion are from Minn. R. 7050.0222, subp. 4, for three parameters that are included in the standard:

- **Total Phosphorus (TP) \leq 30 $\mu\text{g/L}$ (ppb)**
- **Chl-a \leq 9 $\mu\text{g/L}$**
- **Secchi depth \geq 2 meters**

To demonstrate attainment of Water Quality Standards (WQS), all three parameters must meet criteria. MPCA determined that meeting the TP value will ensure that the chlorophyll-a and Secchi Depth will be met, based on past studies using a large amount of lake data.

The EPA finds that the TMDL document submitted by the 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 waterbody 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 loading capacity for TP for Island Lake is shown below, taken from the TMDL in Section 4.9. Reductions are all from the LA, with construction site stormwater included for any future WLA. *Note the TMDL table has some values marked with an asterisk (*) modified from the TMDL*

Island Lake Load Allocation		Existing TP Load		Allowable TP Load		Estimated Load Reduction	
		lbs/yr	lbs/day	lbs/yr	lbs/day	lbs/yr	%
Loading Capacity				2,765.1	7.58		
Margin of Safety				142.0	0.39		
Total Load		3,565.0	9.77	2,623.0	7.19	942.0	26
Wasteload	Total WLA	1.0	0.0028	1.0	0.0028	0	0
	<i>Construction Stormwater</i>	<i>1.0</i>	<i>0.0028</i>	<i>1.0</i>	<i>0.0028</i>	<i>0</i>	<i>–</i>
Total LA		3,564.0	9.76	2,622.0	7.18	942.0	26
Load	<i>Local Watershed</i>	<i>814.9</i>	<i>2.23</i>	<i>537.8</i>	<i>1.47</i>	<i>277.1</i>	<i>34</i>
	<i>SSTS</i>	<i>66.7</i>	<i>0.18</i>	<i>0*</i>	<i>0*</i>	<i>66.7*</i>	<i>100*</i>
	<i>Atmospheric deposition</i>	<i>535.2</i>	<i>1.47</i>	<i>535.2</i>	<i>1.47</i>	<i>0</i>	<i>–</i>
	<i>Internal load</i>	<i>2147.2</i>	<i>5.88</i>	<i>1549.0*</i>	<i>4.24*</i>	<i>598.2*</i>	<i>28*</i>
Total Load		3,565.0	9.77	2,623.0	7.19	942.0	26

* Values changed in the TMDL document because of calculation errors detected by EPA for SSTS. The modified values are acceptable to MPCA and EPA. No load allocation is given to SSTS, and that load was moved to internal loading based on site specific conditions in the lake regarding phosphorus release. No point source values changed.

The Minnesota Lake Eutrophication Analysis Procedure Modeling (MINLEAP) was used to determine whether the water quality in lakes was better or worse than expected, when comparing results on a regional level. Results showed Island Lake was worse than what should be expected, based on its mean depth, lake and watershed area, and location in the Northern Lakes and Forest ecoregion.

Several models were developed to determine the loading capacity. The Hydrologic Simulation Program FORTRAN (HSPF) was used to model the watershed for runoff and flow weighted mean concentrations that could be input to the lake model BATHTUB. Measured discharge values were observed from 1996 through 2014. Section 4.2.1 of the TMDL stated that there was good agreement of the simulated to observed values, with two flow gages' observed and simulated data differences at -3.96 and 5.80% when using HSPF simulation. The gage locations were at Bigfork River approximately seven miles northwest of Craigville, Minnesota, and at Big Falls, Minnesota, respectively.

concentration, the inputs are precipitation, lake surface evaporation, change in storage volume, atmospheric pollutant deposition and internal loading release rates.

