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

REPLY TO THE ATTENTION OF:
WW-16J

SEP 30 2011

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 (TMDLs) for Crystal Lake, Keller Lake, and Lee Lake, including supporting documentation and follow-up information. The lakes are located in Dakota County, Minnesota. The TMDLs address impairment of the aquatic recreation beneficial use due to elevated levels of total phosphorus.

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 3 TMDLs for total phosphorus for Crystal Lake, Keller Lake, and Lee Lake. 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 the 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: David Johnson, MPCA
Barbara Peichel, MPCA

wq-iw11-10g

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TMDL: Crystal, Keller, and Lee Lakes
Effective Date:

Decision Document for Approval of Crystal, Keller, and Lee Lakes, 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 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.

Comments:
The Minnesota Pollution Control Agency (MPCA) developed TMDLs for nutrients for three lakes, Crystal, Keller, and Lee Lakes, located within the Crystal Lake watershed in Dakota County, Minnesota. The TMDLs will address impairments of the aquatic recreation beneficial use in the watershed. Table 1 below identifies the waterbody segments covered by the TMDL as they appear on Minnesota's most recent 303(d) list. The three lakes are listed as impaired for aquatic recreation use due to algal blooms and excess aquatic plants impacting the swimming and fishing uses. Minnesota's priority ranking for TMDL waters are reflected by the target dates for start and completion of TMDL studies.

Table 1. 2002 303(d) List Summary

Waterbody	ID number	Listing Year	Affected Use	Pollutant or Stressor
Crystal Lake	19-0027-00	2002	Aquatic recreation	Excess nutrients
Keller Lake	19-0025-00	2002	Aquatic recreation	Excess nutrients
Lee Lake	19-0029-00	2002	Aquatic recreation	Excess nutrients

The lakes are located in an area managed by Black Dog Watershed Management Organization (BDWMO), in northwestern Dakota County, within the cities of Apple Valley, Burnsville, and Lakeville. The BDWMO is part of the larger Minnesota River Basin which ultimately drains to the Mississippi River. See Figure 1-1 of the TMDL for lake location and flow directions. The physical details for the lakes are in Table 2 below.

Table 2. Lake Characteristics

Parameter	Crystal Lake	Keller Lake	Lee Lake
Surface Area (ac)	208	52	18.6
Average Depth (ft)	10	4.8	7
Maximum Depth (ft)	35	8	15
Thermal Stratification	Throughout the growing season	None due to aquatic plants growing over entire lake bed in the shallow lake during summer	Throughout the growing season
Residence Time	Dimictic (i.e., mixes 2 times a year, fall and spring)	Polymictic (i.e., mixes multiple times a year)	Dimictic (i.e., mixes 2 times a year, fall and spring)
Watershed (ac) ((includes lake surface area))	3,667	1,447	206

Topography and Land Use:
Table 2 above lists the physical characteristics of the lakes. Based upon the physical data, Keller and Lee Lakes are classified by MPCA as shallow lakes (having a maximum depth less than 15 feet or more than 80% littoral). Crystal Lake is classified by MPCA as a deep lake (having a maximum depth of greater than 15 feet) (Section 2.1 of the TMDL).

The watersheds for the lakes vary slightly. As seen in Table 3 below, the primary land use for all three lake watersheds is low density residential ranging from 38% to 52.6%. Highway land use ranks second for all lake watersheds at 20% to 29%. The Crystal and Lee Lake watersheds are almost fully-developed and Keller Lake watershed is fully-developed. Crystal Lake is used for a variety of recreation uses by the public. Keller Lake is used for fishing, canoeing, and wildlife viewing for the local residents but has no beach or public access. Lee Lake has no public swimming beaches or public access and is used for aesthetic viewing and wildlife observations. Section 2 of the TMDL provides further detailed information.

