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

REPLY TO THE ATTENTION OF:
WW-16J

SEP 0 2 2014

Rebecca J. Flood, Assistant Commissioner
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 Loads (TMDL) for the Jefferson-German Lake Chain and Lake Volney, including support documentation and follow up information. The Jefferson-German Lake Chain and Lake Volney is located in south central Minnesota in Le Sueur and Blue Earth Counties. The Jefferson-German Lake Chain and Lake Volney TMDLs address impaired aquatic recreation due to excessive nutrients (phosphorus).

EPA has determined that the Jefferson-German Lake Chain and Lake Volney TMDLs meet the requirements of Section 303(d) of the Clean Water Act and EPA's implementing regulations set forth at 40 C.F.R. Part 130. Therefore, EPA approves Minnesota's six nutrient TMDLs. 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 efforts 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,

Tinka G. Hyde
Director, Water Division

Enclosure
cc: Celine Lyman, MPCA
Shaina Keseley, MPCA

wq-iw9-11g

**TMDL:** Jefferson-German Lake Chain nutrient TMDLs, Le Sueur and Blue Earth Counties, Minnesota
**Date:** September 2, 2014

# DECISION DOCUMENT
# FOR THE JEFFERSON-GERMAN LAKE CHAIN NUTRIENT TMDLS, LE SUEUR & BLUE EARTH COUNTIES, MN

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:**
The Jefferson-German watershed is located in southeastern Le Sueur County and northeastern Blue Earth County in south-central Minnesota. The Jefferson-German chain of lakes consists of five lakes: West Jefferson Lake, Middle Jefferson Lake, Swedes Bay, East Jefferson Lake, and German Lake. This chain of five lakes is part of the Upper Cannon River watershed, which is part of the Lower Mississippi River Basin in Minnesota.

The Minnesota Pollution Control Agency (MPCA) placed the five lakes which make up the Jefferson-German Lake Chain on the State of Minnesota's 303(d) Impaired Waters List in 2008. Table 1 of this Decision Document identifies the segments covered by this TMDL as they appear on the 2012 Minnesota 303(d) list. The lakes are identified as not meeting the Class 2B designation of aquatic life and recreational use due to exceedance of the total phosphorus (TP) criteria. This Decision Document approves **five TMDLs** for Jefferson-German Lake Chain.

**Table 1.** 303(d) List Summary for Jefferson-German Lake Chain

| Waterbody Name | Listing Year | Pollutant | Designated Use |
|---|---|---|---|
| German Lake (40-0063-00) | 2008 | Total Phosphorus | Aquatic Life and Recreational Use |
| East Jefferson Lake (40-0092-01) | 2008 | Total Phosphorus | Aquatic Life and Recreational Use |
| West Jefferson Lake (40-0092-02) | 2008 | Total Phosphorus | Aquatic Life and Recreational Use |
| Swedes Bay (40-0092-03) | 2008 | Total Phosphorus | Aquatic Life and Recreational Use |
| Middle Jefferson Lake (40-0092-04) | 2008 | Total Phosphorus | Aquatic Life and Recreational Use |

***Location Description/Spatial Extent:***
Lakes: The Jefferson-German Chain (JGC) consists of five interconnected lake basins that comprise a total surface area of 3,157 acres, making it the largest lake system in south-central Minnesota. The JGC ultimately discharges to the Mississippi River. Despite the relatively large size of the JGC, the watershed that drains into the JGC is relatively small (15,167 acres) and is dominated by agricultural land use. The watershed to lake surface area ratio of the JGC is 5:1. MPCA communicated that the combination of a small watershed to lake ratio gives this watershed a better than average chance for restoration. The Jefferson-German Chain flows in an easterly direction from West Jefferson Lake through Middle and East Jefferson and German Lake, with Swede's Bay flowing into East Jefferson Lake along the way.

The JGC is a relatively shallow lake ecosystem with 81% of the Jefferson Lake basins (comprised of West Jefferson, Middle Jefferson, East Jefferson, and Swedes Bay) and 58% of German Lake falling within the littoral zone. Due to a large wind fetch and shallow morphometry, the JGC is susceptible to internal nutrient loading via sediment re-suspension. Furthermore, an aquatic plant survey conducted in 2009 identified curly-leaf pondweed as being extremely abundant throughout the littoral zone of the JGC.

The physical details of the five lakes addressed in this TMDL are discussed in Table 2 of this Decision Document. MPCA bases its determination of whether a lake is classified as a deep lake (having a maximum depth of greater than 15 feet or less than 80% littoral) versus a shallow lake (having a

**Table 2.** Lake Characteristics[1]

| Parameter | West Jefferson Lake | Middle Jefferson Lake | Swedes Bay | East Jefferson Lake | German Lake |
|---|---|---|---|---|---|
| Surface Area (ac) | 439 | 664 | 492 | 646 | 885 |
| Maximum Depth (ft) | 24 | 8 | 6 | 37 | 51 |
| Watershed (ac) [includes lake surface area] | 1036 | 1765 | 5946 | 1684 | 4740 |
| Littoral Area (%) | 80 | 100 | 100 | 53 | 58 |

***Population and Future Growth:***
MPCA does not anticipate that there will be significant development in the Jefferson-German Lake watershed (Section 7.4 of the final TMDL document). MPCA explained that the Jefferson-German Lake watershed is not expected to be an area of future development for business or industry. MPCA did not account for future growth in the Jefferson-German Lake Chain TMDLs since no municipal separate storm sewer systems (MS4s) exist in the watershed. Generally, MPCA includes 5% of the MS4 loading to account for future growth in their TMDLs. Since MPCA did not calculate a load for MS4s, future growth was not included as a part of the loading capacity for the TMDLs.

***Priority Ranking:***
The waterbodies addressed by the Jefferson-German Lake Chain TMDLs were given a priority ranking for TMDL development due to: the impairment impacts on public health and aquatic life, the public value of the impaired water resource, the likelihood of completing the TMDL in an expedient manner, the inclusion of a strong base of existing data and the restorability of the waterbody, the technical capability and the willingness of local partners to assist with the TMDL, and the appropriate sequencing of TMDLs within a watershed or basin. Areas within the JGC are popular locations for aquatic recreation. Water quality degradation has led to efforts to improve the overall water quality within the watershed, and to the development of TMDLs for these waterbodies.

