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

AUG - 8 2012

REPLY TO THE ATTENTION OF:

WW-16J

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

Dear Ms. Flood:

The U.S. Environmental Protection Agency has conducted a complete review of the final Total Maximum Daily Load (TMDL) for Lake St. Croix in eastern Minnesota (ID 82-0001) and western Wisconsin (ID 2601500), including supporting documentation and follow up information submitted jointly by the Minnesota Pollution Control Agency (MPCA) and the Wisconsin Department of Natural Resources (WDNR). The St. Croix River and Lake St. Croix form a portion of the border between Minnesota and Wisconsin. The river flows southward into Lake St. Croix, which extends 24 miles downstream from Stillwater to Prescott, where it flows into the Mississippi River. The lake is located in Washington County, Minnesota and in St. Croix and Pierce Counties, Wisconsin. The TMDL was calculated for Total Phosphorus to address excess nutrients. The designated use impairment in the lake is aquatic recreational use, and Lake St. Croix is classified as a Class 2B water and is defined as and protected for aquatic life (warm and cool water fisheries and associated biota) and recreation (all water recreation activities including bathing). Because these are multi-jurisdictional waters, both Minnesota and Wisconsin concurred that the more stringent Minnesota standards be used in the development of this TMDL.

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

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

Sincerely,

For Tinka G. Hyde
Director, Water Division

Enclosure

cc: Dave L. Johnson, MPCA
Chris Zadak, MPCA

wq-iw6-04g

TMDL: Lake St. Croix, Minnesota and Wisconsin
Date: December 2012 (revised)

DECISION DOCUMENT FOR THE APPROVAL OF THE LAKE ST. CROIX, MINNESOTA and WISCONSIN, TMDL

Section 303(d) of the Clean Water Act (CWA) and EPA's implementing regulations at 40 C.F.R. Part 130 describe the statutory and regulatory requirements for approvable TMDLs. Additional information is generally necessary for EPA to determine if a submitted TMDL fulfills the legal requirements for approval under Section 303(d) and EPA regulations, and should be included in the submittal package. Use of the verb "must" below denotes information that is required to be submitted because it relates to elements of the TMDL required by the CWA and by regulation. Use of the term "should" below denotes information that is generally necessary for EPA to determine if a submitted TMDL is approvable. These TMDL review guidelines are not themselves regulations. They are an attempt to summarize and provide guidance regarding currently effective statutory and regulatory requirements relating to TMDLs. Any differences between these guidelines and EPA's TMDL regulations should be resolved in favor of the regulations themselves.

1. Identification of Waterbody, Pollutant of Concern, Pollutant Sources, and Priority Ranking

The TMDL submittal should identify the waterbody as it appears on the State's/Tribe's 303(d) list. The waterbody should be identified/georeferenced using the National Hydrography Dataset (NHD), and the TMDL should clearly identify the pollutant for which the TMDL is being established. In addition, the TMDL should identify the priority ranking of the waterbody and specify the link between the pollutant of concern and the water quality standard (see section 2 below).

The TMDL submittal should include an identification of the point and nonpoint sources of the pollutant of concern, including location of the source(s) and the quantity of the loading, e.g., pounds/per day. The TMDL should provide the identification numbers of the NPDES permits within the waterbody. Where it is possible to separate natural background from nonpoint sources, the TMDL should include a description of the natural background. This information is necessary for EPA's review of the load and wasteload allocations, which are required by regulation.

The TMDL submittal should also contain a description of any important assumptions made in developing the TMDL, such as:

(1) the spatial extent of the watershed in which the impaired waterbody is located;
(2) the assumed distribution of land use in the watershed (e.g., urban, forested, agriculture);
(3) population characteristics, wildlife resources, and other relevant information affecting the characterization of the pollutant of concern and its allocation to sources;

(4) present and future growth trends, if taken into consideration in preparing the TMDL (e.g., the TMDL could include the design capacity of a wastewater treatment facility); and (5) an explanation and analytical basis for expressing the TMDL through *surrogate measures*, if applicable. *Surrogate measures* are parameters such as percent fines and turbidity for sediment impairments; chlorophyll *a* and phosphorus loadings for excess algae; length of riparian buffer; or number of acres of best management practices.

