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

NOV 13 2013

REPLY TO THE ATTENTION OF:
WW-16J

Rebecca J. Flood, Assistant Commissioner
Regional Environmental Management Division
Minnesota Pollution Control Agency
520 Lafayette Road North
St. Paul, Minnesota 55155-4194

Dear Ms. Flood:

The U.S. Environmental Protection Agency has conducted a complete review of the final Total Maximum Daily Load (TMDL) for Sauk Lake-North Bay in central Minnesota (ID#77-0150-02), including supporting documentation and follow up information. The TMDL was calculated for Total Phosphorus. The designated use impairment in the lake is aquatic recreational use. Sauk Lake – North Bay is classified as a Class 2B water and is defined as and protected for aquatic life (warm and cool water fisheries and associated biota) and recreation (all water recreation activities including bathing).

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 for total phosphorus. 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,

Tinka G. Hyde
Director, Water Division

Enclosure

cc: Jeff Risberg, MPCA
Greg Van Eeckhout, MPCA

**TMDL:** Sauk Lake - North Bay Minnesota TMDL
**Date:** November 2013

# DECISION DOCUMENT FOR THE APPROVAL OF THE SAUK LAKE - NORTH BAY MINNESOTA TMDL

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 and phosphorus loadings for excess algae; length of riparian buffer; or number of acres of best management practices.

Comment:
Location Description/Spatial Extent: The Sauk Lake - North Bay TMDL document was submitted by the Minnesota Pollution Control Agency (MPCA). The project is located in central Minnesota, northwest of Minneapolis and St. Paul in the upper Mississippi River Basin in Douglas, Pope, Stearns, and Todd Counties. The entire watershed covers 557 $km^2$, which includes the Lake Osakis watershed (359 $km^2$) upstream, with an outlet to the Sauk River watershed (145 $km^2$), which then flows downstream to the south and east to the Sauk Lake – North Bay watershed (52.7 $km^2$). In June of 2013 MPCA completed a TMDL for Lake Osakis.

Sauk Lake was separated into two segments based on the different characteristics of each portion of the lake. The North Bay is deeper and flows into the shallower Sauk – Southwest Bay. This project is for one total phosphorus (TP) TMDL in the North Bay of Sauk Lake, ID #77-0150-02.

The lake is classified as a deep water lake, 19 meters at its deepest, located in the North Central Hardwood Forest Ecoregion. The Geology and Soils Section of the TMDL states that the area has many glacial deposits, including till, drift and outwash, primarily composed of sands and gravel. Most of the soils are sandy or loamy, and at the surface is a flat to rolling savannah of prairie grass and oak. Other soils that include till and drift are often poorly-drained clays and silts that result in wetlands.

Land Use: The Land Use Section of the TMDL states that the land use is primarily tilled agriculture, including, pasture, and grasslands, resulting in 71% of the land use being agricultural. Wetlands and forest comprise 15% of the land, lakes 8%, and developed areas < 1%. There is also nearshore development, including 377 homes within 100 meters of Sauk Lake – North Bay.

Problem Identification: The Problem Identification Section of the TMDL states that excessive nutrients (TP) impair the aquatic recreation designated use of Sauk Lake-North Bay. There are indications that TP may be decreasing over time when summertime means are compared, and especially in the last several years of measurement, the values presented in the TMDL almost meet phosphorus standards. Chlorophyll-a also shows a decreasing trend in recent years but all samples are above standards. However, Secchi depth trends show no significant change from 1987-2007.

MPCA indicates that phosphorus values in summer months meet standards in early summer, but the values increase and exceed standards by greater amounts as the summer progresses. Further,

the summer average value is above standards. MPCA states there is an influx of TP in the spring, then large increases of TP in the summer after July when the lake sediments release phosphorus into the water column and exceed standards. In the Nutrient Source Assessment Section of the TMDL, MPCA states the primary external sources are tributaries and contributions from the local watershed, followed by the seasonal internal loading later in summer.

