



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

JUN 07 2010

REPLY TO THE ATTENTION OF:

WW-16J

Paul Eger, Commissioner  
Minnesota Pollution Control Agency  
520 Lafayette Road North  
St. Paul, Minnesota 55155-4194

Dear Mr. Eger:

The U. S. Environmental Protection Agency has conducted a complete review, including supporting documentation and follow-up information, of the final Total Maximum Daily Loads (TMDLs) for the Comfort Lake-Forest Lake "Six Lakes" watershed. The TMDLs address Aquatic Recreation Use impairments due to excess phosphorus in Comfort Lake, Bone Lake, Moody Lake, School Lake, Shields Lake, and Little Comfort Lake. The lakes are located within Chisago and Washington Counties.

The TMDLs meet 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 six TMDLs for total phosphorus for the six lakes. 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 these TMDLs 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 black ink, appearing to read "Tinka G. Hyde".

Tinka G. Hyde  
Director, Water Division

Enclosure

cc: Christopher Klucas, MPCA  
Dave Johnson, MPCA

**TMDL:** Comfort Lake-Forest Lake/Six Lakes TMDL  
**Effective Date:**

## **Decision Document for Approval of Comfort Lake-Forest Lake Watershed TMDL Report**

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 non-point 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 non-point 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.

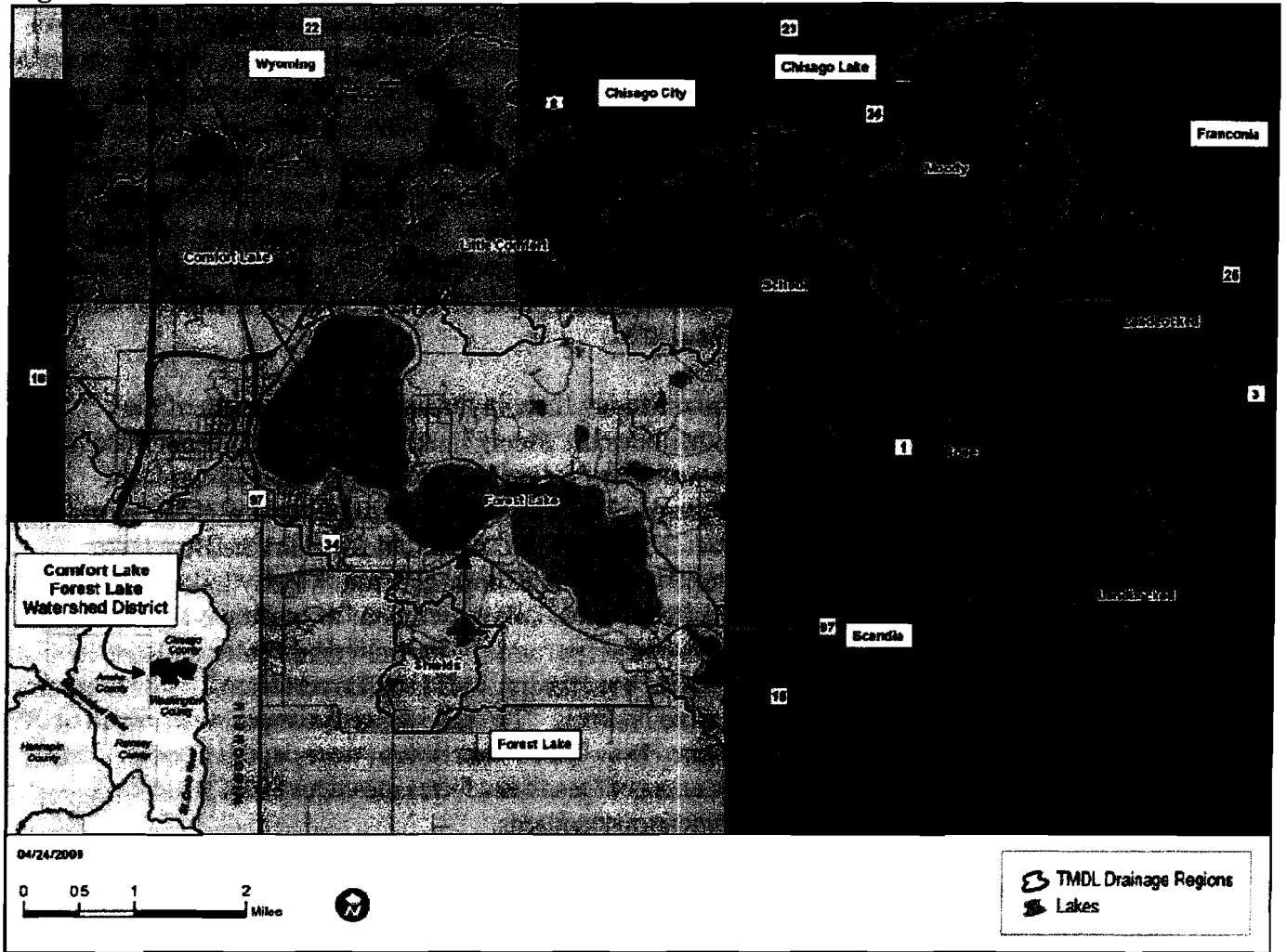
*Comment:*

*Summary:* The Minnesota Pollution Control Agency (MPCA) submitted TMDLs to EPA for the following waterbodies: Moody Lake, Bone Lake, School Lake, Little Comfort Lake, Shields Lake and Comfort Lake. With the exception of Little Comfort Lake, all lakes are listed on the Minnesota 303(d) list for eutrophication (Total Phosphorus) impairing aquatic recreation. Recent water quality monitoring data for Little Comfort Lake indicates that the lake is impaired for nutrients thereby requiring the development of a TMDL. Development of the TMDLs for all lakes began in 2008 with final TMDLs submitted in 2010. The “Six Lakes” TMDLs will not only address impairments in the watershed, but also reduce phosphorus loadings to the Sunrise River and ultimately to the Lake St. Croix Basin. MPCA believes the TMDLs will reduce the amount of total phosphorus coming out of Comfort Lake, the lake to which all of the lakes drain, from 1418 lb/yr to 1262 lb/yr or, an 11% reduction. EPA is approving the phosphorus TMDLs for Moody Lake, Bone Lake, School Lake, Little Comfort Lake, Shields Lake and Comfort Lake in the Comfort Lake-Forest Lake watershed.

*Location Description:* The Six Lakes TMDL is a watershed based TMDL which addresses six impaired lakes, all within the St. Croix River Basin (Figure 1 below). This chain of lakes is located within Chisago and Washington Counties. The TMDLs address aquatic recreation impairments due to total phosphorus. The TMDLs were developed by the Comfort Lake – Forest Lake Watershed District (CLFLWD) along with MPCA.