Comment:
Location Description/Spatial Extent: This TMDL is for Lake St. Croix on the St. Croix River, and is a joint submittal by both the Minnesota Pollution Control Agency (MPCA) and the Wisconsin Department of Natural Resources (WDNR). Sections 1 and 2.1 of the TMDL state that Lake St. Croix is a naturally occurring riverine lake located at the south end of the St. Croix River; this TMDL is only for the lake. The St. Croix drainage basin drains an area of 7,760 square miles. A total of 56% of the basin land area is located in Wisconsin, and the remaining 44% of the basin is in Minnesota. The St. Croix River and Lake St. Croix form a portion of the border between Minnesota and Wisconsin, in eastern Minnesota (ID 82-0001) and western Wisconsin (ID 2601500). The river flows southward toward the lake which is comprised of four pools: Bayport, Troy Beach, Black Bass, and Kinnickinnic. The lake extends 24 miles downstream from Stillwater to Prescott, where it flows into the Mississippi River. Three large tributaries also contribute 11% of the flow through the lake, and the Mississippi River has a large influence on the lake level as well.

The lake and river are predominantly within the North Central Hardwoods Forest ecoregion as defined in MPCA regulations. The lake itself is located in Washington County, Minnesota and in St. Croix and Pierce Counties, Wisconsin. The soil is predominantly a medium to coarse sandy glacial deposit. The portion of the St. Croix River under Minnesota's jurisdiction is designated an Outstanding Resource Value Water; the portion under Wisconsin's jurisdiction is considered an Outstanding Resource Water. The designation in Minnesota results in allowing no new or expanded discharge of any sewage, industrial waste, or other waste (unless there is no prudent or feasible alternative); in Wisconsin, the designation requires that the water quality of any discharge match the background quality of the river. The river was included in the National Wild and Scenic Rivers Act; the Act was signed into law on October 2, 1968. The upper portion of the St. Croix was designated as the St. Croix National Scenic Riverway in 1968 as part of the Act, and the lower portion was added in 1972. The Act requires that the federal government protect wild and scenic rivers from development that would substantially change their nature showing outstandingly remarkable scenic, recreational, geologic, fish and wildlife, historic, cultural, or other similar values. Further, the waters are preserved as free flowing rivers and not dammed or impeded.

Phosphorus loads were calculated for each state, using the land use data. The basin includes a portion of Tribal Lands of the Mille Lacs Band of Ojibwe and the Fond du Lac Band of Chippewa in Minnesota and the St. Croix Band of the Chippewa in Wisconsin. A total of 3,363 acres of Tribal Lands are present in the Minnesota portion of the St. Croix River Watershed, and 4,833 acres of Tribal Lands are present in the Wisconsin portion of the St. Croix River Watershed. Appendix D of the TMDL contains further information on the land use for the Tribal Lands. No

TMDL reductions will be required since the locations are not within state jurisdiction, but loading from these areas were identified in the TMDL process.

Land use: Section 2.4 of the TMDL describes the watershed land use in the upper two thirds of the basin as formerly forest and peatlands. The lower basin was forested and had many grass species. Since that time, the area was heavily logged. Agriculture replaced a large portion of the deforested area, but some locations, particularly in the northern basin, are reverting back to forested land use, including second growth forests, parks, and wildlife management areas. The southern portion of the basin is predominantly dairy farming and row-crop agriculture. Table 4 below is taken from the TMDL and shows the National Land Cover Data (NLCD) from 1992 land use by state and the entire basin. Approximately 56% of the entire basin is forest, 17% is grassland, 16% is agriculture, 9% water, and the remaining is shrubland and urban. Forested land use is 80-90% of the Namekagon, Totagatic, Upper St. Croix, Upper and Lower Tamarack, and Crooked subwatersheds (the uppermost subwatersheds in the basin).

Table 4. Land Use/Land Cover Areas (NLCD 1992)

	Area in Land Use / Land Cover* (acres)						
Basin part	**Agricultural**	**Forest**	**Grassland**	**Shrubland**	**Urban**	**Water**	**Total**
Minnesota	239,253	1,241,595	474,935	6,698	22,023	266,687	2,251,192
Wisconsin	556,639	1,517,071	366,560	36,534	12,765	170,444	2,660,014
Basin	**795,892**	**2,758,665**	**841,496**	**43,233**	**34,789**	**437,131**	**4,911,206**

Problem Identification: Section 1 of the TMDL states that the excessive phosphorus loading drives nuisance algal blooms in Lake St. Croix; eutrophication standards for phosphorus, chlorophyll *a*, Secchi depth are exceeded. Section 2.5 of the TMDL states that although the St. Croix River generally has good water quality conditions when compared to other Midwestern rivers, excessive nutrients in the lake are transported from tributaries in both the northern and southern portion of the study area. Even a single storm event can greatly affect the loading from tributaries to the St. Croix River. During the study period from 1997 to 1998, storm events and subsequent loading in the southern tributary basins was small, whereas during the same timeframe the northern tributaries experienced more storm events and more loading. Although there can be great variation due to the disparity of storm events and subsequent loading across the basin, the average in-lake water quality at the southern end of the basin in Lake St. Croix is impaired.