***Land Use:***
Table 3 of this Decision Document summarizes land use within the JGC watershed. The dominant land use for Jefferson-German Lake Chain watershed is cultivated land use (i.e., agricultural land uses). Areas designated as forests and wetlands are some of the lower land uses, based on percent of land area.

Section 1.6 of the TMDL provides further detailed information.

[1] Section 1.6, pp. 22-24, of the TMDL report.

**Table 3.** Land Use Characteristics for Jefferson-German Lake Chain[2]

| Land use | Percent of Land Area |
|---|---|
| West Jefferson Lake | |
| Cultivated | 40 |
| Developed | 25 |
| Pasture/Hay | 21 |
| Forest | 5 |
| Wetland | 7 |
| Grassland/Shrub | 2 |
| Middle Jefferson Lake | |
| Cultivated | 61 |
| Developed | 15 |
| Pasture/Hay | 13 |
| Forest | 6 |
| Wetland | 3 |
| Grassland/Shrub | 1 |
| Swedes Bay | |
| Cultivated | 47 |
| Developed | 7 |
| Pasture/Hay | 27 |
| Forest | 10 |
| Wetland | 5 |
| Grassland/Shrub | 3 |

| Land use | Percent of Land Area |
|---|---|
| East Jefferson Lake | |
| Cultivated | 21 |
| Developed | 15 |
| Pasture/Hay | 41 |
| Forest | 12 |
| Wetland | 9 |
| Grassland/Shrub | 2 |
| German Lake | |
| Cultivated | 41 |
| Developed | 9 |
| Pasture/Hay | 41 |
| Forest | 13 |
| Wetland | 7 |
| Grassland/Shrub | 4 |

***Problem Identification/Pollutant of Concern:***
The pollutant of concern for these five lake TMDLs is total phosphorus. Levels of phosphorus are above water quality targets, limiting all types of aquatic recreation, including fishing and swimming. Excess phosphorus stimulates excessive plant growth (algae and nuisance plants/weeds). This enhanced plant growth reduces dissolved oxygen in the water when dead plant material decomposes and can cause other organisms to die. These five lake TMDLs also include water quality data and information for the nutrient indicators, chlorophyll-a (chl-a) and Secchi depth (SD). Chlorophyll-a is a primary pigment in aquatic algae. Measured chl-a concentrations typically correlate with algal production. Secchi depth is an indicator for water clarity and quality and is measured by lowering a Secchi disk into the water until it can no longer be seen from the surface (Section 3.3 of the TMDL).

Total Phosphorus Data Results:
MPCA defined June to September 2009-2010 data as current conditions for Jefferson-German Lake Chain for the TMDL assessment.

**West Jefferson Lake:** On average, total phosphorus concentration in West Jefferson Lake was 64 μg/l from June to September of 2009 and 2010. TP water quality samples were taken from June to September of 2009 and 2010. Sixteen of the total eighteen samples exceeded MPCA's deep lake eutrophication standard. The TP concentrations demonstrate that West Jefferson Lake consistently exceeds MPCA's deep lake eutrophication standard of 40 μg/L and indicate high inputs from the watershed or in-lake sources.

[2] Table 1.6a, pp. 24-25, of the TMDL report.

**Middle Jefferson Lake:** On average, total phosphorus concentration in Middle Jefferson Lake was 141 µg/l from June to September of 2009 and 2010. TP water quality samples were taken from June to September of 2009 and 2010. Seventeen of the total eighteen samples exceeded MPCA's shallow lake eutrophication standard. The TP concentrations demonstrate that Middle Jefferson Lake consistently exceeds MPCA's shallow lake eutrophication standard of 60 µg/L and indicate high inputs from the watershed or in-lake sources.

**Swedes Bay:** On average, total phosphorus concentration in Swedes Bay was 304 µg/l from June to September of 2009 and 2010. TP water quality samples were taken from June to September of 2009 and 2010. Eighteen of the total twenty-seven samples exceeded MPCA's shallow lake eutrophication standard. The TP concentrations demonstrate that Swedes Bay consistently exceeds MPCA's shallow lake eutrophication standard of 60 µg/L and indicate high inputs from the watershed or in-lake sources.

**East Jefferson Lake:** On average, total phosphorus concentration in East Jefferson Lake was 75 µg/l from June to September of 2009 and 2010. TP water quality samples were taken from June to September of 2009 and 2010. Sixteen of the total seventeen samples exceeded MPCA's deep lake eutrophication standard. The TP concentrations demonstrate that East Jefferson Lake consistently exceeds MPCA's deep lake eutrophication standard of 40 µg/L and indicate high inputs from the watershed or in-lake sources.

**German Lake:** On average, total phosphorus concentration in German Lake was 65 µg/l from June to September of 2009 and 2010. TP water quality samples were taken from June to September of 2009 and 2010. Eighteen of the total eighteen samples exceeded MPCA's deep lake eutrophication standard. The TP concentrations demonstrate that German Lake consistently exceeds MPCA's deep lake eutrophication standard of 40 µg/L and indicate high inputs from the watershed or in-lake sources.

For more information, see Section 3.3 of the TMDL Report.

Chlorophyll-a Data Results:
**West Jefferson Lake:** A total of eighteen chl-a samples were taken from June to September of 2009 and 2010. The summer average water column Chl-a concentrations for West Jefferson Lake was 36 µg/l based on data from the two summer field seasons. The summer Chl-a concentration demonstrates that West Jefferson Lake consistently exceeds MPCA's deep lake eutrophication standard of 14 µg/L and that the high Chl-a concentrations in the lakes are indicative of high levels of algal growth and nuisance algal blooms.

**Middle Jefferson Lake:** A total of sixteen chl-a samples were taken from June to September of 2009 and 2010. The summer average water column Chl-a concentrations for Middle Jefferson Lake was 71 µg/l based on data from the two summer field seasons. The summer Chl-a concentration demonstrates that Middle Jefferson Lake consistently exceeds MPCA's shallow lake eutrophication standard of 20 µg/L and that the high Chl-a concentrations in the lakes are indicative of high levels of algal growth and nuisance algal blooms.