Section 1B of the TMDL report states that these lakes are located in the Comfort Lake-Forest Lake (CLFL) subwatershed and are identified by hydrologic code 07030005. This watershed lies entirely within the North Central Hardwood Forest Ecoregion. The drainage through this system of lakes flows from Moody Lake to Bone Lake to School Lake to Little Comfort Lake to Comfort Lake (Figure 1 below). Shields Lake flows into the un-impaired (for eutrophication) Forest Lake which flows to Comfort Lake. Thus, the Comfort Lake watershed includes the watershed of each of the other lakes as well as drainage flow from the City of Forest Lake and the City of Wyoming. Figure 1 below displays arrows indicating the general drainage direction of the major lakes and displays the drainage region boundaries encompassing the land areas that drain to the major lakes. Forest Lake is impaired for mercury (Hg) and a state-wide TMDL has been completed to address that impairment. Forest Lake is also listed as impaired for PCBs, although no TMDL is being developed for PCBs at this time.

Figure 1.



The Moody Lake subwatershed is located in the northeast portion of the CLFL watershed. Moody Lake is located in Chisago Lake Township and the subwatershed is located within two municipalities (Chisago Lake Township and City of Scandia). Moody Lake is 34 acres in surface area, with a 2,315-acre watershed and a 68:1 ratio of watershed to lake surface area. The two main tributaries to Moody Lake enter the lake from the north. One tributary is an outlet from Lendt Lake and the watershed to the north and the other tributary drains the watershed to the northwest. Moody Lake has about 12 parcels along its lakeshore and no public boat access. It is currently used for recreation and for watering of livestock. The maximum water depth is 48 ft and the mean water depth is 14 ft. Moody Lake is subject to MPCA's general eutrophication standards since its maximum water depth is greater than 15 ft and the littoral zone for water depth areas of less than 15 ft is less than 80%.

Bone Lake is located just downstream of Moody Lake in the east central portion of the CLFL watershed. The subwatershed includes the Moody Lake subwatershed. Bone Lake is located in the City of Scandia, and its watershed is located in Scandia and Chisago Lake Township. Bone Lake has a surface area of 204 acres and a watershed area of 5,586 acres for a ratio of watershed to lake area of about 27:1. There are seven lakes within the Bone Lake watershed. The main tributaries to Bone Lake include drainage from Moody Lake entering at the northwest side of Bone Lake, drainage from Third Lake entering at the northeast side of Bone Lake, and drainage from the east and southeast portions of the watershed entering Bone Lake at the southeast side. Bone Lake has a public boat landing and is used recreationally for swimming, fishing, and motorized and non-motorized boating. The lake has a maximum water depth of 30 ft and a mean water depth of 13 ft. Since Bone Lake's maximum water depth is greater than 15 ft and the littoral zone for water depth areas of less than 15 ft is less than 80%, Bone Lake is subjected to MPCA's general eutrophication standards.