Table 3. Land Use Characteristic—Lakes (%)

Land Use	**Crystal Lake**	**Keller Lake**	**Lee Lake**
Low Density Residential	41%	52.6%	38%
Highway	20%	20.5%	29%
Open Water	11%	5%	12%
Medium Density Residential	4%	1.8%	n/a
Natural, Park, & Open Space	6%	8%	1%
Commercial	7%	3.6%	11%
Developed Parks	0.5%	0.5%	n/a
Golf Course	2%	n/a	n/a
High Density Residential	2%	1.5%	n/a
Institutional	6%	6.5%	9%
Industrial Office	0.5%	n/a	n/a
Total	100%	100%	100%

Pollutant of Concern: The pollutant of concern for these 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. The TMDL also includes water quality data and information for the nutrient indicators chlorophyll-a and Secchi depth. Chlorophyll-a is a primary pigment in aquatic algae. Chlorophyll-a (Chl-a) levels correlate well with algal production. Secchi depth (SD) is an indicator for water clarity and quality and is measured by lowering a probe into the water until it can no longer be seen from the surface (Section 3 of the TMDL).

The lakes have been sampled periodically for total phosphorus (TP), chlorophyll-a, and Secchi depth. Water quality data are available for Crystal Lake from 1974 to 2008, 1996 to 2008 for Keller Lake, and 1994 to 2008 for Lee Lake. The water quality data used for the Lee Lake TMDL were from 1999 to 2008. The growing season means show that all lakes are exceeding the water quality standards.

All three lakes have been listed on Minnesota's Clean Water Act Section 303(d) list. Crystal Lake has exceeded the listing criteria on average from 1999 to 2008 for TP, Chl-a, and SD. From 1999 to 2008, the growing season mean TP concentration was 41.8 µg/l, growing season mean Chl-a was 24.5 µg/l, and growing season mean SD was 1.7 m. Table 3-2 of the TMDL summarizes Crystal Lake's data in comparison to the water quality standards.

Keller Lake has exceeded the listing criteria on average from 1996 to 2008 for TP, Chl-a, and SD. From 1996 to 2008, the growing season mean TP was 83.9 µg/l, growing season mean Chl-a was 28.5 µg/l, and growing season mean SD was 1.2 m. Table 3-3 of the TMDL summarizes Keller Lake's data in comparison to the water quality standards.

Lee Lake has exceeded the listing criteria on average from 1999 to 2008 for TP, Chl-a, and SD. From 1999 to 2008, the growing season mean TP concentration was 66.4 µg/l, growing season mean Chl-a was 24.3 µg/l, and growing season SD was 1.3 m. Table 3-4 of the TMDL summarizes Lee Lake's data in comparison to the water quality standards.

Pollutant sources:
Sources identified by MPCA in the TMDL as contributing to the nutrient impairments include watershed runoff, inflow from upstream loads, atmospheric deposition, and internal phosphorus release. MPCA determined that much of the phosphorus load in each lake is from internal loading. Depending on the hydrology, watershed runoff can be a significant portion of the overall phosphorus load into the lakes. Internal loads of phosphorus are a source for all three lakes. Phosphorus-rich sediments often settle out in the lakes, and when dissolved oxygen levels are reduced during the summer months, the phosphorus dissolves out of the sediment and into the water column. When the lake mixes during the spring and fall, the phosphorus-rich water is spread throughout the lake and is available for use by algae and plants.

There are five National Pollutant Discharge Elimination System (NPDES) municipal separate stormwater sewer systems in the watershed. No NPDES Concentrated Animal Feeding Operations (CAFOs), wastewater treatment facilities, or NPDES construction permits currently discharge to the watershed.

Future growth trends:
The Crystal Lake watershed is entirely within the Cities of Burnsville and Lakeville. Lee Lake is located entirely within the City of Lakeville. Although the City of Burnsville Comprehensive Plan states that a 6% increase in the current population is expected in the next 20 years, and the City of Lakeville Comprehensive Plan states that a 50% increase in the current population is expected in the next 20 years, MPCA has concluded that expected growth in the Cities of Burnsville and Lakeville will likely not be occurring within the Crystal and Lee Lake watersheds due to the watersheds being almost fully-developed. Since the Keller Lake watershed is fully-developed, the expected growth in the Cities of Burnsville and Apple Valley will not be occurring within the Keller Lake watershed. Future growth will not affect these TMDLs, and no significant growth is expected by MPCA.