**Swedes Bay:** A total of eighteen chl-a samples were taken from June to September of 2009 and 2010. The summer average water column Chl-a concentrations for Swedes Bay was 79 µg/l based on data from the two summer field seasons. The summer Chl-a concentration demonstrates that Swedes Bay consistently exceeds MPCA's shallow lake eutrophication standard of 20 µg/L and that the high Chl-a concentrations in the lakes are indicative of high levels of algal growth and nuisance algal blooms.

**East Jefferson Lake:** A total of seventeen chl-a samples were taken from June to September of 2009 and 2010. The summer average water column Chl-a concentrations for East Jefferson Lake was 36 µg/l based on data from the two summer field seasons. The summer Chl-a concentration demonstrates that East Jefferson Lake consistently exceeds MPCA's deep lake eutrophication standard of 14 µg/L and that the high Chl-a concentrations in the lakes are indicative of high levels of algal growth and nuisance algal blooms.

**German Lake:** A total of eighteen chl-a samples were taken from June to September of 2009 and 2010. The summer average water column Chl-a concentrations for German Lake was 43 µg/l based on data from the two summer field seasons. The summer Chl-a concentration demonstrates that German Lake consistently exceeds MPCA's deep lake eutrophication standard of 14 µg/L and that the high Chl-a concentrations in the lakes are indicative of high levels of algal growth and nuisance algal blooms.

For more information, see Section 3.3 of the TMDL Report.

Secchi Depth Data Results:
**West Jefferson Lake:** Secchi depth measurements were taken June to September of 2009 and 2010. The summer average Secchi depth measurement for West Jefferson Lake was 1.3 meters (m). Thirteen of the total eighteen samples did not meet MPCA's deep lake Secchi depth standard. The average summer Secchi depth measurement demonstrates that West Jefferson Lake did not meet MPCA's deep lake Secchi depth standard of > 1.4 m.

**Middle Jefferson Lake:** Secchi depth measurements were taken June to September of 2009 and 2010. The summer average Secchi depth measurement for Middle Jefferson Lake was 1.0 m. Eleven of the total seventeen samples did not meet MPCA's deep lake Secchi depth standard. The average summer Secchi depth measurement demonstrates that Middle Jefferson Lake did not meet MPCA's deep lake Secchi depth standard of ≥ 1.0 m.

**Swedes Bay:** Secchi depth measurements were taken June to September of 2009 and 2010. The summer average Secchi depth measurement for Swedes Bay was 0.79 m. Six of the total eighteen samples did not meet MPCA's deep lake Secchi depth standard. The average summer Secchi depth measurement demonstrates that Swedes Bay did not meet MPCA's deep lake Secchi depth standard of ≥ 1.0 m.

**East Jefferson Lake:** Secchi depth measurements were taken June to September of 2009 and 2010. The summer average Secchi depth measurement for East Jefferson Lake was 1.7 m. Two abnormally good Secchi depth measurements likely skewed the summer average results (Figures 3.3 D.5 and 3.3 D.6 of the final TMDL document). Nine of the total seventeen samples did not meet MPCA's deep lake Secchi depth standard.

**German Lake:** Secchi depth measurements were taken June to September of 2009 and 2010. The summer average Secchi depth measurement for German Lake was 1.2 m. Thirteen of the total eighteen samples did not meet MPCA's deep lake Secchi depth standard. The average summer Secchi depth measurement demonstrates that German Lake did not meet MPCA's deep lake Secchi depth standard of > 1.4 m.

For more information, see Section 3.3 of the TMDL Report.

Fish Population Data Results:
The lakes are identified for not meeting the Class 2B designation of aquatic life and recreational use due to exceedances in total phosphorus (TP) concentrations. The fish population data collected by Minnesota Department of Natural Resources (MDNR) for Jefferson-German Lake Chain does not support the Class 2B designation of aquatic life and recreational use. The MDNR performed fish surveys at all lakes except for Swedes Bay in 2008. The MDNR performed fish surveys in Swedes Bay in 2002. Carp and black bullheads have been collected at Jefferson-German Lake Chain. Swedes Bay and Middle Jefferson are prone to winterkills and support tolerant fish species. West Jefferson Lake, East Jefferson Lake, and German Lake support a greater diversity of game fish species. Data from the fish survey shows that improvement is still needed in fish trophic balance and demonstrates that the Class 2B designation of aquatic life and recreational use is not supported.

Common carp are abundant in Jefferson-German Lake Chain. Common carp, a non-native species, were observed during field monitoring, and are likely contributing to reduced water clarity and higher internal phosphorus loads. Carp causes increased nutrients in waterbodies by uprooting aquatic macrophytes during feeding and spawning. The uprooting causes resuspension of bottom sediment and nutrients resulting in increased nuisance algal blooms. Section 1.10 and Appendix A of the TMDL Report provides further details.

Aquatic Plants Data Results:
Jefferson-German Lake Chain is identified for not meeting the Class 2B designation of aquatic life and recreational use due to exceedances in total phosphorus (TP) concentrations. The vegetation survey data collected by MDNR does not support the Class 2B designation of aquatic life and recreational use. High abundance and density in aquatic plants limit recreation activities. Additionally, excess nutrients within the water column may lead to non-native, invasive aquatic plants in the Jefferson-German Lake Chain. The inclusion of invasive aquatic plants may ultimately lead to shifts in the fish community since high densities of one aquatic plant species favors one fish species over another.

Vegetation surveys were taken twice by MDNR in 2009. The first survey conducted from May 13, 2009 to June 1, 2009 showed that curly-leaf pondweed was abundant. The second survey conducted from August 11, 2009 to August 22, 2009 showed that Eurasian water milfoil and native species were abundant. The very limited macrophyte growth is likely a factor of the deep morphometry and composition of sediment found in Jefferson-German Lake Chain which may be prohibitive of macrophyte growth.