School Lake is located downstream of Bone Lake and Birch Lake in the north central portion of the CLFL watershed. The School Lake subwatershed includes the Bone Lake and Moody Lake watersheds. School Lake is located in Wyoming Township, and its subwatershed is located in Wyoming Township, Chisago Lake Township and the City of Scandia. School Lake has a surface area of 49 acres and a total watershed area of 8,272 acres for a ratio of watershed to lake area of about 169:1. There are 10 lakes within the School Lake watershed. The main tributaries to School Lake include drainage from Birch Lake and the local northern portion of the watershed entering at the east side of School Lake. School Lake has about 10 lakeshore owners and no public boat access. The maximum water depth is 26 ft and the mean water depth is 11 ft. Since School Lake's maximum water depth is greater than 15 ft and the littoral zone for water depth areas of less than 15 ft is less than 80%, School Lake is subjected to MPCA's general eutrophication standards.

Little Comfort Lake is located downstream of School Lake in the north central portion of the CLFL watershed. The Little Comfort Lake subwatershed includes the School Lake, Bone Lake and Moody Lake subwatersheds. Little Comfort Lake is located in Chisago City and Wyoming Township, and its watershed is located in Chisago City, Wyoming Township, the City of Scandia and Chisago Lake Township. Little Comfort Lake has a surface area of 35 acres and a total watershed area of 10,009 acres for a ratio of watershed to lake area of about 286:1. There are eleven lakes within the Little Comfort Lake watershed. The only tributary to Little Comfort Lake

is drainage from School Lake entering at the east end of the lake. Little Comfort Lake has about 22 lakeshore parcels and no public boat launch. It is used for fishing, swimming, boating, and other recreational activities. The lake has a maximum water depth of 54 ft and a mean water depth of 18 ft. Since Little Comfort Lake's maximum water depth is greater than 15 ft and the littoral zone for water depth areas of less than 15 ft is less than 80%, Little Comfort Lake is subjected to MPCA's general eutrophication standards.

Shields Lake is located in the south central portion of the CLFL watershed. The Shields Lake subwatershed is within the City of Forest Lake in Washington County (Figure 1, Table 2 below). Shields Lake is a shallow lake with a surface area of 27 acres and a total watershed area of 538 acres for a ratio of watershed to lake area of about 20:1. The main tributary to Shields Lake flows from the southern portion of its subwatershed entering the lake at the south side. Shields Lake drains to Forest Lake. Shields Lake has been the focus of a number of past lake improvement efforts including aeration, fish stocking, fish barrier installation, and alum treatment. The lake's current management includes an aeration system and a fish barrier on the outflow stream to Forest Lake. In 2007, trumpeter swans were noted to be nesting on the lake. Shields Lake has a fishing pier but no public boat launch. The lake has a maximum water depth of 26 ft and a mean water depth of 7.4 ft. Since Shields Lake's maximum water depth is greater than 15 ft and the littoral zone for water depth areas of less than 15 ft is greater than 80%, Shields Lake is subjected to MPCA's general eutrophication standards for shallow lakes.

Comfort Lake is located downstream of Little Comfort Lake and Forest Lake in the northwest portion of the CLFL watershed, and is the outlet to the entire Comfort Lake-Forest Lake watershed. Therefore, its watershed includes all other lakes in the District. Comfort Lake is located in the City of Wyoming. Comfort Lake has a surface area of 218 acres and a total watershed area of 24,832 acres for a ratio of watershed to lake area of about 111:1. The main tributaries to Comfort Lake include drainage from Little Comfort Lake entering at the southeast end of the lake and drainage from Forest Lake and the former Judicial Ditch 1 entering at the west side of the lake through Shallow Pond, a large wetland. Comfort Lake has a public boat landing and is used recreationally for swimming, fishing, and motorized and non-motorized boating. The lake has a maximum water depth of 47 ft and a mean water depth of 19 ft. Since Comfort Lake's maximum water depth is greater than 15 ft and the littoral zone for water depth areas of less than 15 ft is less than 80%, Comfort Lake is subjected to MPCA's general eutrophication standards.