Temperature and dissolved oxygen were profiled in the lake to better understand the internal loading. The lake depth plays a role because the presence or absence of a thermocline (horizontal plane in a thermal stratified lake at the depth where temperature decreases most rapidly, in this lake at about 8-10 meters depth) results in either stratification or mixing of the lake, depending on the time of year. Phosphorus is retained or released based on the temperature and therefore affects the phosphorus concentration. The example from a 2007 profile indicates a distinct thermocline and very low (near zero) DO at depth develops early in summer through August, and mid-July to early September both the mixing of zones and warmer temperatures occur. A dramatic occurrence of mixing of the vertical column in August results in the introduction of phosphorus released from bottom sediments in anoxic conditions, and possible resultant algal blooms. Overall early September has less stratification than July and by mid-Sept there is no thermocline.

Pollutant of Concern: The pollutant of concern is excess nutrients (phosphorus), along with chlorophyll-a and Secchi depths not meeting standards. Minnesota standards for phosphorus include that both chlorophyll-a and Secchi depth values must be met with phosphorus values to achieve standards.

Source Identification: The Nutrient Source Assessment Section of the TMDL states that nonpoint sources contribute to elevated phosphorus conditions in the lakes, and there are no point sources in the watershed. There are no permittees within the watershed subject to either MPCA's general construction or industrial stormwater permits, but their potential contribution is included in the TMDL at 0.1% for future growth.

The nonpoint sources are described below. The sources include:

- Atmospheric deposition - includes particulates settling out of the atmosphere to surface waters; the loading rate is assumed but corresponds to other loadings determined by BATHTUB modeling. The deposition is considered to be either directly out of the atmosphere during precipitation, or a portion of stormwater runoff; each are represented in the load contributions of the TMDL, but comprise less than 1% of the total load.
- Internal loading – is a significant portion of the current existing load. Internal loading refers to phosphorus recycling and re-suspension into the water column from lake bed sediments and organic matter, and occurs by release from bottom sediments during anoxic conditions. A range of loading rates was determined by analyzing 22 sediment cores in Sauk Lake.
- Groundwater – MPCA conducts ambient ground water monitoring, and determined that the surficial aquifer in the Sauk Lake area adds phosphorus loads to the lake. Sauk Lake - North Bay is a local sink for the surficial aquifer. Modeling for wellhead protection

estimated groundwater flows and phosphorus loading from the surficial aquifer into the lake; overall, groundwater contributes less than 1% of the load.

- Septic systems – There are 377 septic systems within 300 feet of the North Bay. During the mid 1990's, a survey by the Sauk River Watershed District (SRWD), which monitors and permits septic systems, showed that 70% of the systems around Sauk Lake were out of compliance. Since that time, all the lake shore property septic systems in the city of Sauk Centre have been hooked up to a sewer system. Those systems identified in the survey outside the city limits are now in compliance. They cannot discharge to surface waters and have an allocation of zero load contributing to the TMDL.
- Tributary – the Sauk River is the largest load contributing to the lake. The river runs from the outlet of Lake Osakis to the inlet of Sauk Lake – North Bay. The river has several small lakes within it that drain agricultural areas and are all shallow, eutrophic, and impaired for aquatic use. Although Mud Lake and wetlands directly upstream from Sauk Lake have a buffering effect on the hydrology and contaminants that enter Sauk Lake, the TP standard of 40ug/l is almost always exceeded in Sauk Lake –North Bay.
- Local watershed runoff –an export coefficient was derived for the Sauk River watershed from Lake Osakis to North Bay and applied to the local watershed. The value is comparable to past values calculated and total loading was determined by using the amount of hectares drained in the overland phosphorus transport.

Priority Ranking: The Reasonable Assurance Section of the TMDL states that the Stearns County Comprehensive Local Water Management Plan and the Sauk River Watershed District Watershed Management Plan have goals of improving water quality and achieving water quality standards. The county and watershed district have a strong interest in completion of this TMDL as a priority for the watershed and for MPCA, in order to provide the framework to proceed with implementation.

Future growth: The Reserve Capacity Section of the TMDL states that the population is stable with no expected growth. MPCA set aside 0.1 percent of the total watershed load to both industrial stormwater and construction stormwater.

EPA finds that the TMDL document submitted by MPCA satisfies all requirements concerning this first element.