Curly-leaf pondweed, an invasive species, had been observed in Jefferson-German Lake Chain twice from MDNR's surveys in 2009. Curly-leaf pondweed increases TP concentrations resulting in eutrophication. MDNR's observations of curly-leaf pondweed in the first survey supports Jefferson-German Lake Chain being listed as impaired for not meeting the Class 2B designation of aquatic life and recreational use. Section 1.10 and Appendix B of the TMDL report provides further information on aquatic vegetation data.

***Source identification:***
Section 7.0 of the TMDL report provides details on phosphorus loads from point and nonpoint sources to the Jefferson-German Lake Chain watershed.

The potential point sources to the five lakes of the Jefferson-German Lake Chain are:

Jefferson-German Lake Chain and its surrounding watershed are not considered a part of a MS4 community and therefore have no WLA attributed to MS4 contributions. There are no NPDES-permitted industrial dischargers and municipal dischargers within the Jefferson-German Lake Chain watershed. Stormwater runoff from construction activities is covered under NPDES/SDS General Stormwater Permit for Construction Activity (MNR100001). Stormwater runoff from industrial activities are covered under NPDES/SDS Industrial Stormwater Multi-Sector General Permit (MNR050000).

MPCA determined that industrial and construction stormwater contribute 0.1% of the TP loading for the Jefferson-German Lake Chain watershed. There are nine CAFOs in the Jefferson-German Lake Chain watershed (Figure 7.1 in the TMDL report).

The potential nonpoint sources to the five lakes of the Jefferson-German Lake Chain are:

- Upstream lakes (except for West Jefferson Lake)
- Unmonitored inflows within the Jefferson-German Lake Chain watershed (unregulated stormwater runoff)
- Monitored inflows from tributaries
- Atmosphere

MPCA determined that unmonitored inflows within the West Jefferson Lake watershed contribute 11% of the total phosphorus loading and that internal loading contribute 75% of the total phosphorus loading. Atmospheric deposition contributes 13% of the total phosphorus loading to West Jefferson Lake (Figure 6.0A in the TMDL report).

MPCA determined that unmonitored inflows within the Middle Jefferson Lake watershed contribute 4% of the total phosphorus loading and that monitored inflows contribute 28% of the total phosphorus loading. MPCA determined that West Jefferson Lake, a lake upstream of Middle Jefferson Lake, contributes 1% of the total phosphorus loading. Internal loading contributes 61% of the total phosphorus loading. Atmospheric deposition contributes 6% of the total phosphorus loading to Middle Jefferson Lake (Figure 6.0B in the TMDL report).

MPCA determined that unmonitored inflows within the Swedes Bay watershed contribute 2% of the total phosphorus loading and that monitored inflows contribute 15% of the total phosphorus loading. Internal loading contributes 82% of the total phosphorus loading. Atmospheric deposition contributes 2% of the total phosphorus loading to Swedes Bay (Figure 6.0C in the TMDL report).

MPCA determined that unmonitored inflows within the East Jefferson Lake watershed contribute 4% of the total phosphorus loading and that upstream contributions from Middle Jefferson Lake contribute 1% of the total phosphorus loading. MPCA determined that upstream lakes (Swedes Bay) contribute 32% of the total phosphorus loading. Internal loading contributes 59% of the total phosphorus loading. Atmospheric deposition contributes 5% of the total phosphorus loading to East Jefferson Lake (Figure 6.0D in the TMDL report).

MPCA determined that unmonitored inflows within the German Lake watershed contribute 3% of the total phosphorus loading and that monitored inflows contribute 31% of the total phosphorus loading. MPCA determined that upstream lakes contribute 12% of the total phosphorus loading. Internal loading contributes 47% of the total phosphorus loading. Atmospheric deposition contributes 7% of the total phosphorus loading to German Lake (Figure 6.0E in the TMDL report).

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

Jefferson-German Lake Chain is classified under Minnesota Rule 7050.0430 as Class 2B waters. Minnesota 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:

Jefferson-German Lake Chain is subject to Minnesota Eutrophication Standards, North Central Hardwood Forests Ecoregion. Numeric standards are given in Minnesota's Rule 7050.0222, with narrative standards in Minnesota's Rule 7050.0222 subpart 4a. According to the MPCA definition, a lake is considered shallow if its maximum depth is less than 15 feet or if the littoral zone for areas where water depth is less than 15 feet is greater than 80%. Based upon the physical data and lake morphology, Swedes Bay and Middle Jefferson Lake are classified by MPCA as shallow lakes, and West Jefferson Lake, East Jefferson Lake, and German Lake are subject to the general eutrophication standard (Table 4 of this Decision Document).

**Table 4.** Minnesota Eutrophication Standards, North Central Hardwood Forests Ecoregion[3]

| Parameter | Eutrophication Standard, General | Eutrophication Standard, Shallow Lakes |
|---|---|---|
| **TP (μg/L)** | TP < 40 | TP < 60 |
| **Chlorophyll-a (μg/L)** | chl-a < 14 | chl-a < 20 |
| **Secchi depth (m)** | SD > 1.4 | SD > 1.0 |
| **Lakes** | West Jefferson Lake, East Jefferson Lake & German Lake | Middle Jefferson Lake & Swedes Bay |

***Targets:***
To achieve the designated use and the applicable eutrophication criteria, MPCA incorporated a 10% explicit Margin of Safety (MOS) into the TP standard for the NCHF deep lake and shallow lake TP water quality standard. Therefore, the TP water quality targets were reduced to 36 μg/l for TP concentration for deep lakes (West Jefferson Lake, East Jefferson Lake and German Lake) and 54 μg/l for TP concentration for shallow lakes (Middle Jefferson Lake and Swedes Bay). By calculating the TMDL to meet the TP target of 36 μg/l and 54 μg/l, MPCA believes that all three parameters will be met by the TMDL (Section 2.1 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 steam 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.

[3] Table 2.1A, page 30, of the TMDL report.

**Comment:**
Table 5 of this Decision Document presents the loading capacity for Jefferson-German Lake Chain. The TMDL was calculated using average growing season TP loads from 2009 to 2010.