*Topography and Land Use:* Section 1B of the TMDL report states that the land uses in the Comfort Lake-Forest Lake watershed are cropland (21%), forest (14%), golf course, grassland (12%), sand and gravel, high-, low-, medium-density development (18% for medium-density development), wetlands (24%), and other. Table 1 (below) shows the lake watershed land use for each lake.

**Table 1. Lake Watershed Land Use Summary**

<b>Cropland</b>	33%	39%	30%	27%	20%	21%
<b>Forest</b>	15%	13%	18%	18%	13%	14%
<b>Golf Course</b>	0%	0%	0%	0%	17%	1%
<b>Grassland</b>	18%	16%	17%	18%	15%	12%
<b>Sand &amp; Gravel</b>	0%	0%	0%	0%	0%	0%
<b>Developed-High Density</b>	0%	0%	0%	0%	0%	3%
<b>Developed-Medium Density</b>	4%	7%	5%	6%	14%	18%
<b>Developed-Low Density</b>	3%	2%	3%	3%	2%	2%
<b>Wetlands</b>	26%	20%	25%	25%	15%	24%
<b>Other</b>	0%	3%	3%	3%	2%	4%

*Pollutant of concern:* The pollutant of concern for all lakes is total phosphorus which affects aquatic recreation such as fishing and swimming. Levels of phosphorus are above water quality standards. To be listed as impaired in Minnesota, the monitoring data must show that the standards for both total phosphorus (causal factor) and either chlorophyll-A or Secchi depth (response factor) were violated. Section 3 of the TMDL report discusses the water quality data for each lake and its link to the water quality standards.

*Sources:* Section 4 of the TMDL report states that the nonpoint sources and point sources within the CLFL watershed are:

1) *Pollutant point sources:*

- Current Municipal Separate Storm Sewer System (MS4): City of Forest Lake (MS400262)
- Future MS4s due to future growth: City of Chisago City, City of Wyoming, City of Scandia
- Construction activities at Washington and Chisago counties

No Concentrated Animal Feeding Operation (CAFO) permitted facilities exist within the CLFL watershed.

2) *Pollutant nonpoint sources:*

- Watershed runoff based on land use
- Upstream lakes

- Internal total phosphorus loading
- Individual failing septic systems
- Atmospheric deposition
- Groundwater
- Livestock
- Unregulated MS4s (defined as the land within the areal boundary of an MS4 permit but does not drain to the regulated MS4 collection system)

Sources identified by MPCA in the TMDL report as contributing to the nutrient impairments include watershed runoff based on land use, upstream lakes, internal total phosphorus loading, individual failing septic systems, atmospheric deposition, groundwater, livestock, and unregulated MS4s. MPCA determined that much of the phosphorus load in each lake is a result of internal phosphorus loading, upstream lakes, and unregulated MS4s (Section 4 of the TMDL report). The phosphorus loadings from unregulated MS4s increase as the lakes drain towards Comfort Lake. Internal phosphorus loadings are the main sources for Moody and Bone Lakes (upstream lakes). Phosphorus loading from livestock to Moody Lake and from an upstream lake (Moody) to Bone Lake are main sources as well. Heading towards the downstream end, School Lake's main sources are unregulated MS4s, upstream lakes, and livestock, and Little Comfort Lake's main sources are internal phosphorus loadings and an upstream lake (School Lake). Comfort Lake's main sources are upstream lakes and internal loading. Details on phosphorus loads from nonpoint sources are described in Sections 4 and 6 in the TMDL report.

*Population and growth trends:*

By 2020, MPCA anticipates the City of Chisago, City of Wyoming, Wyoming Township, and City of Scandia will reach a population of 5,000; therefore, they will be required to have Phase II MS4 permits by MPCA (Section 6C of the TMDL report). By 2030, Chisago Lakes Township will reach a population of 5,000 and will require a Phase II MS4 permit. Refer to Section 1B (Population), Table 5, in the TMDL report for more detail.

Load Allocations (LAs) are assigned to non-urban land uses for both current and future unregulated MS4 loads. Wasteload Allocations (WLAs) are assigned to urban land uses for both current and future regulated MS4 loads.

Priority Ranking: Minnesota does not include separate priority rankings for its waters in the TMDL. MPCA prioritizes its waters during the development of the impaired waters list. Development of the TMDL for all lakes began in 2008 with final TMDLs submitted in 2010.