Pollutant of Concern: The pollutant of concern is excess nutrients (phosphorus).

Source Identification: Section 4 of the TMDL explains that both point and nonpoint sources contribute to the excess nutrients impairment. The point sources include municipal and industrial wastewater, regulated stormwater, and concentrated animal feeding operations (CAFOs).

The nonpoint sources are anthropogenic and natural background. Anthropogenic nonpoint sources are dominant, and agriculture is the largest contributing source. Stormwater runoff from cropland, pasture and feedlots, and stormwater runoff from urban locations can contain

phosphorus, as well as causing stream channel and ravine erosion that transports phosphorus-rich soils to the waterbodies. Natural background can include surface runoff and channel erosion, groundwater discharge, and atmospheric deposition. There may also be internal lake loading due to release from lake sediments. Though there is a wastewater treatment facility serving the St. Croix Band of the Chippewa, in the Sand Lake Community west of Hertel, Wisconsin, the facility is not included in the TMDL allocations because it is not within the jurisdiction of the state.

In Section 5.3 of the TMDL, MPCA and WDNR determined the influence of land use/land cover on existing runoff conditions via phosphorus export to the river (see Table 10 below). The greatest phosphorus export coefficients are in agricultural and urban land uses. Section 2.4 of the TMDL shows the land covered by Municipal Separate Storm Sewer Systems (MS4) permits and notes that the urban land use category is not as "developed" as the name implies, because approximately 90% of the land use within the MS4 category is in a non-urban setting. The municipalities and permit numbers are listed in Appendix A of the TMDL and in the WLA Section of this document.

Table 10. Existing (1990s) Phosphorus Export Coefficients for Land Use/Land Cover Categories

		Agriculture	Forest	Grassland	Shrubland	Urban	Water*
Step	Description	(kilograms per hectare per year)					
1	First estimates	0.75	0.10	0.25	0.10	0.75	0.05
2	Subtract natural backgrnd	0.658561	0.008561	0.158561	0.008561	0.658561	0.008561
3	Adjust to 1990s load	0.536970	0.006980	0.129286	0.006980	0.536970	0.006980
4	Add natural background	0.628409	0.098419	0.220725	0.098419	0.628409	0.006980

*In lieu of subtracting the natural background export (0.091439 kg/ha-yr) from water's first estimate, water's export was set equal to the forest and shrubland value in step 2.

Priority Ranking: Section 3 of the TMDL submittal states that the priority ranking for the MPCA is based on several factors, including the impacts on both public health and aquatic life; the public value of the resource; the likelihood of completing the TMDL, assuming that there are enough data and the potential for restoration; local interest and technical capability; and appropriate sequencing of TMDLs within a basin.

MPCA is also prioritizing locations for implementation based on phosphorus loading and phosphorus export, or load per unit area. The export values are generally more important for the implementation phase; total loading would not address the problem as well because the larger watershed simply yields larger loading. The southern portion of the watershed has the 13 highest-exporting subwatersheds in the basin. These 13 subwatersheds encompass 26% of the basin area but produce 39% of the existing basin phosphorus load.

Future growth: As discussed in Section 5.2 of the TMDL, the St. Croix Basin has a projected population growth of 39% by the year 2020, and water quality in Lake St. Croix will likely continue to degrade. Therefore, the Basin Team established a 20% overall reduction goal in total phosphorus, which is the approximate ecological condition of Lake St. Croix in the 1940's, after European settlement but before large increases in nutrient loadings during 1950 - 60. Further, future growth was considered by adding some facilities in the TMDL development that will be

operational in the near future in Wisconsin. More of the nutrient loadings will be discussed in the methodology section of this document.

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

2. Description of the Applicable Water Quality Standards and Numeric Water Quality Target

The TMDL submittal must include a description of the applicable State/Tribal water quality standard, including the designated use(s) of the waterbody, the applicable numeric or narrative water quality criterion, and the antidegradation policy. (40 C.F.R. §130.7(c)(1)). EPA needs this information to review the loading capacity determination, and load and wasteload allocations, which are required by regulation.

The TMDL submittal must identify a numeric water quality target(s) – a quantitative value used to measure whether or not the applicable water quality standard is attained. Generally, the pollutant of concern and the numeric water quality target are, respectively, the chemical causing the impairment and the numeric criteria for that chemical (e.g., chromium) contained in the water quality standard. The TMDL expresses the relationship between any necessary reduction of the pollutant of concern and the attainment of the numeric water quality target. Occasionally, the pollutant of concern is different from the pollutant that is the subject of the numeric water quality target (e.g., when the pollutant of concern is phosphorus and the numeric water quality target is expressed as Dissolved Oxygen (DO) criteria). In such cases, the TMDL submittal should explain the linkage between the pollutant of concern and the chosen numeric water quality target.