**Table 5.** Loading capacity for Jefferson-German Lake Chain

| Lake | TP WQS | Current loading (lb/year) | Load Reduction needed to meet WQS | Wasteload Allocation (lb/day) | Load Allocation (lb/day) | Margin of Safety | TMDL (lb/day) |
|---|---|---|---|---|---|---|---|
| West Jefferson Lake | 36 µg/l | 875 | 65% | 0.0003 | 0.8452 | 10% Explicit MOS applied to TP WQS & Implicit MOS | 0.85 |
| East Jefferson Lake | 36 µg/l | 3,748 | 69% | 0.0007 | 3.2251 | | 3.23 |
| German Lake | 36 µg/l | 3,256 | 61% | 0.0021 | 3.5172 | | 3.52 |
| Swedes Bay | 54 µg/l | 7,862 | 92% | 0.0027 | 1.7217 | | 1.72 |
| Middle Jefferson Lake | 54 µg/l | 2,954 | 81% | 0.0010 | 1.5324 | | 1.53 |

Four models were used to assess nutrient loading and to determine loading capacities for the lakes, including: the MINLEAP model; the Nürnberg equation (2004); use of wet and dry deposition rates from MPCA's Detailed Assessment of Phosphorus Sources to Minnesota Watersheds; and use of BATHTUB with the FLUX component for the water quality analyses.

BATHTUB has built-in statistical calculations which account for data variability and provide a means for estimating confidence in model predictions. BATHTUB employs a mass-balance TP model that accounts for water and TP inputs from tributaries, direct watershed runoff, the atmosphere, and sources internal to the lake, and outputs through the lake outlet, water loss via evaporation, and TP sedimentation and retention in the lake sediments. BATHTUB provides flexibility to tailor model inputs to specific lake morphometry, watershed characteristics and watershed inputs. The BATHTUB model also allows MPCA to assess different impacts of changes in nutrient loading and the choice among several different mass-balance TP models.

Watershed loading: MPCA used Minnesota Lake Eutrophication Analysis Procedure (MINLEAP) and FLUX to assess watershed loadings within the Jefferson-German Lake Chain watershed. MPCA first estimated hydrologic and eutrophication indicators using the MINLEAP model. MINLEAP is useful in that it requires minimal input of information and relies on general ecoregion values for stream phosphorus concentrations, precipitation, evaporation and runoff concentrations. These values are estimated based on reference lakes within the ecoregion. Due to its simplicity, MPCA considers MINLEAP as a screening tool and uses it to test for differences between the observed water quality conditions and the MINLEAP predicted water quality conditions.

MINLEAP tests for Jefferson-German Lake Chain confirmed that the lakes exhibit higher in-lake TP and chl-*a* concentrations than ecoregion reference lakes. The MINLEAP calculations of predicted TP, chl-a and Secchi depth values were then compared against the observed water quality data (from 2009-2010) for each lake. This comparison provides MPCA and watershed managers a rough estimate of the reductions necessary to meet water quality standards and to what degree the model should be calibrated to match observed values. This information was employed in the BATHTUB modeling efforts of the individual lake TMDLs.

The FLUX model was used to calculate TP loading from inflow drainage areas. The Nürnberg equation (2004) was used to calculate TP loading from internal loading. FLUX was used to calculate phosphorus and water budget loadings at sample sites JG6 to JG9 which were inlet locations at Jefferson-German Lake Chain. Measured inlet loads compared to outlet load at JG10 indicate the amount of TP accumulating within the lake each season. MPCA found that in 2010 the TP load of JG6 to JG9 was 1,625 kg/yr and the TP load of JG10 outlet location was 258 kg/yr. The FLUX model outputs were used as BATHTUB model inputs. MPCA used FLUX model outputs of 415 kg/yr TP at JG6, 838 kg/yr TP at JG7, 97 kg/yr TP at JG8, 375 kg/yr TP at JG9, and 132 kg/yr TP at JG10 as BATHTUB model inputs.

Appendix F provides further information on MINLEAP. Section 3.2 and Tables 3.2A and 3.2B of the TMDL report provide more information on MPCA's FLUX results.

Atmospheric Load: The use of wet and dry deposition rates from MPCA's Detailed Assessment of Phosphorus Sources to Minnesota Watersheds (MPCA cites Barr 2004 in Section 7.2F of the TMDL report) was used to calculate TP loadings from atmosphere (lb/ac/yr). Deposition rates from wet, dry, and average years were multiplied by the lake area (acres) to determine atmospheric loads (lb/yr). MPCA found atmospheric deposition to be a small percentage of the total load. MPCA calculated the average atmospheric deposition rate to be 0.28 lb/ac-yr.

Internal loading: Internal loading contributions were determined during the BATHTUB model runs. MPCA ran the BATHTUB model and set the internal load contributions based on BATHTUB modeling results and actual nutrient loads monitored in the watershed (Sections 5.1 and 7.2C of the final TMDL document).

Loading Capacity: Loading capacities were determined using Canfield-Bachmann equations from BATHTUB. The model equations were originally developed from data taken from over 704 lakes. The model estimates in-lake phosphorus concentration by calculating net phosphorus loss (phosphorus sedimentation) from annual phosphorus loads as functions of inflows to the lake, lake depth, and hydraulic flushing rate. To estimate loading capacity, the model is rerun, each time reducing current loads to the lake until the model result shows that in-lake total phosphorus would meet the applicable water quality standards. MPCA left the coefficients at default values and no calibration factors were applied to the response model. Predicted modeled and monitored TP values are presented in Appendix E of the TMDL report. The resulting loading capacities are shown in Tables 5 to 9 (Section 5.2, Tables 5.2A-F of the TMDL report).

Linking targets to water quality standards: The total phosphorus loading capacities are then input to the Canfield-Bachmann (BATHTUB) model. This time, the model calculates in-lake concentrations of phosphorus and Chl-a, and Secchi depth as if each lakes' phosphorus input were equal to the proposed loading capacity. The model results showed that if the phosphorus TMDL was met for each lake, the phosphorus, Chl-a, and Secchi depth water quality criteria would be achieved (Section 7.6 of the TMDL report).