*EPA finds that the TMDL document submitted by MPCA satisfies all requirements of 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 of Waterbody: All of the lakes included in the TMDL report submittal are classified under Minnesota Rule 7050.0430 as Class 2B, 3B, 4A, 4B, 5, and 6 waters. The most protective of these classes is Class 2 waters, which are protected for aquatic life and recreation. MN Rules Chapter 7050.0140 Water Use Classification for Waters of the State reads:

Subp. 3. Class 2 waters, aquatic life and recreation. Aquatic life and recreation includes all waters of the state which do or may support fish, other aquatic life, bathing, boating, or other recreational purposes, and where quality control is or may be necessary to protect aquatic or terrestrial life or their habitats, or the public health, safety, or welfare.

Water Quality Standard:

All lakes in the TMDL report are subjected to MN Eutrophication Standards, North Central Hardwood Forests Ecoregion (Table 6 in the TMDL report and Table 2 below). Numerical standards are given in MN’s Rule 7050.0222 with narrative standards in MN’s Rule 7050.0222 subpart 4a. Moody, Bone, School, Comfort and Little Comfort Lakes are subject to the general eutrophication standard. Shields Lake is subject to the eutrophication standard for shallow lakes.

**Table 2.** MN Eutrophication Standards, North Central Hardwood Forests Ecoregion

TP (ug/L)	TP < 40	TP < 60
Chlorophyll-A (ug/L)	Chl-A	Chl-A < 20
Secchi depth (m)	SD > 1.4	SD > 1.0

*Targets:* To achieve the designated use and the applicable eutrophication criteria, MPCA selected the total phosphorus criterion (40 µg/L or 60 µg/L) as the primary target of the TMDLs (Section 2.0 of the TMDL).

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

### **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:*

*Loading Capacity:* To estimate the assimilative capacity of the lake, the Comfort Lake Forest Lake Watershed District (CLFLWD) Watershed Loading and Lake Response Model (WLLRM) was developed to model the phosphorus loadings and lake water quality response (CLFLWD Watershed and Lake Water Quality Modeling Investigation, 2007 and Section 5 of the TMDL report). The CLFLWD Watershed and Lake Water Quality Modeling Investigation document can be found at <http://www.clflwd.org/documents/CLFLWDRReport-January2008.pdf> and its appendices are located at <http://www.clflwd.org/resources.php>

The CLFLWD WLLRM was developed to model the phosphorus loadings and lake water quality response. The components of the CLFLWD WLLRM are the water budget, internal and external phosphorus loadings, and the lake's response to internal and external phosphorus loadings. The water budget was developed using water quality and hydrologic data. Data gaps (i.e.,

unmonitored sites and unmonitored timeframes) in the water budget were addressed by using data outputs from the XP-SWMM model that used water quality data as data inputs. The phosphorus loads in the CLFL watershed were determined using unit area loading rates (UALs). The phosphorus loads calculated by UALs were used as inputs to the lake loading model by lakeshed. The lake loading model assessed the lake's response to internal and external phosphorus loadings (CLFLWD Watershed and Lake Water Quality Modeling Investigation, 2007). The lake loading model was based on the Canfield-Bachmann natural lakes phosphorus sedimentation model. The outputs of the lake loading model provided the baseline loadings for the watershed.

Load Allocations (LAs) are assigned to non-urban land uses for both current and future unregulated MS4 loads. Wasteload Allocations (WLAs) are assigned to urban land uses for both current and future regulated MS4 loads. For example, City of Forest Lake is a current, regulated MS4. A WLA has been calculated for the City of Forest Lake since it is a current, regulated MS4. A LA has been calculated for the City of Forest Lake based on future land use that includes non-urban land uses within its projected MS4 boundary expansion. The projected MS4 boundary expansion is based on 2020 and 2030 Census population data. Although MPCA's current policy on stormwater (stormwater rule is under Minnesota Statute 7090.1010) states that current and future MS4s are assigned WLAs regardless of land use, at the time this TMDL report was written, MPCA's policy on stormwater as it relates to LAs and WLAs was in the process of changing. MPCA decided that the LAs and WLAs presented in the TMDL report would be grandfathered under MPCA's old stormwater policy. Therefore, WLAs and LAs were calculated for current and future MS4s in this TMDL report.

The loading capacity developed to meet the phosphorus criterion of 40µg/l for Moody, Bone, School, Little Comfort, and Comfort Lakes and the shallow lake phosphorus criterion of 60 ug/l for Shields Lake are presented in Table 3 and in Table 25 in the TMDL report. The loading capacity is the combination of the wasteload allocation, load allocation, and margin of safety. Thus, the loading capacity is equal to the TMDL assigned for the waterbody.