Comment:
Designated Use and Standards: Section 3 of the TMDL states that the lake is classified in Minnesota as a Class 2B, 3C, 4A, 4B, 5, and 6 water, and that Class 2B is the most protective. In 2008, Lake St. Croix had been listed for aquatic recreation use impairment of a Class 2B water. Class 2B is defined in Minn. Rules 7050.0222, Subp. 4 as follows:

> "The quality of Class 2B surface waters shall be such as to permit the propagation and maintenance of a healthy community of cool or warm water sport or commercial fish and associated aquatic life, and their habitats. These waters shall be suitable for aquatic recreation of all kinds, including bathing, for which the waters may be usable. This class of surface water is not protected as a source of drinking water."

Minnesota Standards: Minnesota uses three indicators for nutrient standards, total phosphorus (the causal factor) and either chlorophyll *a* or Secchi disc depth (response factors). Section 3 of the TMDL describes that Minnesota's lakes were assessed for nutrient impairment based on the narrative water quality standard, then numeric translators were used to derive numeric standards as described in Minnesota Rules 7050.0150 and accompanying assessment guidance. MN R. 7050.0222(4) defines the resulting numeric criteria based on ecoregions, and can be found below in Table 5 (TP 40µg/l).

Wisconsin Standards: Wisconsin promulgated numeric standards for phosphorus since the TMDL was begun. Wisconsin Rules went into effect December 1, 2010.

- Chapter NR 102.06(3)a – for streams/rivers named in the code and that have unidirectional flow - 100 µg/l.
- Chapter NR 102.06(3)b – considered streams but not named in the code that have unidirectional flow - 75 µg/l.
- Chapter NR 102.06(4) – for lakes/reservoirs - 40 µg/l to 15 µg/l.

While classified as a lake, Section 3 of the TMDL explains that Lake St. Croix is atypical of a lake because of its riverine characteristics, including a shorter residence time and different depth characteristics than most lakes. The lake exhibits unidirectional flow measured at Stillwater and Prescott, located at each end of the lake. Those waterbodies that have unidirectional flow but are not named in the code receive a standard of 75 µg/l (Table 5 below).

Targets for this TMDL: the 40µg/l phosphorus standard is the target. The St. Croix Basin Team determined the target value of 40 µg/L because the more stringent standard of the two states must be used for a multijurisdictional location. The St. Croix Basin Team also did further analysis to determine the effects of attaining the total phosphorus criteria on the response variables of chlorophyll *a* and Secchi depth, and determined that this target would achieve the desired recreational and ecological goals.

Table 5 below from the TMDL shows the results of this analysis. Attaining the 40 µg/l of phosphorus should result in a chlorophyll *a* target of 12 µg/L and a Secchi depth of 1.5 m meeting the MPCA criteria for Lake St. Croix. These values are more stringent than the current standard of 14 µg/l and 1.4 m, but are chosen to achieve lake conditions that were present before the increased stresses of agricultural runoff loads of phosphorus that occurred after the 1940s. More details are explained in the methodology section of this document, but the overall ecological goal is to achieve more benthic algal conditions rather than planktonic.

Table 5. Lake St. Croix Minnesota and Wisconsin Standards and Basin Team's Goals

Water Quality Parameter	Minnesota Standards (NCHF Ecoregion, deep lakes)	Wisconsin Standards	St. Croix Basin Team Goals
Averaging Period	June-September mean		May-September median
Total Phosphorus, µg/L	40	75	40
Chlorophyll-a, µg/L	14		12
Secchi disc transparency, m	1.4		1.5

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

3. Loading Capacity - Linking Water Quality and Pollutant Sources

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

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

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

TMDLs must take into account *critical conditions* for stream flow, loading, and water quality parameters as part of the analysis of loading capacity. (40 C.F.R. §130.7(c)(1)). TMDLs should define applicable *critical conditions* and describe their approach to estimating both point and nonpoint source loadings under such *critical conditions*. In particular, the TMDL should discuss the approach used to compute and allocate nonpoint source loadings, e.g., meteorological conditions and land use distribution.

Comment:
Table 17 is taken directly from Section 5.2 of the TMDL submittal and shows the basin-wide portioning of the capacity into WLA, LA, Tribal loads, the margin of safety, and the reserve capacity. While the Table contains Tribal loads, the loads are for reference only, and are not part of this TMDL decision. Tables 18 and 19 are at the end of this document and show the loading capacity values allocated by state.