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.

Comments:
Section 3.0 of the TMDL Study describes the designated uses and numeric criteria applicable to this watershed.

Use Designation: Crystal, Keller, and Lee Lakes are classified as Class 2B waters (MN. R. 7050.0430). The designated use addressed by this TMDL is aquatic recreation for 2B waters. Class 2 waters include waters which "do or may support fish, other aquatic life, bathing, boating, or other recreational purposes..." (MN R. 7050.0150(3)).

Numeric Standards: Minnesota has numeric criteria for nutrients that limit the quantity of nutrients entering waters (Table 4 below). MN R. 7050.0222(4) defines the numeric criteria, based upon ecoregions. Crystal Lake is classified by MPCA as a deep lake in the North Central Hardwood Forest ecoregion and Keller and Lee Lakes are classified by MPCA as shallow lakes in the North Central Hardwood Forest ecoregion (Section 3.0 of the TMDL). The applicable criteria are in Table 4 below:

Table 4. MPCA Deep and Shallow Lake Eutrophication Standards for Total Phosphorus, Chlorophyll-a, and Secchi disc for North Central Hardwood Forest Ecoregion (NCHF)

Water Quality Parameter	MPCA Lake Eutrophication Standard (NCHF)	
	Deep Lake	Shallow Lake
Total Phosphorus (µg/l)	≤40	≤60
Chlorophyll-a (µg/l)	≤14	≤20
Secchi disc (m)	≥1.4	≥1.0

Targets:
The lakes identified in the TMDL are within the boundaries of the NCHF ecoregion. The MPCA assumes that by meeting the loading capacity for total phosphorus (TP), the chlorophyll-a (chl-a) and the Secchi Disc (SD) depth water quality criteria will be attained.

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

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

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

TMDLs must take into account *critical conditions* for 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.

Comments:
Modeling summary. The loading capacity determinations used for Crystal, Keller, and Lee Lakes are based on two models, the Program for Predicting Polluting Particle Passage through Pits, Puddles, and Ponds (P8) and an in-lake mass balance (Sections 5.2.1, 5.3.1, and 5.4.1 of the

TMDL). P8 was used to calculate water and phosphorus loading rates for each lake and the in-lake mass balance was used to predict phosphorus loadings for each lake.

MPCA defined the scenario of existing conditions without current (2008) BMPs in P8 to calculate watershed loadings for all three lakes. This assumes existing land use without treatment by any BMPs in place, reflecting the maximum phosphorus loading scenario from the watershed. MPCA also defined the scenario of existing conditions with current (2008) BMPs as the current phosphorus loading from the watershed after BMP implementation.

MPCA used P8 results from the existing conditions with 2008 BMPs to calculate the loading capacity for all lakes. The estimated P8 loading to each lake was calculated for the following climatic conditions: a wet year (2001-02: 37.2 inches of precipitation); a dry year (2007-08: 25.9 inches of precipitation); and a year with near-average precipitation (2005-06: 31.8 inches of precipitation). The estimated P8 loadings to each lake for each event during the calibration periods can be found in Appendices B, C, and D.