**Table 3.** Existing Loads and TMDLs

<b>Moody</b>	Existing	1,023	--
	Standard (40 ug/L TP)	144	<b>0.395</b>
<b>Bone</b>	Existing	1,229	--
	Standard (40 ug/L TP)	669	<b>1.833</b>
<b>School</b>	Existing	928	--
	Standard (40 ug/L TP)	452	<b>1.238</b>
<b>Little Comfort</b>	Existing	1,255	--
	Standard (40 ug/L TP)	577	<b>1.58</b>
<b>Shields</b>	Existing	1,107	--
	Standard (60 ug/L TP)	195	<b>0.534</b>
<b>Comfort</b>	Existing	2,465	--
	Standard (40 ug/L TP)	2,339	<b>6.41</b>

*Critical conditions:* Section 5C of the TMDL report states:

“Critical conditions in the lakes occur in the summer when TP concentrations peak and clarity is at its worst, often in July and August. Since the standards are based on June through September water quality averages, the standard itself addresses the lake condition during critical conditions. The load reductions are designed so that the lakes will meet the water quality standards over the course of the growing season (June through September).”

Further detail on Load Capacity can be found in Section 5 of the TMDL report .

*EPA finds that the TMDL document submitted by MPCA satisfies all requirements of 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 non-point 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 non-point sources.

*Comment:* Section 6C of the TMDL report states that the LA includes loads from stormwater runoff in non-MS4 areas (Chisago Lake Township) and livestock, unregulated portions of MS4s within an MS4 area, and non-urban land use areas located in future regulated MS4 loads (City of Forest Lake, City of Wyoming, City of Chisago City, City of Scandia), internal loading, upstream lakes, groundwater, individual septic systems, and atmospheric deposition. Although the load designated for each of these sources was estimated separately, they are jointly included as one overall LA. Table 43 of the TMDL report and Table 4 below presents the load allocation for each lake. The TMDL report does not include a total load reduction percentage breakdown by lake.

**Table 4.** Total Phosphorus Load Allocation for each lake

Total Phosphorus Load Allocation for each lake			
Moody Lake: (40 ug/L)	0.392	Unregulated MS4 portions of City of Scandia, Chisago Lake Township, Internal, Atmospheric, Groundwater	0.392
Bone Lake: (40 ug/L)	1.819	Unregulated MS4 portions of City of Scandia, Chisago Lake Township, Internal, Atmospheric, Groundwater, Moody Lake outflow	1.819
School Lake: (40 ug/L)	1.226	Unregulated MS4 portions of City of Scandia, Chisago City, City of Forest Lake, and Chisago Lake Township, Internal, Atmospheric, Groundwater, Bone Lake outflow	1.226
Little Comfort Lake: (40 ug/L)	1.26	Unregulated MS4 portions of City of Forest Lake, City of Chisago City, City of Wyoming, Internal, Atmospheric, Groundwater, School Lake outflow	1.26
Shields Lake: (60 ug/L)	0.481	Unregulated MS4 portions of City of Forest Lake, Internal, Atmospheric, Groundwater: no permit	0.481
Comfort Lake: (40 ug/L)	3.41	Unregulated MS4 portions of City of Forest Lake, City of Chisago City, City of Scandia and City of Wyoming, Internal, Atmospheric, Groundwater, Little Comfort Lake outflow: no permit	3.41

Section 6C to 6J in the TMDL report provides further detail on load allocation calculation by source for each lake.

*EPA finds that the TMDL document submitted by MPCA satisfies all requirements of 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 WQs 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.

*Comments:*

The only point sources identified by MPCA within the watersheds are permitted construction sites and MS4s as discussed in Section 6B of the TMDL. MPCA determined a WLA for industrial facilities discharging stormwater; however, no industrial facilities currently discharge permitted stormwater. The WLA for the industrial dischargers will apply to any future discharger (Section 6B of the TMDL report). The WLAs for construction activities are based on four years of data on total land use area under permitted construction activity in Chisago and Washington counties. The State assumed that industrial stormwater would not exceed construction activity discharges, and therefore assigned a WLA equal to the construction activities. The WLAs for construction and industrial stormwaters are each set to 0.38% per year based on total land use area. Urban land use areas located in current and future MS4s are defined as WLAs. Minnesota Department of Transportation (MN DOT) and county roads in the CLFL watershed are not under permit coverage; therefore, no WLA is assigned. Additional details on setting WLAs is provided in Sections 6B to 6J in the TMDL report. Table 43 of the TMDL report and Table 5 below presents the waste load allocation for each lake. The TMDL report does not include a total load reduction percentage breakdown by lake.