TMDL Summary in pounds/day phosphorus

Total Maximum Daily Load	Wasteload Allocation	Load Allocation	Margin of Safety	Reserve Capacity	Tribal Load*
2172.8	240.9	1790.3	108.6	29.0	4.0

* Tribal loads are for reference only and are not part of the TMDL approval

Table 17. Lake St. Croix TMDL Phosphorus Allocations - Basin-wide

	Existing (1990s)	TMDL	Existing (1990s)	TMDL
Component	(metric tons/yr)		(pounds/day)	
Non-Regulated Loads (LAs)	**397.369**	**296.604**	**2398.5**	**1790.3**
Watershed background	165.559	165.559	999.3	999.3
Watershed land use	224.274	123.509	1353.7	745.5
Internal	7.095	7.095	42.8	42.8
Atmospheric	0.441	0.441	2.7	2.7
Wasteloads (WLAs)	**61.975**	**39.924**	**374.1**	**240.9**
MS4 Permitees	8.743	4.688	52.8	28.3
Wastewater Facilities	51.914	33.994	313.3	205.2
General Permits - WI	1.000	1.000	6.0	6.0
Construction runoff - MN	0.159	0.121	1.0	0.7
Industrial runoff - MN	0.159	0.121	1.0	0.7
Reserve Capacity (RC)	--	**4.816**	--	**29.0**
RIB conversions - WI	--	1.929	--	11.6
Non-contributing - WI	--	0.396	--	2.4
ISTS conversions	--	2.491	--	15.0
Tribal Load (TL)	**0.656**	**0.656**	**4.0**	**4.0**
Watershed runoff	0.352	0.352	2.1	2.1
Wastewater	0.304	0.304	1.9	1.9
Margin of Safety (MOS)	--	**18.000**	--	**108.6**
Total Load	**460.000**	**360.000**	**2776.6**	**2172.8**

Note – Tribal loads are for reference only.

Method for cause and effect: The methodology for this TMDL uses the BATHTUB model for chlorophyll *a* and Secchi depth, but then uses a unique method to determine a phosphorus baseline based on Lake St. Croix cored samples. BATHTUB is a steady state model that predicts eutrophication response based on empirical formulas developed for nutrient balance calculations and algal response. The model requires nutrient loading inputs from the upstream watershed and atmospheric deposition, morphometric data for the lake, and estimates of mixing depth and nonalgal turbidity.

The cores establish inferred amounts of phosphorus based on diatomaceous algal remains and several dating methods to reconstruct histories from 1800 to 2000. The algal remains amounts were evaluated in several time intervals, settlement (1800's to 1950) and post-1950 when there was a major shift in phosphorus inflows. Lake St. Croix experienced more than a doubling of phosphorus loading and lake TP concentration, which triggered a switch from a benthic to planktic diatom community, beginning around 1950 (see Figure 7 below from the TMDL). Section 3 of the TMDL states that a benthic algal community achieves better water quality than a nuisance and free floating (planktic) algal community. Therefore, the goal of this TMDL is to achieve the phosphorus amounts that existed before the influx of agricultural runoff beginning in the 1950s (not to pre-settlement values). The study determined:

- water-column TP concentrations;
- overall P loads and sediment loads to the lake;
- diatom community trends;
- Decadal-scale histories from 1930 to 2000; and,
- 20- to 50-yr scales covering the period from 1800 to 1930.

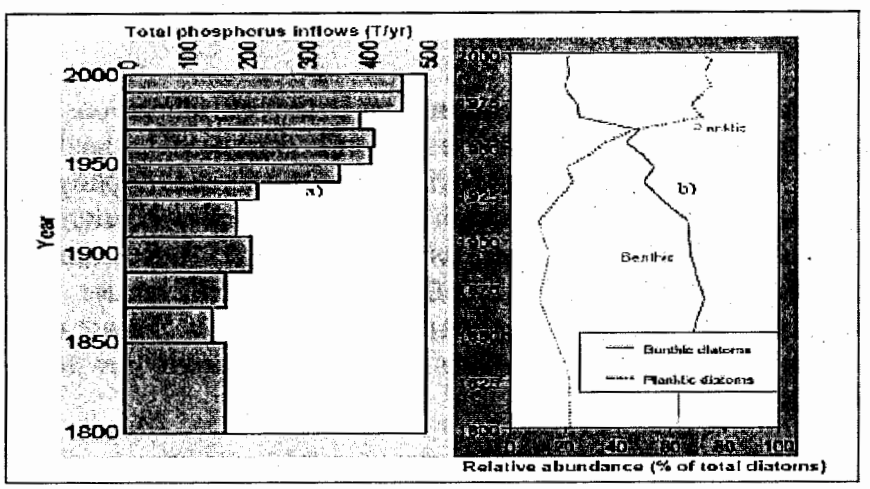

Figure 7. Historical reconstruction of a) total phosphorus loads of Lake St. Croix inflows and, b) diatom relative abundance (from Davis 2004)