**Table 6.** Total Phosphorus TMDL for Jefferson-German Lake Chain

| Lake | Allocation | Source | Existing (lb/yr) | TMDL (lb/yr) | Reduction (lb/yr) | Reduction (percent) |
|---|---|---|---|---|---|---|
| West Jefferson | Wasteload | Construction Stormwater | 0.10 | 0.06 | 0.04 | 38% |
| | | Industrial Stormwater | 0.10 | 0.06 | 0.04 | 38% |
| | Load | Local & Trib. Watersheds | 97 | 60 | 37 | 38% |
| | | Upstream Lakes | 0 | 0 | 0 | -- |
| | | Internal Load | 660 | 132 | 528 | 80% |
| | | Atmospheric | 117 | 117 | 0 | 0% |
| | | **Total Load** | **874** | **309** | **565** | **65%** |
| Middle Jefferson | Wasteload | Construction Stormwater | 0.95 | 0.19 | 0.76 | 80% |
| | | Industrial Stormwater | 0.95 | 0.19 | 0.76 | 80% |
| | Load | Local & Trib. Watersheds | 948 | 191 | 757 | 80% |
| | | Upstream Lakes | 15 | 10 | 5 | 33% |
| | | Internal Load | 1,812 | 181 | 1,631 | 90% |
| | | Atmospheric | 178 | 178 | 0 | 0% |
| | | **Total Load** | **2,955** | **560** | **2,394** | **81%** |
| Swedes Bay | Wasteload | Construction Stormwater | 1.3 | 0.5 | 0.8 | 62% |
| | | Industrial Stormwater | 1.3 | 0.5 | 0.8 | 62% |
| | Load | Local & Trib. Watersheds | 1,303 | 497 | 806 | 62% |
| | | Upstream Lakes | 0 | 0 | 0 | -- |
| | | Internal Load | 6,424 | 0 | 6,424 | 100% |
| | | Atmospheric | 132 | 132 | 0 | 0% |
| | | **Total Load** | **7,861** | **630** | **7,231** | **92%** |
| East Jefferson | Wasteload | Construction Stormwater | 0.15 | 0.13 | 0.02 | 13% |
| | | Industrial Stormwater | 0.15 | 0.13 | 0.02 | 13% |
| | Load | Local & Trib. Watersheds | 153 | 133 | 20 | 13% |
| | | Upstream Lakes | 1,210 | 323 | 886 | 73% |
| | | Internal Load | 2,212 | 548 | 1,664 | 75% |
| | | Atmospheric | 173 | 173 | 0 | 0% |
| | | **Total Load** | **3,748** | **1,178** | **2,570** | **69%** |
| German Lake | Wasteload | Construction Stormwater | 1.1 | 0.4 | 0.7 | 66% |
| | | Industrial Stormwater | 1.1 | 0.4 | 0.7 | 66% |
| | Load | Local & Trib. Watersheds | 1,109 | 377 | 732 | 66% |
| | | Upstream Lakes | 391 | 233 | 158 | 40% |
| | | Internal Load | 1,525 | 446 | 1,079 | 71% |
| | | Atmospheric | 229 | 229 | 0 | 0% |
| | | **Total Load** | **3,256** | **1,285** | **1,970** | **61%** |

Table 6 shows the current TP loading, load allocations, and TP reductions needed to meet the TP water quality standard that includes the 10% MOS for each lake.

EPA supports the data analysis and modeling approach utilized by MPCA in their calculation of wasteload allocations, load allocations and margin of safety for the Jefferson-German Lake Chain TMDL. Additionally, EPA concurs with the loading capacities calculated by the MPCA in the Jefferson-German Lake Chain TMDL. Further detail on Load Capacity can be found in Section 7.6 of the TMDL report.

*Critical conditions:*
Section 3.3 of the TMDL report and data presented in the TMDL report states that the critical conditions at Jefferson-German Lake Chain occur in the summer when TP concentrations peak and clarity is at its worst, often from July to September. Since the phosphorus standard is based on June through September water quality averages, the standard addresses the lake condition during critical conditions. The load reduction is designed so Jefferson-German Lake Chain will meet the water quality standard over the course of the growing season (June through September).

*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 7.2 of the TMDL report states that the LA is comprised of direct watershed inputs, including unregulated stormwater. MPCA calculated the stormwater loading using the area of total developed spaces, and multiplying them times the mean phosphorus runoff coefficients (ranging from 1.10 to 2.75 lb/ha) and recorded climatic data. The resulting values were inputs to the BATHTUB model. FLUX outputs for the inflows to Jefferson-German Lake Chain were used as phosphorus loadings to the lake. No reduction in atmospheric loading was calculated because MPCA concluded this source is not possible to control on a local basis.

Through enforcement and implementation measures, Le Sueur's County Department of Environmental Services has reduced the number of failing septic systems within the Jefferson-German Lake Chain watershed. MPCA explained that approximately 31 septic systems have been upgraded from 2000 to 2005. Due to the minimal and/or no inputs of TP to Jefferson-German Lake Chain from failing septic systems, MPCA determined that contributions from septic systems will not be accounted for directly in the TMDL nutrient budget. Table 6 of this Decision Document presents the load allocation for Jefferson-German Lake Chain. EPA concurs with the State's approach in determining the LA for which the Jefferson-German Lake Chain TMDL has been established.

EPA finds the MPCA's approach for calculating the LA to be reasonable. Section 7.2 in the TMDL report provides further detail on load allocation calculation by source.

*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 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 assigned a WLA for construction and industrial stormwater runoff for the Jefferson-German Lake Chain TMDL to account for future stormwater runoff due to construction and/or industrial activity. MPCA determined that 0.104% of the total TMDL load should be allocated to the WLA portion for construction and industrial stormwater runoff.

Jefferson-German Lake Chain and its surrounding watershed are not considered a part of a MS4 community and therefore have no WLA loading under the MS4 category. There are no municipal and industrial wastewater facilities in the Jefferson-German Lake Chain watershed and therefore no WLA loading was assigned under this category. Although there are nine NPDES-permitted CAFOs within the Jefferson-German Lake Chain watershed, a WLA loading was not assigned to the CAFOs since the permits generally do not allow for nutrient discharge. Table 6 of this Decision Document presents the WLA for Jefferson-German Lake Chain.

EPA finds the MPCA's approach for calculating the WLA to be reasonable.