**Table 5. Total Phosphorus Wasteload Allocation for each lake**

Moody Lake: (40 ug/L)	0.003	Construction (various permits)	0.0015
		Industrial Stormwater (future permits)	0.0015
Bone Lake: (40 ug/L)	0.014	Construction (various permits)	0.007
		Industrial Stormwater (future permits)	0.007
School Lake: (40 ug/L)	0.012	Construction (various permits)	0.0045
		Industrial Stormwater (future permits)	0.0045
		City of Chisago City MS4: future permit	0.003
		The Preserve at Birch Lake: MN0050474	0.000
Little Comfort Lake: (40 ug/L)	0.32	Construction (various permits)	0.005
		Industrial Stormwater (future permits)	0.005
		City of Forest Lake MS4: MS400262	0.01
		City of Chisago City MS4: future permit	0.15
		City of Wyoming MS4: future permit	0.15
		Liberty Ponds: MN0067466	0.00
Shields Lake: (60 ug/L)	0.053	Construction (various permits)	0.002
		Industrial Stormwater (future permits)	0.002
		City of Forest Lake MS4: MS400262	0.049
Comfort Lake: (40 ug/L)	3.00	Construction (various permits)	0.02
		Industrial Stormwater (future permits)	0.02
		City of Forest Lake MS4: MS400262	1.35
		City of Wyoming MS4: future permit	1.55
		City of Chisago City MS4: future permit	0.06

*EPA finds that the TMDL document submitted by MPCA satisfies all requirements of 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:*

MPCA used an implicit MOS for the TMDLs for the six lakes. Conservative modeling assumptions included applying sedimentation rates from the Canfield-Bachmann model that likely under-predict the sedimentation rate for shallow lakes. Zooplankton grazing plays a large role in algal and subsequent phosphorus sedimentation in shallow lakes. However, the Canfield-Bachmann equation does not account for the expected higher sedimentation rates (and thus phosphorus lost to the water column) expected in healthy shallow lake systems.

Additionally, empirical relationships used to predict chlorophyll-a and Secchi transparency are more established for deep lakes and do not account for zooplankton grazing critical to maintaining a clear water state in shallow lakes. Consequently, the models likely under-predict the clarity response of the lake to reduced phosphorus concentrations. As water quality improves zooplankton consumes higher amounts of algae, thereby removing it from the system. The model therefore overestimates the phosphorus concentration in the lake, and correspondingly overestimates the reductions needed to achieve the WQS.

*EPA finds that the TMDL document submitted by MPCA satisfies all requirements of 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:*

MPCA determined that total phosphorus concentrations are highest and clarity is at its worst during the summer months for all six lakes. The nutrient standards were set by MPCA to meet the most critical period (summer), therefore, the TMDLs will be protective of water quality during all other seasons in all lakes (Section 7 of the TMDL report).

*EPA finds that the TMDL document submitted by MPCA satisfies all requirements of 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 non-point sources, and the WLA is based on an assumption that non-point source load reductions will occur, EPA's 1991 TMDL Guidance states that the TMDL should provide reasonable assurances that non-point 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 non-point sources. However, EPA cannot disapprove a TMDL for non-point 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:*

Reasonable Assurance is discussed in detail in Section 10 of the TMDL report. Federal, State, watershed, local, and water utility authorities will tap into their programs to provide reasonable assurance for the TMDLs. Potential programs include: municipal ordinances and new CLFLWD Rules, CLFLWD Capital Improvement Plan, NPDES MS4 Program, Shared Education Program run by the East Metro Water Resource Education Program partnership, and Soil & Water Conservation District and Natural Resources Conservation Service programs. The Comfort-Lake Forest Lake Watershed District, the City of Forest Lake and the Washington Conservation District are members of the East Metro Water Resource Education Program. As discussed in Section 10 below, the draft Implementation Plan discusses activities, costs, and capital projects that will be implemented to reduce phosphorus loads in the six lakes.

*EPA finds that the TMDL document submitted by MPCA addresses this eighth element.*

## **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 non-point sources, and the WLA is based on an assumption that non-point source load reductions will occur. Such a TMDL should provide assurances that non-point 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:*

Monitoring is planned after implementation activities under the TMDL Implementation Plan are underway. Monitoring data will be collected to evaluate BMP effectiveness and will continue until the water quality standard is achieved. In addition to the usual suite of parameters collected

for water quality monitoring data, additional types of sampling data will be collected for Shields Lake, Little Comfort Lake, and deeper lakes for the purpose of evaluating if impairments such as degraded habitat and low DO have really been improved. Further details on types of sampling data collected are located in Section 8A of the TMDL report.