The results of the analysis of the core samples confirmed that the 40 µg/L phosphorus standard is appropriate for attaining the historical background water quality for Lake St. Croix, and will likely result in attaining a chlorophyll *a* target of 12 mg/L and a Secchi depth of 1.5 meters, which are more stringent than the existing water quality criteria. Distribution of the allocations are described in Section 5.4 of the TMDL for wastewater treatment facilities (individual and aggregate), runoff load, regulated stormwater, tribal lands, MOS, and reserve capacity.

Tribal Lands – Monitoring records for the Hertel Tribal Facility and runoff from land use on tribal lands were used to determine phosphorus loading. As stated previously, no TMDL allocations will be established for Tribal loads or reductions required since the location is not within state jurisdiction, but loading from these areas has been identified in the TMDL process.

Critical Conditions: Section 5.5 of the TMDL states that the critical condition is in the summer growing season from June to September, and these conditions were incorporated into the allocation processes. The phosphorus loading may vary greatly during this timeframe, so the growing season mean concentration is used.

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

4. Load Allocations (LAs)

EPA regulations require that a TMDL include LAs, which identify the portion of the loading capacity attributed to existing and future nonpoint sources and to natural background. Load allocations may range from reasonably accurate estimates to gross allotments (40 C.F.R. §130.2(g)). Where possible, load allocations should be described separately for natural background and nonpoint sources.

Comment:
As stated previously, anthropogenic nonpoint sources are dominant in the load allocations, and agriculture is the largest contributing source. The phosphorus export is dominated by land use type (Section 5.4 of the TMDL). The phosphorus export coefficient is the amount of phosphorus exported from each land use per acre. A specific phosphorus export coefficient was determined for each land use (agricultural, forest, grassland, shrubland, urban, and water). Agricultural and urban land uses typically have higher phosphorus export coefficients due to fertilizer use, animal/pet waste, organic debris, and likely higher phosphorus levels in the soils. Forest and shrublands typically have low phosphorus export coefficients, as there are generally few sources of phosphorus available to wash off the land.

MPCA and WDNR determined the existing phosphorus export coefficients, which were then used to calculate the existing run-off loads consistent with the core samples discussed in Section 3 above. The coefficients for three land uses (agricultural urban, and grassland) were adjusted until the coefficients resulted in loads that met the loading capacity (Section 5.4 of the TMDL). Section 5.1 of the TMDL states that the internal phosphorus is from lake bottom sediments, and atmospheric loading is directly on the lake's surface via precipitation and dryfall. Nonpoint source runoff outside of MS4 boundaries includes natural background runoff and runoff as a result of human alteration of land use.

Section 5.6 of the TMDL defines the watershed land use load as that load resulting from human alterations of the landscape (agriculture and urban development). For this TMDL, other man-made influences (MS4s, Tribal, industrial and construction) are considered separately. Table 16 below illustrates that the contribution of agriculture and urban use runoff compared to the total anthropogenic runoff to be significant in both states. For the total basin, approximately 123,000 tons/year TP of a total 129,000 tons/year TP is from watershed land use. Since the greatest future change in the watershed is anticipated to be from agricultural to urban and they have the same export coefficients for the existing anthropogenic load (Table 10 above, Step 3 values), the current land cover calculation is appropriate for future conditions as well.

Table 16. TMDL Anthropogenic Runoff Load Distribution

	Phosphorus Load (metric tons/yr)		
Load Component	**Minnesota**	**Wisconsin**	**Basin**
Anthropogenic runoff	**47.772**	**81.019**	**128.791**
MS4 permittees	3.995	0.693	4.688
Tribal runoff load	0.132	0.220	0.352
Construction runoff - MN	0.121	–	0.121
Industrial runoff - MN	0.121	–	0.121
Subtotal	4.369	0.913	5.282
Watershed land use	**43.403**	**80.106**	**123.509**

The Load Allocation is 1790.3 pounds/day as shown in Table 17 below from the TMDL submittal. Tables 18 and 19 are at the end of this document and show the load allocations by state.