## 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 Use: The Target Identification and Determination of Endpoints Section states that the lake is classified as Class 2B for aquatic recreation (swimming). MN Rules Chapter 7050.0140, Subpart 3, Water Use Classification for Waters of the State for Class 2 waters, aquatic life and recreation, states: "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."

Class 2B is defined in Minn. Rules 7050.0222, Subp. 4 as follows: "The quality of Class 2B surface waters shall be such as to permit 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, including bathing, for which the waters may be usable…."

Standards: Minnesota uses both the size of the waterbody (shallow or deep) and its ecoregional location to determine standards for a waterbody. Three criteria are included in the nutrient standards, total phosphorus (the causal factor), chlorophyll-a, and Secchi disc depth (response factors). MN R. 7050.0222(4) defines the numeric criteria shown below in Table 3. Sauk Lake-North Bay is categorized as a deep lake.

**Table 3. MPCA Goals for Protecting Class 2B Waters Values are Summer Averages (June-September)**

| | North Central Hardwood Forest Ecoregion[1] |
|---|---|
| **Parameters** | **Deep lakes[2]** |
| **Total Phosphorus (µg/L)** | 40 |
| **Chlorophyll-a (µg/L)** | 13 |
| **Secchi Depth (m)** | >1.5 |

[1] Values are Summer Averages (June 1 through September 30)
[2] Deep lakes are defined as lakes with a maximum depth of more than 15 ft, and with less than 80% of the lake shallow enough to support emergent and submerged rooted aquatic plants (littoral zone).

EPA finds that the TMDL document submitted by MPCA satisfies all requirements concerning this second element.

### 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:
TMDL = Loading Capacity (LC) = WLA + LA + MOS (Table 12 from the TMDL). The loading capacities calculated for the WLAs are for construction and industrial stormwater permits for future growth since there are currently no permitted locations in the watershed. The LAs are Sauk River (tributary load), atmospheric, local watershed, groundwater, and internal lake load.

**Methodology** – In the Linking Water Quality Targets and Sources Section of the TMDL, several methods are discussed that were used to develop the TMDL.

- Lake data - There were not enough data to represent the lake or compare year to year (sampling timeframe from June - September), therefore data from 2002-2007 were averaged and input as lake observations.
- River data - FLUX modeling was used for river input using river data from the same time period as the lake data, to estimate the annual flow weighted mean concentration.
- BATHTUB is a steady state model that uses a mass balance approach to estimate lake responses to nutrient inputs from external sources. The model uses water quality and water quantity inputs from tributaries, watershed runoff, groundwater and atmospheric sources, and observed lake water quality to predict nutrient concentrations. Results are

simulated summer mean water quality values in the epilimnion of the lake. Canfield Bachman equations were used within BATHTUB for phosphorus calculations; nitrogen was not calculated. The Nürnberg equation was used to account for internal lake loading.

- Scenarios were developed to include pre-settlement loading contributions, existing conditions, several TP internal lake and external reduction goals, and with /without a margin of safety. The scenarios are included in the appendices of the TMDL submittal.
- Regression equations were used to determine the relationships of response factors to increased nutrients, i.e., increased chlorophyll-a and decreased water clarity as measured by Secchi depth, due to algal growth as a response to excess nutrients.

**Table 12. TMDL total phosphorus daily loads partitioned among the major sources for Sauk Lake - North Bay**

| Allocation | Source | Existing TP Load | | TP Allocations (WLA & LA) | | Load Reduction | |
|---|---|---|---|---|---|---|---|
| | | (kg/year) | (kg/day) | (kg/year) | kg/day) | (kg/year) | Percent |
| Wasteload | Industrial and Construction Stormwater | 15.2 | 0.04 | 15.2 | 0.04 | 0 | 0% |
| Load | Sauk River | 8,008 | 21.9 | 6,240 | 17.1 | 1,768 | 22% |
| | Atmospheric | 69 | 0.19 | 69 | 0.19 | 0 | 0% |
| | Local watershed | 2061 | 5.6 | 828 | 2.3 | 1,233 | 60% |
| | Groundwater | 116 | .32 | 116 | .32 | 0 | 0% |
| | Internal Load | 2,312 | 6.33 | 301 | 0.82 | 2,011 | 87% |
| | MOS | -- | -- | 541 | 1.48 | -- | -- |
| | Total w/o MOS | 12,581 | 34.5 | 7,569 | 20.7 | 5,012 | 40% |
| | TOTAL LOAD | 12,581 | 34.5 | 8,110 | 22.2 | -- | -- |

Critical Conditions: The Seasonal and Annual Variation Section of the TMDL states that the critical condition is accounted for in the modeling effort because all seasonal conditions were incorporated into the process using six years of data for both hydrology and nutrients. The critical season is the summer growing season when the lakes experience the most algal blooms.