After the loading rates from P8 were determined, the in-lake mass balance model was applied. The input parameters for the model are direct precipitation and evaporation data, a unique stage-storage discharge relationship developed for each lake, groundwater exchange, the water and total phosphorus loads from the watershed as predicted by P8 for wet, dry, and average climatic conditions, and water and phosphorus loads from upstream lakes for Crystal and Keller Lakes. The in-lake mass balance applied a series of empirical equations derived from assessments of lake data and performed steady state water and nutrient calculations based on lake morphometry and tributary inputs. After predicting steady-state phosphorus concentrations in the lake at the beginning of the calibration period (May to September), the model was calibrated to predict the observed total phosphorus concentrations in the lake during the calibration period for each climatic condition. The next step was to determine phosphorus loads from watershed inputs due to existing land uses using the following: (1) phosphorus loads from upstream lakes (if applicable), (2) atmospheric deposition directly onto the lake surface, (3) phosphorus loads from the direct watershed for each climatic condition predicted using the P8 model, and (4) phosphorus release from Curlyleaf pondweed (*Potamogeton crispus*) to estimate the total phosphorus concentration in the lake at each water quality sampling date. Estimated losses due to flushing, the operation of the ferric chloride system for (Keller Lake only), and uptake by Coontail (*Ceratophyllum demersum*) were also accounted for in the phosphorus mass balance model. Coontail is a macrophyte that absorbs its nutrients directly from the water column and its presence could impact the TP concentration observed in the lakes.

The internal load for each lake was estimated by the calibrated models. Each lake's estimated internal load was compared to the internal loading determined from sediment core analysis that was performed in 2008. The internal loading estimates from the calibrated models were used for all three lakes. For Keller Lake, the internal loading estimate was adjusted by a factor of 1.3 to account for the ferric chloride system. Further information on internal loading can be found on page 52 of the TMDL.

Tables 4-3, 4-5, and 4-7 of the TMDL present the existing TP loads and the external and internal TP loads for Crystal, Keller, and Lee Lakes.

Loading Capacity: To calculate the loading capacity for each lake, the existing conditions in-lake mass balance model was used to evaluate reductions in the loads to the lake that would result in average growing season phosphorus concentrations that achieve Minnesota's standard for the lake. The loading capacity developed to meet the phosphorus criteria of 40 µg/l for the Crystal Lake is **2.36 lbs/day**. The loading capacity developed to meet the phosphorus criteria of 60 µg/l for Keller Lake is **0.745 lbs/day**. The loading capacity developed to meet the phosphorus criteria of 60 µg/l for Lee Lake is **0.229 lbs/day**. 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 5. TMDLs for Total Phosphorus Expressed as Daily Loads for Crystal, Keller, and Lee Lakes

Lake	Wasteload Allocation (lbs/day)	Load Allocation (lbs/day)	Margin of Safety	Total Phosphorus TMDL (lbs/day)
Crystal Lake	0.884	1.476	Implicit and explicit	**2.361**
Keller Lake	0.553	0.192	Implicit and explicit	**0.745**
Lee Lake	0.122	0.107	Implicit and explicit	**0.229**

Critical conditions: The critical condition for all lakes is the summer growing season (June to September) mean concentration. The critical condition was used to estimate the required reduction of watershed and internal sources of phosphorus so that the predicted growing season average met the MPCA lake standard.

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 nonpoint sources and to natural background. Load allocations may range from reasonably accurate estimates to gross allotments (40 C.F.R. §130.2(g)). Where possible, load allocations should be described separately for natural background and nonpoint sources.

Comments:
Table 5 presents the LAs for each lake. Table 6 presents the detailed breakdown of the LA for each lake. Section 5 of the TMDL provides further information on the LA for each lake.

Table 6. Total Phosphorus LA for Average (i.e., Critical) Climatic Conditions

	Crystal Lake		Keller Lake		Lee Lake	
TP Source	***LA (lbs/yr)***	***LA (lbs/day)***	***LA (lbs/yr)***	***LA (lbs/day)***	***LA (lbs/yr)***	***LA (lbs/day)***
Atmospheric deposition	68	0.186	12	0.033	5	0.014
Keller Lake	40	0.110	--	--	--	--
Lee Lake	2	0.005	--	--	--	--
Internal Sources	429	1.175	58	0.159	34	0.093
Total	**539**	**1.476**	**70**	**0.192**	**39**	**0.107**

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.

Comments:
Table 5 presents the WLAs for each lake. Table 7 presents the detailed breakdown of the WLA for each lake. Section 5 of the TMDL provides further information on the WLA for each lake.