Table 17. Lake St. Croix TMDL Phosphorus Allocations - Basin-wide

	Existing (1990s)	TMDL	Existing (1990s)	TMDL
Component	(metric tons/yr)		(pounds/day)	
Non-Regulated Loads (LAs)	**397.369**	**296.604**	**2398.5**	**1790.3**
Watershed background	165.559	165.559	999.3	999.3
Watershed land use	224.274	123.509	1353.7	745.5
Internal	7.095	7.095	42.8	42.8
Atmospheric	0.441	0.441	2.7	2.7

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

5. Wasteload Allocations (WLAs)

EPA regulations require that a TMDL include WLAs, which identify the portion of the loading capacity allocated to individual existing and future point source(s) (40 C.F.R. §130.2(h), 40 C.F.R. §130.2(i)). In some cases, WLAs may cover more than one discharger, e.g., if the source is contained within a general permit.

The individual WLAs may take the form of uniform percentage reductions or individual mass based limitations for dischargers where it can be shown that this solution meets WQSs and does not result in localized impairments. These individual WLAs may be adjusted during the NPDES permitting process. If the WLAs are adjusted, the individual effluent limits for each permit issued to a discharger on the impaired water must be consistent with the assumptions and requirements of the adjusted WLAs in the TMDL. If the WLAs are not adjusted, effluent limits contained in the permit must be consistent with the individual WLAs specified in the TMDL. If a draft permit provides for a higher load for a discharger than the corresponding individual WLA in the TMDL, the State/Tribe must demonstrate that the total WLA in the TMDL will be achieved through reductions in the remaining individual WLAs and that localized impairments will not result. All permitees should be notified of any deviations from the initial individual WLAs contained in the TMDL. EPA does not require the establishment of a new TMDL to reflect these revised allocations as long as the total WLA, as expressed in the TMDL, remains the same or decreases, and there is no reallocation between the total WLA and the total LA.

Comment:
The Waste Load Allocation is 240.9 pounds/day in Table 17 below, taken from the TMDL submittal. Individual wasteloads from Appendix A of the TMDL submittal are shown in Tables A.1, A.2, A.3, and A.4 below. Tables 18 and 19 are at the end of this document and show the waste load allocations by state.

Table 17. Lake St. Croix TMDL Phosphorus Allocations - Basin-wide

Component	Existing (1990s) (metric tons/yr)	TMDL (metric tons/yr)	Existing (1990s) (pounds/day)	TMDL (pounds/day)
Wasteloads (WLAs)	**61.975**	**39.924**	**374.1**	**240.9**
MS4 Permitees	8.743	4.688	52.8	28.3
Wastewater Facilities	51.914	33.994	313.3	205.2
General Permits - WI	1.000	1.000	6.0	6.0
Construction runoff - MN	0.159	0.121	1.0	0.7
Industrial runoff - MN	0.159	0.121	1.0	0.7

MS4 Permittees: Municipalities with MS4 permits are identified in Appendix A of the TMDL but have aggregate values as shown above. Wisconsin MS4 Permittees (WI-S050075) are: River Falls; University of Wisconsin, River Falls; Hudson (anticipated); and, North Hudson (anticipated).

Minnesota MS4 Permittees (MNR040000) are:

Century College	MS400171
Cottage Grove	MS400082
East Bethel	MS400087
Forest Lake	MS400262
Grant	MS400091
Hugo	MS400094
Lake Elmo	MS400098
Mahtomedi	MS400031
Maplewood	MS400032
North Branch	MS400260
North Saint Paul	MS400041
Oakdale	MS400042
Pine Springs	MS400044
Stillwater	MS400259
Valley Branch Watershed District	MS400217
West Lakeland	MS400162
White Bear Lake	MS400060
Woodbury	MS400128
MNDOT Metro District	MS400170
Ramsey County	MS400191
Washington County	MS400160

Wastewater Treatment Facilities: Facilities were separated according to their magnitude of loading or facility size, to determine whether they needed individual or aggregate wasteloads. The larger facilities were given more restrictive allocations because they can more effectively remove phosphorus, and are often located in close proximity to the lake. They were also

categorized by type (industrial or municipal)[1], and size (small, medium, or large). Overall, individual WLAs account for 84% of the TMDL's WLA. Aggregate WLA are given to smaller facilities based on their low volume, low concentration, or low loads of phosphorus. These point sources, which account for 13% of the WLA, must comply with the aggregate effluent limitations, and remain under the aggregate cap. Each of the facilities also has an individual WLA. Wisconsin general permits are issued for locations with more intermittent flow such as cooling water, projects of short duration, or discharges to groundwater, and account for the remaining 3% of the WLA. Tables A.1 and A.3 below are from the TMDL and show the individual allocations by permitted facility and state.