EPA finds MPCA's approach for calculating the LC to be reasonable and consistent with EPA guidance. EPA finds that the TMDL document submitted by MPCA satisfies all requirements concerning this third element.

## 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 Allocations are presented in Table 12 above in the previous section. The loading includes the river, atmospheric deposition, the local watershed, groundwater, and internal load.

EPA finds MPCA's approach for calculating the LA to be reasonable and consistent with EPA guidance. EPA finds that the TMDL document submitted by MPCA satisfies all requirements concerning this fourth element.

## 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 permitees 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:
The Waste Load Allocations are presented in Table 12 above in the previous section. Though the watershed has no permitted industrial or construction permits, the waste load includes aggregated values for any anticipated future changes in the watershed.

EPA finds MPCA's approach for calculating the WLA to be reasonable and consistent with EPA guidance. EPA finds that the TMDL document submitted by MPCA satisfies all requirements concerning this fifth element.

## 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:
An explicit 5% MOS was used in the modeling effort. MPCA set aside 5% of the phosphorus standard in the lake, 38µg/l rather than the 40µg/l standard, for the modeling goal. This resulted in a 6.7% MOS when calculating loading. MPCA believes the MOS is appropriate because there were comparable simulated and observed TP concentration values. The allocation methods included relevant processes, such as internal lake loading, to more accurately simulate the loading.

EPA finds MPCA's approach for calculating the MOS to be reasonable and consistent with EPA guidance. EPA finds that the TMDL document submitted by MPCA satisfies all requirements concerning this sixth element.

## 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 in this TMDL as described in the Seasonal and Annual Variation Section of the TMDL. Six years of data were used, representing a wide range of hydrological conditions. The MPCA takes this variation into account and load reductions are to meet standards over a wide range of climatic conditions. The greatest potential for algal blooms is in the summer months when nutrient levels are high, and these conditions are accounted for in the calculations.

EPA finds that the TMDL document submitted by MPCA satisfies all requirements concerning this seventh element.

## 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:
MPCA states in the Reasonable Assurance Section of the TMDL that many of the goals of the TMDL are consistent with other entities in the area. The funding comes from these entities, and the Conservation Reserve Program, the Section 319 program, local government cost share funds, and ear-marked funds from the Clean Water Legacy Act (CWLA) further described below.

Several Agencies are active and prepared to continue with the funding for water resources management. SRWD roles include: collection of monitoring data, permit programs (for redevelopment of property, land disturbance, work in the Right of Way of any legal drainage system, work on water control structures, and diversion of water to a different drainage system), technical assistance, implementation of capital improvements, and public education. The SRWD is also planning to update its rules to better integrate policies on stormwater runoff management, erosion control, drainage and water use.

The Stearns County Comprehensive Water Management Plan (WMP) goal is for waters to achieve standards and remove them from the impaired waters list. This TMDL was one of the top three priorities in the plan, applicable to the 2008-2017 timeframe. The important areas highlighted in the plan are: cooperation of watershed districts with the MPCA, education of feedlot owners regarding manure storage and application, providing information and assistance on soil erosion, stream bank protection and improvement of water resources, active promotion of funding programs, promotion of conservation programs, proper use and abandonment of manure

pits, inspection and compliance of feedlots, establishment of buffers on ditches, and establishment and maintenance of buffers in accordance with existing ordinances.

The Stearns County Soil and Water Conservation District is involved in implementation to reduce or prevent erosion, sedimentation, siltation and agricultural-related pollution; practices include grassed waterways, on-farm terracing, erosion control structures, and flow control structures. The SWCD also works closely with other agencies to promote and fund projects using cash incentives.