Table 7. Total Phosphorus WLA for Average (i.e., Critical) Climatic Conditions

	Crystal Lake		Keller Lake		Lee Lake	
TP Source	***WLA (lbs/yr)***	***WLA (lbs/day)***	***WLA (lbs/yr)***	***WLA (lbs/day)***	***WLA (lbs/yr)***	***WLA (lbs/day)***
Burnsville (MS400076)	67	0.183	82	0.225	--	--
Lakesville (MS400099)	230	0.630	--	--	37	0.101
Dakota County (MS400132)	8	0.022	6	0.016	2	0.005
MnDOT (MS400170)	18	0.049	--	--	6	0.016
Apple Valley (MS400074)	--	--	114	0.312	--	--
Total	**323**	**0.884**	**202**	**0.553**	**45**	**0.122**

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.

Comments:
Section 5.5 of the TMDL discusses the MOS. An explicit MOS was applied to each lake. MPCA reduced the phosphorus target for each lake by 10% (i.e., 54 µg/l TP for Keller and Lee Lakes, and 36 µg/l for Crystal Lake). MPCA believes this is appropriate based upon the calibration/validation analysis of the models used to determine the TMDLs. This analysis indicates that the model adequately represents the lake systems and therefore no additional MOS is needed.

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)).

Comments:
MPCA accounted for seasonal variation in the TMDLs by using three different precipitation years during the modeling process. The models were run using a wet, dry, and average year to determine the amount of loading variation based upon rainfall patterns. In addition, the P8 model uses daily precipitation records and snowmelt data to account for season variations in flow and resulting phosphorus loadings into the lakes (Appendix A of the TMDL)

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

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

Comments:
Section 5.8 details the information on Reasonable Assurance.

Watershed Management: The BDWMO's 1989 watershed management plan was updated and approved in 2002. The document includes data management protocols, a regulatory framework for water resource management, and protocols for addressing problems and issues as they relate to water resources. The regulated MS4 communities, Apple Valley, Burnsville, and Lakeville, have local watershed management plans following the requirements under the BDWMO watershed management plan.

NPDES MS4 Permits: The entire watershed is covered under NPDES regulation and Minnesota's general permit requiring MS4s to amend their NPDES Storm Water Pollution Prevention Programs (SWPPPs) to ensure consistency with applicable TMDL WLA requirements.

Monitoring: BDWMO will continue to monitor for water quality in Crystal, Keller, and Lee Lakes.

General redevelopment standards for MS4s: All regulated MS4s have stormwater management standards and rules to regulate water quality and runoff volumes resulting from new and redevelopment activities. Table 5-10 of the TMDL provides detailed information on redevelopment regulatory standards for Apple Valley, Burnsville, and Lakeville. MPCA believes redevelopment will occur in these cities.

Clean Water Legacy Act: The Clean Water Legacy Act (CWLA) is a statute passed in Minnesota in 2006 for the purposes of protecting, restoring, and preserving Minnesota's waters. 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. These plans are generally developed by third party groups, but may be developed by MPCA. 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. These efforts are expected to include informal and formal agreements and joint utilization of technical, educational, and financial resources. These cooperative efforts and coordination activities are to be included in the implementation plans. MPCA reviews and approves all plans. MPCA expects the implementation plans to be developed within a year of TMDL approval.

The CWLA also provides details on public and stakeholder participation in development and implementation of TMDLs and implementation plans, 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 for monitoring efforts to determine effectiveness of implementation efforts. MPCA has developed guidance on what is required in the implementation plans (Implementation Plan Review Combined Checklist and Comment, MPCA). To be eligible for CWLA funding, plans must include cost estimates, general timelines for implementation, and interim milestones and measures. The Minnesota Board of Soil and Water Resources administers the Clean Water Fund, and has developed a detailed grants policy explaining what is required to be eligible to receive Clean Water Fund money (FY '11 Clean Water Fund Competitive Grants Policy; Minnesota Board of Soil and Water Resources, 2011).