- The inputs for SSTs loading calculations in Section 4.2.3 of the TMDL were completed using a desktop analysis, and included the number of homes, number of occupants in the home (using 2009 through 2013 averages for the county), whether people reside there year-round or part-time, and compliance rates of the SSTs. A statewide noncompliance rate of 20% was used, based on MPCA data from 2013. The septic loading was separated out and adjusted from the tributary and lakeshed flow volumes and loads modeled in HSPF.
- Atmospheric loading was input to the model using average annual total atmospheric deposition. The dry and wet years had a difference of approximately $\pm 7\%$ from average years (Section 4.2.4 of the TMDL).
- Internal loading from the lake is one of the largest load contributors in this TMDL. Internal loading was reviewed in more detail with respect to: 1) anaerobic and aerobic conditions; 2) growing season conditions; and 3) mass balance equations.
 - o The Nürnberg equation was used for determining release rates of phosphorus from sediment, based on sediment cores from the Lake of the Woods area, comparing aerobic and anaerobic release rates with varying temperature. Phosphorus release rates increased exponentially under anaerobic conditions at higher temperatures. Measurements from the early 1990s suggest that more internal loading may occur at depth where sediments encounter more anoxic conditions.
 - o Phosphorus concentration values typically increase in the summer, approximately doubling, and although there are some external sources, they are primarily internal. The runoff in the summer timeframe in the growing season should be decreased because of vegetation canopies and evapotranspiration (Section 4.2.5.2 of the TMDL).
 - o A mass balance was calculated on the “unexplained residual” where the internal and external phosphorus loading did not balance; this residual is not considered a large contributor to the loading. There is a good convergence between growing season load estimates and mass balance load estimates that did not indicate a high summer release rate from internal anaerobic processes, but rather from internal aerobic processes (Section 4.2.5.3 of the TMDL).

Critical Conditions: MPCA determined, as discussed in Section 4.7 of the TMDL, that the warmer summer conditions from June through September are taken into account. Greater peak flow events and large storms occur in this timeframe, and greater algal growth occurs due to higher temperatures. Further, this timeframe is taken into account when Minnesota developed its standards; they include chlorophyll-a and Secchi depth as related to internal phosphorus release. The TMDL allocations were developed based on the standards and summer critical conditions.

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

4. Load Allocations (LAs)

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:

The load allocation is shown above in Table 4.2, Section 4.9 of the TMDL, for Island Lake and requires an overall 26% reduction of the existing load. Individual loads and reductions were calculated for SSTS (100%), internal load (28%), local watershed load (34%), and atmospheric deposition (0%).

The EPA finds that the TMDL document submitted by the 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:

MPCA has only developed construction stormwater wasteload allocations for this TMDL, as shown in Table 4.2 above. Based upon a review of construction permits in the area, MPCA

Comment:

MPCA has only developed construction stormwater wasteload allocations for this TMDL, as shown in Table 4.2 above. Based upon a review of construction permits in the area, MPCA estimates 1% of the load to be contributed from construction activities. There are no other permitted facilities in the watershed.

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

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:

Section 4.5 of the TMDL submittal states that MPCA allocated 5% of the loading capacity as an explicit MOS for the TMDL. The MPCA expects this will account for uncertainty in calculations made for the TMDL. The MPCA believes this allocation will ensure achievement of the water quality standards because of the extensive field work completed in this watershed, and modeling had good convergence of values in estimating internal loading for the lake. EPA concurs that there was good convergence of values for phosphorus as simulated and observed values are listed in Table C-2 of the TMDL submittal.

The EPA finds that the TMDL document submitted by the MPCA satisfies 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:

MPCA considered seasonal variation by evaluating the loading in varied time intervals including both the growing season and annually, as well as reviewing impacts of temperature on phosphorus release (Section 4.2.5.1). Variations in temperature in different seasons were considered when calculating the loads due to temperature effects on phosphorus release from

lake sediments, and under both aerobic and anaerobic conditions. Warmer summer temperatures can also influence higher algal growth rates (Section 4.7).

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

8. Reasonable Assurances

When a TMDL is developed for waters impaired by point sources only, the issuance of a National Pollutant Discharge Elimination System (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:

Section 6.1 of the TMDL states that there are Big Fork Watershed Restoration and Protection Strategy (WRAPS) processes in progress to support local groups. Local, state and federal groups have worked together in the area for over 30 years. Characterization of the watershed includes baseline and long-term monitoring. The MPCA and several labs and universities have worked on sensitivity analyses for lakes in the area, as well as the DNR and Itasca Soil and Water Conservation District. This interaction and work provides a strong foundation for future projects to protect and restore the lakes in the area.

Clean Water Legacy Act (CWLA) - The CWLA was passed in Minnesota 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

The CWLA also provided 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).

<https://www.pca.state.mn.us/sites/default/files/wq-ws4-03.docx>). 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 action. MPCA has developed guidance on what is required in the WRAPS. The WRAPS for the Big Fork River is a work in progress and its status may be accessed at <https://www.pca.state.mn.us/water/watersheds/big-fork-river#restoration>.

In an update described in this TMDL, Minnesota voters approved the CWLA amendment in 2008, which increased the state sales and use tax rate by three-eighths of 1% on all taxable sales, starting July 1, 2009, and continuing through 2034. Approximately one third of the funds have been dedicated to a Clean Water Fund to, “protect, enhance, and restore water quality in lakes, rivers, streams, and groundwater, with at least 5% of the fund targeted to protect drinking water sources.” (MPCA 2014). Funding for implementation is also available through other nonpoint source programs and the 319 funding mechanism.