*EPA finds that the TMDL document submitted by MPCA satisfies all requirements of this ninth element.*

## **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 CLFL Watershed District has completed a TMDL Implementation Plan and has been tentatively approved by the MPCA on April 9, 2010. Final approval of the Implementation Plan by MPCA will occur once EPA finalizes the TMDL. The Implementation Plan can be found at [http://www.clflwd.org/documents/TMDL\\_Implementation\\_Planfinal.pdf](http://www.clflwd.org/documents/TMDL_Implementation_Planfinal.pdf). The MPCA policy is to require an Implementation Plan within one year of EPA approval of the TMDL. The MPCA reviews and approves the Implementation Plans.

Section 9 of the TMDL report and the TMDL Implementation Plan includes efforts to reduce internal and external total phosphorus loadings to each lake. Implementation of urban BMPs, agricultural BMPs, and lakeshore BMPs is planned for the six lakes in partnership with the local community and MPCA. Further detail on the type and extent of BMP activities for each lake is described in the TMDL Implementation Plan and is summarized briefly in Section 9 of the TMDL report.

*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:

Five public meetings took place throughout the TMDL development process, on the following dates: March 28, 2007; June 21, 2007; July 25, 2007; January 7, 2008; April 8, 2009. All meetings were held at the Comfort Lake Forest Lake Watershed District offices in Forest Lake, Minnesota.

The CLFLWD Six Lakes TMDL was posted on the MPCA's website for public comment and review for a 30-day public comment period. The review period took place from November 23, 2009 through December 23, 2009. The draft TMDL Study was posted at: <http://www.pca.state.mn.us/water/tmdl/tmdl-draft.html>, the MPCA's TMDL web site. During this time the MPCA received and responded to five comment letters from the public and local entities. Public comments were submitted with the TMDL report and addressed appropriately by MPCA.

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

Comment:

On March 31, 2010, EPA received the Comfort Lake Forest Lake TMDL, and a submittal letter dated March 24, 2010, signed by Paul Eger, Commissioner, addressed to Tinka Hyde, U.S. EPA, Region 5, Water Division. In the submittal letter, MPCA stated "I am pleased to submit the Comfort Lake -Forest Lake Total Maximum Daily Load (TMDL) study for excess nutrients to the U.S. Environmental Protection Agency (EPA) for final approval." The submittal letter included the names and locations of the waterbodies and the pollutants of concern.

The U.S. EPA is approving a TMDL for phosphorus in Little Comfort Lake, which is not on MPCA's 2008 Section 303(d) list. While developing the Comfort Lake-Forest Lake TMDL project, MPCA determined that Little Comfort Lake was impaired by phosphorus. The lake was clearly identified in the draft TMDL (dated November 2009). The public had the opportunity to

comment on the additional lake in the TMDL during the MPCA public comment period. The lake was included in the final TMDL submitted to EPA. The TMDL report discusses the impairments for all lakes in the watershed, and MPCA determined TMDL allocations and calculations for all lakes, as MPCA developed the TMDL on a watershed basis.

EPA believes it was reasonable for MPCA to develop a TMDL for the previously unlisted lake in the watershed at the same time it was developing TMDLs for the listed lakes. Because the public has had the opportunity to comment on the decision to include the additional waterbody within the TMDL, as well as the calculations used to establish the TMDL, EPA believes it is appropriate to approve the additional TMDL at this time.

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

### **13. Conclusion**

After a full and complete review, EPA finds that the total phosphorus TMDLs for Moody Lake, Bone Lake, School Lake, Little Comfort Lake, Shields Lake and Comfort Lake in the Comfort Lake-Forest Lake watershed satisfy all of the elements of an approvable TMDL. This decision document addresses 6 TMDLs for 5 waterbodies as identified on Minnesota's 303(d) list (Table 6) and 1 waterbody, Little Comfort Lake, that will be listed on Minnesota's 303(d) list in the future based on recent water quality monitoring data.

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.

**Table 6. Impaired Waters Listing\***

<b>DNR ID#</b>	13-0023-00	82-0054-00	13-0057-00	82-0162-00	13-0053-00	13-0054-00
<b>Hydrologic Unit Code</b>	07030005	07030005	07030005	07030005	07030005	07030005
<b>Pollutant or Stressor</b>	Nutrient/ Eutrophication Biological Indicators	Nutrient/ Eutrophication Biological Indicators	Nutrient/ Eutrophication Biological Indicators	Nutrient/ Eutrophication Biological Indicators	Nutrient/ Eutrophication Biological Indicators	Nutrient/ Eutrophication Biological Indicators
<b>Impairment</b>	Aquatic recreation	Aquatic recreation	Aquatic recreation	Aquatic recreation	Aquatic recreation	Aquatic recreation

\* Although Little Comfort Lake is not on the 303(d) list, recent water quality monitoring data indicates that the lake is impaired for nutrients and will be on the 303(d) list in the future.