The CWLA is a statute passed in Minnesota in 2006 for the purposes of protecting, restoring, and preserving Minnesota water. The CWLA provides the process to be used in Minnesota to develop TMDL implementation plans, which detail the restoration activities needed to achieve the allocations in the TMDL. The TMDL implementation plans are required by the State to obtain funding from the Clean Water Fund. The Act discusses how MPCA and the involved public agencies and private entities will coordinate efforts regarding land use, land management, water management, etc. Cooperation is also expected between agencies and other entities regarding planning efforts, and various local authorities and responsibilities. This would also include informal and formal agreements and to jointly utilize technical educational, and financial resources. MPCA expects the implementation plans to be developed within a year of TMDL approval.

The CWLA also provides details on public and stakeholder participation, and how the funding will be used. The implementation plans are required to contain ranges of cost estimates for both point and nonpoint source load reductions, as well as monitoring efforts to determine effectiveness. MPCA has developed guidance on what is required in the implementation plans (Implementation Plan Review Combined Checklist and Comment, MPCA), which includes cost estimates, general timelines for implementation, and interim milestones and measures. 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 (FY '11 Clean Water Fund Competitive Grants Policy; Minnesota Board of Soil and Water Resources, 2011).

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 Monitoring Section of the TMDL states that monitoring will occur to both track the progress of implementation and to get a better understanding of the lake dynamics. To better understand linkages of load sources to lake responses, and reduce uncertainties in model predictions, the monitoring should include: more samples per season in the epilimnion of the lake; more temperature/DO profiles in the lake; more samples in the hypolimnion, including iron and sulfate; bioassays; and the addition of chlorophyll monitoring. If excessive algal blooms occur, there will be blue-green algae toxicity testing. Sampling will occur at the lake and the inlet.

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 Implementation Activities Section of the TMDL states that planning activities have already begun and there will be a detailed implementation plan developed after the completion of the TMDL. Control measures will include limiting nutrient transport from upland areas, stabilization of riparian zones, and in-channel improvements to reduce scour. The BMP guidance will use principles of the agro-ecoregion (characteristics of soil type, landscape features, climatic, land use) to determine the best management practices for nutrient management, vegetative, tillage, and structural practice.

The best practices for this Central Till agro-ecoregion are the vegetative practices that include contour farming , strip cropping, grassed waterways, grass filter strip for feedlot runoff, forest management practices, alternative crop in rotation, field windbreak, pasture management, and BMPs included within the Conservation Reserve Program (CRP) and the Conservation Reserve Enhancement Program (CREP). Tillage practices include leaving residue that can reduce erosion by up to two-thirds. Practices include using a chisel plow, one pass tillage, ridge till, and those that sustain surface roughness. Structural practices include wetland restoration, livestock exclusion (from streams), and liquid manure waste facilities. These practices include detailed site-specific planning. Wetlands provide a natural method of slowing and storing overland runoff. Stream and channel restoration can improve channel stability and decrease instream sources of sediment. Floodplains can provide water storage and reduce scouring of the channel banks.

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:
The TMDL was public noticed from May 27, 2013, to June 26, 2013. Copies of the draft TMDL were made available upon request and on the Internet web site: http://www.pca.state.mn.us/index.php/view-document.html?gid=19435 MPCA received a public comment letter during the public comment period. MPCA adequately addressed the comments within the letter, as well as EPA comments before the public draft.

EPA finds that the TMDL document submitted by MPCA satisfies all requirements concerning 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 waterbody, and the pollutant(s) of concern.

Comment:
The EPA received the final Sauk Lake - North Bay TMDL on October 17, 2013 accompanied by a submittal letter dated September 26, 2013. In the submittal letter, MPCA states that the submission includes the final TMDL for excess nutrients. The lake is impaired for a healthy community of cool or warm water sport or commercial fish, aquatic life, and their habitat, and for recreational use and bathing by excess phosphorus.

EPA finds that the TMDL document submitted by MPCA satisfies all requirements concerning this twelfth element.

## 13. Conclusion

**After a full and complete review, EPA finds that the phosphorus TMDL for Sauk – North Bay TMDL satisfies all of the elements of an approvable TMDL. This approval addresses one waterbody for phosphorus contributing to excess nutrient impairment.**

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.