*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 explicit MOS of 10% and an implicit MOS for the Jefferson-German Lake Chain TMDL. The explicit 10% MOS was applied to the TP water quality standard of 40 μg/l and 60 μg/l resulting in TP TMDLs of 36 μg/l and 54 μg/l. For the implicit MOS, conservative modeling assumptions included applying sedimentation rates from the Canfield-Bachmann model that likely under-predict the sedimentation rate for deep lakes. The Canfield-Bachmann equation does not account for the expected higher sedimentation rates (and thus phosphorus lost to the water column) expected in healthy deep lake systems. The model therefore overestimates the phosphorus concentration in the lake, and correspondingly overestimates the reductions needed to achieve the WQS.

Section 3.4 of the TMDL report provides further information on MOS.

*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:**
Seasonal variation was accounted for via loading capacity based on growing season averages for Jefferson-German Lake Chain and developing targets during the summer period (i.e., critical conditions). The TMDLs was set to meet TP standards during the summer period which is the most protective since critical conditions occur during the summer months. BATHTUB incorporates precipitation data and flow data over a two-year period thus capturing seasonal variations such as spring rain, snowmelt, and summer low flows.

Section 3.3 of the TMDL report provides further information on seasonal variation.

*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:**
The Jefferson-German Lake Chain nutrient TMDLs provide reasonable assurance that actions identified in the implementation strategy, as discussed in the TMDL in Section 9.0, will be applied to attain the loading capacities and allocations calculated for JGC nutrient TMDLs. The recommendations made by MPCA will be successful at improving water quality if the appropriate local groups work to implement these recommendations. Those mitigation suggestions, which fall outside of regulatory authority, will require commitment from state agencies and local stakeholders to carry out the suggested actions.

MPCA has identified local partners, such as the Greater Jefferson-German Lake Association (GJGLA), which has completed nutrient mitigation efforts within the JGC watershed. The GJGLA has been an active partner in the JGC watershed working on various projects aimed at improving water quality (i.e., septic source identification, shoreline restoration activities etc.). Implementation practices will be implemented over the next several years. Local groups are expected to work closely with one another to ensure that pollutant reduction efforts via BMPs are being implemented within the JGC watershed. Groups which would be expected to contribute to implementation efforts would be the GJGLA, the Cannon River Watershed Partnership, and the Soil and Water Conservation Districts (SWCD) for Le Sueur and Blue Earth counties.

Continued water quality monitoring within the basin is supported by MPCA. Additional water quality monitoring results could provide insight into the success or failure of BMP systems designed to reduce nutrient loading into the surface waters of the watershed. Local watershed managers would be able to reflect on the progress of the various pollutant removal strategies and would have the opportunity to change course if observed progress is unsatisfactory.

MPCA reasonably assures that the TP water quality standard will be achieved for Jefferson-German Lake Chain via the following:

1) 2011 Cannon River Watershed Management Strategy. The 2011 Cannon River Watershed Management Strategy includes implementation projects aimed at improving and restoring water quality at Jefferson-German Lake Chain. Details of the plan can be found at the Cannon River Watershed website (http://crwp.dreamhosters.com/wp-content/uploads/2013/01/Cover-and-Table-of-Contents.pdf ).
2) Implementation Plan for Jefferson-German Lake Chain. Following approval of the Jefferson-German Lake Chain TMDL, MPCA will work with the Cannon River Watershed and others to develop and approve an implementation plan within one year. The implementation plan will include the use of federal and state programs to improve and restore water quality in the lake.

3) Monitoring and water quality improvement projects conducted by Cannon River Watershed. Cannon River Watershed actively monitors Jefferson-German Lake Chain and manages water quality projects designed to improve water quality within its watershed.
4) *Clean Water Legacy Act (CWLA):* 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).
5) Reasonable assurance that the WLA set forth will be implemented is provided by regulatory actions. According to 40 CFR 122.44(d)(1)(vii)(B), NPDES permit effluent limits must be consistent with assumptions and requirements of all WLAs in an approved TMDL. MPCA's stormwater program and the NPDES permit program are some of the implementing programs for ensuring effluent limits are consistent with the TMDL. The NPDES program requires construction and industrial sites to create a Stormwater Pollution Prevention Plan (SWPPP) that summarizes how stormwater will be minimized from the site.

   The NPDES program requires construction and industrial sites to create SWPPPs which summarize how stormwater will be minimized from construction and industrial sites. Under the MPCA's Stormwater General Permit, managers of sites under construction or industrial stormwater permits must review the adequacy of local SWPPPs to ensure that each plan meets WLA set in the Jefferson-German Chain watershed TMDLs. In the event that the SWPPP does not meet the WLA, the SWPPP will need to be modified within 18-months of the approval of the TMDL by the U.S. EPA. This applies to sites under the MPCA's General Stormwater Permit for Construction Activity (MNR100001) and its NPDES/SDS Industrial Stormwater Multi-Sector General Permit (MNR050000) or NPDES/SDS General Permit for Construction Sand & Gravel, Rock Quarrying and Hot Mix Asphalt Production facilities (MNG490000).

*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:**
The Cannon River Watershed Management Strategy contains a detailed monitoring plan for Jefferson-German Lake Chain. Volunteers from the Citizen Lake Monitoring Program regularly monitor for water clarity at Jefferson-German Lake Chain. In addition, MPCA's Implementation Plan for the Jefferson-German Lake Chain TMDL will include a monitoring plan.

Section 10.0 of the TMDL report provides further information on monitoring.

*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 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. The draft TMDL Implementation Plan for Jefferson-German Lake Chain has been developed but not yet finalized. Final approval of the Implementation Plan by MPCA will occur once EPA finalizes the TMDL.

Section 8.0 of the TMDL report includes efforts to reduce external TP loadings to each Jefferson-German Lake Chain. Implementation of activities such as monitoring, agricultural best management practices (BMPs), developed land BMPs, and in-lake implementation activities is planned for Jefferson-German Lake Chain in partnership with the local governments in the watershed and MPCA.