EPA finds that the TMDL document submitted by MPCA satisfies all requirements of 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 nonpoint sources, and the WLA is based on an assumption that nonpoint source load reductions will occur. Such a TMDL should provide assurances that nonpoint source controls will achieve expected load reductions and, such TMDL should include a monitoring plan that describes the additional data to be collected to determine if the load reductions provided for in the TMDL are occurring and leading to attainment of water quality standards.

Comments:
Regular monitoring for standard water quality parameters at Crystal, Keller, and Lee Lakes from April-October will continue under the BDWMO monitoring program (Section 6.1 of the TMDL). MPCA believes the monitoring will increase after best-management practices are installed, to track effectiveness. Once BMP projects are completed in all watersheds, BMP monitoring will take place to assure that BMPs are performing as designed and to achieve water quality standards. MPCA believes that achieving the WLA for Keller Lake will be difficult if typical stormwater management practices are implemented. To come up with alternative stormwater management practices that would meet or exceed the WLA for Keller Lake, monitoring of major surface inflows to Keller Lake is needed. The stormwater runoff water quality data will be used to aid in selecting appropriate alternatives.

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.

Comments:
The submitted TMDL Study does not contain a formal implementation plan, since it is not required as a condition for TMDL approval under the current U.S. EPA regulations. However, Section 7 of the TMDL does include an implementation framework and a summary of planned activities. The formal TMDL implementation plan will be finalized by MPCA upon approval of the Crystal, Keller, and Lee Lakes TMDL. The implementation plan will be conducted in two phases in addition to the ongoing activities. Ongoing and potential activities, identified by MPCA, for controlling nutrients in all lakes are summarized below (Table 7-1 of TMDL).

Loading Reduction Strategies

- Street sweeping
- Public Education and Outreach
- Retrofit BMPs
- Infiltration/filtration
- Redevelopment
- Upstream lake management
- Macrophyte management
- Inactivation of sediment phosphorus
- Aquatic communities studies

BDWMO and MPCA will apply for funding for future projects from the State Clean Water Partnership Funds, State Revolving Funds, Section 319 grants, Board of Water and Soil Resources grants, in addition to other available state and federal funding. BDWMO will be the project lead for coordinating and implementing projects that address internal phosphorus loading once funding has been obtained (Section 7.2 of the TMDL).

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.

Comments:
The Crystal, Keller, and Lee Lakes TMDL project was managed locally through BDWMO, Apple Valley, Burnsville, and Lakeville city staff. A technical advisory committee was established for the TMDL project in order to involve interested stakeholders. The committee included local cities, Dakota County, MPCA, Metropolitan Council, and BDWMO . All meetings were open to the public. The committee held meetings to discuss the Crystal, Keller and Lee Lakes TMDL project, on March 12, 2008; February 2, 2009; October 12, 2009; November 16, 2009; December 16, 2009; March 1, 2010; March 31, 2010; April 22, 2010; and May 10, 2010.

MPCA placed the Draft Crystal, Keller, and Lee Lakes TMDL on public notice from March 14, 2011 to April 13, 2011, to provide an opportunity for public comment. The draft TMDL was posted on MPCA's TMDL web site. EPA sent MPCA comments on the draft TMDL, and the comments were adequately addressed in the final TMDL. Five sets of comments were received during the TMDL public notice period. Public comments were 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.

Comments:
The transmittal letter from Rebecca J. Flood, Chief, Assistant Commissioner, MPCA, to Tinka Hyde, Director, Water Division, Region 5 EPA, was dated August 5, 2011. The letter stated clearly that this was a final TMDL submittal under Section 303(d) of the CWA. This decision document addresses the approval of three TMDLs submitted by MPCA. The TMDLs are for the waterbodies identified in Table 1.

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 phosphorus TMDLs for Crystal, Keller, and Lee Lakes satisfies all of the elements of an approvable TMDL. This decision document address **3** TMDLs for **3** waterbody segments as identified on Minnesota's 2010 303(d) list (see Table 1).

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.