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

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:

In Section 7 of the TMDL, MPCA identified several major objectives of the monitoring of the Lake, including trend detection, performance of projects, and compliance with surface and ground water quality standards. Total phosphorus, chlorophyll-a, Secchi depth, temperature and dissolved oxygen would be included in the strategy, as well as measuring aspects of internal loading for a better understanding of its influence on loading. Diffusive phosphorus fluxes from sediment and equilibrium phosphorus fluxes from resuspension of sediment would be studied.

Determining what fractions of sediment phosphorus would be recyclable versus stable and buried would also be objectives of the monitoring and studies. Weather tracking would be considered in relation to the storm system contributions to variability in internal loading.

Streams would be monitored, especially during summer storm events, for both nutrients and sediment. Culverts and control structures are very important in this area and have a large influence on erosion, or on transport of water and sediment, and MPCA states that it would be beneficial for structures to have their inventories updated (Section 7.2 of the TMDL).

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

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:

Section 8 of the TMDL identifies implementation actions that would result in achieving the TMDL reductions. Permitted sources are very limited, and only include three areas subject to current construction stormwater permits. Therefore, any actions would primarily address nonpoint or nonpermitted sources. Future compliance of SSTS would be one of the actions, as well as buffers at the shore (Section 8.2.2 of the TMDL), landscape designs, lake association education, and follow up inspection. All of these actions, especially on shore lands and upland sources, also relate to the reductions necessary to reduce internal lake loading.

Internal lake loading implementation (Section 8.2.4 of the TMDL) includes possible introduction of iron to reduce sediment release rates of phosphorus. Further, high oxygen depletion occurs with high chlorophyll-a concentrations, which could be abated with installation of oxygenation pumps and systems in the lake bottom and on land.

Whole lake treatment with alum could be successful for 10-30 years, but may be less effective in shallow portions of the lake that may be influenced by wind mixing. Cost estimates were included in this Section, from \$300,000 to as much as \$2 million. Any adaptive management components of this effort would include the design strategy, implementation, monitoring, evaluating, and assessing the progress that may yield a change in strategy in the next phase of reductions.

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

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

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:

Public participation in the Island Lake watershed has been ongoing for over 20 years. The Itasca and Koochiching SWCDs have taken the lead, with participation by the Island Lake Association, DNR fisheries and hydrology departments, US Forest Service, the Big Fork River Board, and MPCA. Three meetings occurred within the Big Fork River Watershed to discuss Island Lake and TMDL development and modeling with the public.

The SWCDs presented information to the stakeholders during three meetings between 2010 and 2014, and the draft TMDL was on public notice between May 30, 2017 and June 29, 2017. Two letters from the public were received during the public notice period; one letter was supportive that the MPCA was including partnership with conservation professionals and using forest activities that would prevent erosion. The other letter was from the MN DNR regarding the WRAPS work in progress, suggesting that good forest management was also critical in reducing impacts on peak stream flow and could positively influence water conditions. Suggestions for actions and timing of BMPs were included in the letter, along with a website for reference. There were also suggestions related to invasive species and a request for greater consideration of rare species, and that these species should be identified in considering the prioritization of projects. Continued communication with the DNR was encouraged. MPCA adequately addressed all comments, including those from EPA in the pre-notice draft.

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

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 waterbody, and the pollutant(s) of concern.

Comment:

EPA received a submittal letter dated October 12, 2017, signed by Glenn Skuta, MPCA Watershed Division Director, addressed to Christopher Korleski, EPA Region 5, Water Division Director. The submittal letter identified the name and location of the waterbody for which the TMDL was developed. The letter stated that the Island Lake TMDL is being submitted for final approval by USEPA under Section 303(d) of the Clean Water Act.

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

13. Conclusion

After a full and complete review, the EPA finds that the TMDL for Island Lake Watershed for Total Phosphorus meets all of the required elements of an approvable TMDL. This decision document addresses pollutants in Island Lake (ID# 31-0913-00) listed on MPCA's 2010 303(d) list.

EPA's approval of this TMDL does not extend to those waters that are within Indian Country, as defined in 18 U.S.C. Section 1151. EPA is taking no action to approve or disapprove TMDLs for those waters at this time. EPA, or eligible Indian Tribes, as appropriate, will retain responsibilities under the CWA Section 303(d) for those waters.