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

*Stormwater runoff from agricultural land use practices:* Runoff from agricultural lands may contain significant amounts of nutrients which may lead to impairments in the JGC watershed. Manure spread onto fields is often a source of phosphorus, and can be exacerbated by tile drainage lines, which channelize the stormwater. Tile lined fields and channelized ditches enable particles to move more efficiently into surface waters. Phosphorus may be added via surface runoff from upland areas which are being used for Conservation Reserve Program (CRP) lands, grasslands, and agricultural lands used for growing hay or other crops. Stormwater runoff may contribute nutrients to surface waters from livestock manure, fertilizers, vegetation and erodible soils.

*Unrestricted livestock access to streams:* Livestock with access to stream environments may add nutrients directly to the surface waters or resuspend particles that had settled on the stream bottom. Direct deposition of animal wastes can result in very high localized nutrient concentrations and may contribute to downstream impairments. Smaller animal facilities may add nutrients to surface waters via wastewater from these facilities or stormwater runoff from near-stream pastures.

*Stream channelization and stream erosion:* Eroding streambanks and channelization efforts may add nutrients to local surface waters. Nutrients may be added if there is particulate phosphorus bound with eroding soils. Eroding riparian areas may be linked to soil inputs within the water column and potentially to changes in flow patterns. Changes in flow patterns may also encourage down-cutting of the streambed and streambanks. Stream channelization efforts can increase the velocity of flow (via the removal of the sinuosity of a natural channel) and disturb the natural sedimentation processes of the streambed.

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

*Urban/residential sources:* Nutrients may be added via runoff from urban/developed areas near the five lakes of the JGC watershed. Runoff from urban/developed areas can include phosphorus derived from fertilizers, leaf and grass litter, pet wastes, and other sources of anthropogenic derived nutrients.

*Wetland Sources:* Phosphorus may be added to surface waters by stormwater flows through wetland areas in the JGC watershed. Storm events may mobilize phosphorus through the transport of suspended solids and other organic debris.

*Forest Sources:* Phosphorus may be added to surface waters via runoff from forested areas within the watershed. Runoff from forested areas may include debris from decomposing vegetation and organic soil particles.

*Wildlife:* Wildlife is a known source of nutrients in water bodies as many animals spend time in or around water bodies. Deer, geese, ducks, raccoons, and other animals all create potential sources of nutrients. Wildlife contributes to the potential impact of contaminated runoff from animal habitats, such as urban park areas, forest, and rural areas.

Further detail on the type and extent of activities for all lakes is described in Section 8.0 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 stakeholder meetings took place throughout the TMDL development process. The stakeholder meetings took place on the following dates: April 22, 2009, November 12, 2009, June 17, 2010, April 20, 2011, and May 21, 2011. The stakeholders in attendance were concerned citizens, MPCA, MDNR, Minnesota Department of Transportation (MN/DOT), local officials, representatives from lake associations, and local governing agencies.

The Jefferson-German Lake Chain TMDL report was posted on the MPCA's website for public comment and review for a 30-day public comment period. MPCA held two public comment periods, the first was held from December 9, 2013 to January 9, 2014. The second public comment period took place from February 17, 2014 to March 3, 2014. During this time the MPCA received and responded to six comment letters from the public.

Comment letters submitted by Cannon River Watershed Partnership (CRWP), Le Sueur County Environmental Services and by Dan Girolamo requested further clarification on implementation efforts after the completion of the TMDLs. Each of the commenters cited source reduction challenges of attaining the water quality targets discussed in the TMDL. MPCA answered each commenter by acknowledging the challenges faced and asking for the commenters support in post-TMDL implementation efforts. MPCA also explained that the TMDL provides numeric goals for future planning and that working toward those goals will require appropriate land management efforts from point and nonpoint contributors, adaptive management of BMP efforts in accordance of existing laws and most importantly the support and commitment from landowners and other stakeholders. MPCA encouraged these three commenters to continue to work with the MPCA and other watershed groups toward attaining the goals of the TMDL.

A comment was submitted by the Lake Volney Association (LVA) and requested that MPCA include detail related to specific inflow sources to the JGC watershed and suggestions on potential specific implementation activities in the watershed. MPCA answered the requests of the LVA by updating the

TMDL document, where appropriate, and updating the discussion of the implementation section (Section 8.0) and the reasonable assurance section (Section 9.0) of the final TMDL document.

A comment was shared by Warren West which asked questions related to mitigation strategies to address internal load, source reduction of upland contributing areas and funding availability for restoration efforts in the JGC watershed. MPCA answered the concerns of Mr. West in its response and referenced the implementation plan which is anticipated to be developed after the completion of the TMDL and the Watershed Restoration and Protection Strategy (WRAPs) efforts for the Upper Cannon River watershed.

A comment was submitted from the Minnesota Department of Agriculture (MDA) and requested additional explanation to be included within the TMDL document related to; evaporation versus precipitation assumptions, local climate/precipitation data collected in the JGC watershed, agricultural drainage/tile drainage discussion of the implementation and reasonable assurance sections of the TMDL document, failing septic systems, agricultural BMPs and urban stormwater. MPCA agreed to update language within the Jefferson-German Lake Chain TMDL document as appropriate to answer the concerns raised by the MDA.

EPA believes that MPCA adequately addressed each of these comments and updated the final TMDL with appropriate language to address these comments. The MPCA submitted all of the public comments and responses in the final TMDL submittal packet received by the EPA on August 7, 2014.

*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 August 7, 2014, EPA received the Jefferson-German Chain of Lakes nutrient TMDLs, and a submittal letter dated August 3, 2014, signed by Rebecca J. Flood, Assistant Commissioner, addressed to Tinka Hyde, U.S. EPA, Region 5, Water Division. MPCA stated in the submittal letter, "I am pleased to submit two Total Maximum Daily Load (TMDL) studies to the U.S. Environmental Project Agency (EPA) for final approval: Lake Volney and Jefferson-German Lake Chain. These lakes are located in the Upper Cannon River Watershed and they are listed as impaired for excess nutrients." The submittal letter included the name and location of the waterbodies and the pollutant of concern.

*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 TP TMDLs for Jefferson-German Lake Chain satisfy all of the elements of an approvable TMDL. This Decision Document addresses **5 TMDLs** for **5 waterbodies** as identified on Minnesota's 303(d) list (Table 1 of this Decision Document).

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.