ERRATA SHEET

This errata sheet lists errors and their correction for the Island Lake Nutrient Total Maximum Daily Load, in the Big Fork River Watershed – October 2017 from the Minnesota Pollution Control Agency **wq-iw10-08e**

Location	Error	Correction
P. 36, section 4.6 “Load Allocation Methodology” <i>**This content describes Table 4.2, which changed. Therefore, the content needed to be changed</i>	This corresponds to a load of 537.8 lbs/yr, a 34% reduction in loading from the watershed. A reduction in septic system TP concentration and loading of 25% (from 10 mg/L to 7.5 mg/L) is proposed, with an assumption of no change in discharge. The remaining load reduction comes from internal loading; the required release rate to satisfy the loading capacity is 0.148 mg/m ² /day. This corresponds to an internal loading reduction of 648.2 lbs/yr, or 30% reduction.	This corresponds to a load of 537.8 lbs/yr, a 34 percent reduction in loading from the watershed. The TMDL assumes complete (100%) future compliance with SSTS regulations with an assumed annual load of zero pounds per year. The remaining load reduction comes from internal loading; the required release rate to satisfy the loading capacity is 0.152 mg/m ² /day. This corresponds to an internal loading reduction of 598.2 lbs/yr, or 28 percent reduction.

In addition Table 4.2 has been changed This is the “old” table:

Island Lake Load Allocation		Existing TP Load		Allowable TP Load		Estimated Load Reduction	
		lbs/yr	lbs/day	lbs/yr	lbs/day	lbs/yr	%
Loading Capacity				2,765.1	7.58		
Margin of Safety				142.0	0.39		
Total Load		3,565.0	9.77	2,623.0	7.19	942.0	26
Wasteload	Total WLA	1.0	0.0028	1.0	0.0028	0	0
	<i>Construction Stormwater</i>	<i>1.0</i>	<i>0.0028</i>	<i>1.0</i>	<i>0.0028</i>	<i>0</i>	<i>–</i>
Load	Total LA	3,564.0	9.76	2,622.0	7.18	942.0	26
	<i>Local Watershed</i>	<i>814.9</i>	<i>2.23</i>	<i>537.8</i>	<i>1.47</i>	<i>277.1</i>	<i>34</i>
	<i>SSTS</i>	<i>66.7</i>	<i>0.18</i>	<i>50.0</i>	<i>0.14</i>	<i>16.7</i>	<i>25</i>
	<i>Atmospheric deposition</i>	<i>535.2</i>	<i>1.47</i>	<i>535.2</i>	<i>1.47</i>	<i>0</i>	<i>–</i>
	<i>Internal load</i>	<i>2147.2</i>	<i>5.88</i>	<i>1,499.0</i>	<i>4.10</i>	<i>648.2</i>	<i>30</i>
Total Load		3,565.0	9.77	2,623.0	7.19	942.0	26

The “new” table 4.2 is:

Island Lake Load Allocation		Existing TP Load		Allowable TP Load		Estimated Load Reduction	
		lbs/yr	lbs/day	lbs/yr	lbs/day	lbs/yr	%
Loading Capacity				2,765.1	7.58		
Margin of Safety				142.0	0.39		
Total Load		3,565.0	9.77	2,623.0	7.19	942.0	26
Wasteload	Total WLA	1.0	0.0028	1.0	0.0028	0	0
	<i>Construction Stormwater</i>	<i>1.0</i>	<i>0.0028</i>	<i>1.0</i>	<i>0.0028</i>	<i>0</i>	<i>–</i>
Load	Total LA	3,564.0	9.76	2,622.0	7.18	942.0	26
	<i>Local Watershed</i>	<i>814.9</i>	<i>2.23</i>	<i>537.8</i>	<i>1.47</i>	<i>277.1</i>	<i>34</i>
	<i>SSTS</i>	<i>66.7</i>	<i>0.18</i>	<i>0</i>	<i>0</i>	<i>66.7</i>	<i>100</i>
	<i>Atmospheric deposition</i>	<i>535.2</i>	<i>1.47</i>	<i>535.2</i>	<i>1.47</i>	<i>0</i>	<i>–</i>
	<i>Internal load</i>	<i>2147.2</i>	<i>5.88</i>	<i>1549.0</i>	<i>4.24</i>	<i>598.2</i>	<i>28</i>
Total Load		3,565.0	9.77	2,623.0	7.19	942.0	26

These changes have been made to the Island Lake TMDL document.