Table A.1. Minnesota Wastewater WLAs

Facility	Permit Number	Facility Category	Concentration Assumption (mg/L)	Design Flow (mgd)	WLA (kg/yr)	WLA (lb/day)
St. Croix Valley WWTP	MN0029998	LM	0.6	5.800	4,808	29.0
Chisago Lakes	MN0055808	LM	0.6	2.460	2,039	12.3
Xcel Alan S. King Power Plant	MN0000825	I3	Other	331.20	1,300	7.8
North Branch WWTP	MN0024350	MM	1.0	0.812	1,122	6.8
Mora WWTP	MN0021156	MM	1.0	0.800	1,105	6.7
Pine City WWTP	MN0021784	MM	1.0	0.750	1,036	6.3
Hinckley WWTP	MN0023701	MM	1.0	0.682	942	5.7
Moose Lake WWTP	MN0020699	MM	1.0	0.495	684	4.1
Aitkin Cromwell Agri-Peat	MN0055662	I1	0.1	4.300	594	3.6
Shafer WWTP	MN0030848	MM	1.0	0.400	553	3.3
Rush City WWTP	MN0021342	MM	1.0	0.400	552	3.3
Sandstone WWTP	MN0056910	MM	1.0	0.383	529	3.2
Finlayson WWTP	MN0023418	MM	1.0	0.300	414	2.5
Ogilvie WWTP	MN0021997	MM	1.0	0.230	318	1.9
Isle WWTP	MN0023809	MM	1.0	0.200	276	1.7
Linwood Terrace - Iacarella	MN0054372	SM3	1.0	0.167	231	1.4
Cimarron Park WWTF	MN0050636	SM3	1.0	0.120	166	1.0
Harris WWTP	MN0050130	SM3	Load Limit	0.121	164	1.0
Askov WWTP	MN0022616	SM3	Load Limit	0.050	128	0.8
Willow River WWTP	MNG580054	SM3	Load Limit	0.044	122	0.7
		Total		**349.714**	**17,083**	**103.1**

Table A.3. Wisconsin Wastewater WLAs

Facility	Permit Number	Facility Classification	Concentration Assumption (mg/L)	Design Flow (mgd)	WLA (kg/yr)	WLA (lb/day)
Hudson WWTF	24279	LM	0.6	3.250	2,694	16.3
River Falls WWTP	29394	LM	0.6	3.170	2,628	15.9
New Richmond WWTF	21245	LM	0.6	1.730	1,434	8.7
Osceola, Village of	25020	MM	1.0	0.750	1,036	6.3
Amery, City of	20125	MM	1.0	0.535	739	4.5
St. Croix Falls, City of	20796	MM	1.0	0.496	685	4.1
Hammond	24171	MM	1.0	0.450	622	3.8
Clear Lake, Village of	23639	MM	1.0	0.404	558	3.4
Grantsburg, Village of	60429	MM	1.0	0.380	525	3.2
Somerset WWTF	30252	MM	1.0	0.375	518	3.1
Luck, Village of	21482	MM	1.0	0.364	503	3.0
Burnett Dairy Cooperative	39039	I2	1.0	0.250	345	2.1
		Total		**12.154**	**12,287**	**74.4**

[1] Minnesota and Wisconsin categorized industrial and municipal point sources together as wastewater facilities in this TMDL

Aggregate Implementation of Selected Wastewater Wasteload Allocations: These smaller locations are categorized as fish hatchery (H), industrial – low concentration (Il), municipal controlled discharge and design flow < 0.2 mgd (SM1), small municipal continuous discharge and design flow < 0.2 mgd (SM2), and Wisconsin General Permits (WGP). In Tables A.2 and A.4 below, it should be noted that many of the WLA are not representative of an annual load divided by 365 days to yield a daily value, but represent an intermittent daily effluent discharge that is more characteristic of the site.

Table A.2. Minnesota Wastewater Facilities Eligible for Aggregate NPDES Load Cap

Facility	Permit Number	Facility Category	Concentration Assumption (mg/L)	Design Flow (mgd)	WLA (kg/yr)	WLA (lb/day)
Barnum WWTF	MNG580142	SM1	2.0	0.146	402	18.8*
Taylors Falls	MN0053309	SM1	2.0	0.141	390	19.0*
Wahkon WWTP	MNG580051	SM1	2.0	0.121	334	16.0*
Grasston WWTF	MNG580052	SM1	2.0	0.038	105	6.5*
Anderson Corp	MN0001724	I1	0.1	1.500	104	0.6
Kettle River WWTF	MNG580183	SM1	2.0	0.035	97	4.8*
Shorewood Park	MN0051390	SM1	2.0	0.015	41	3.3*
		Total		**1.996**	**1,473**	**8.8**

*Daily wasteload allocations for Minnesota facilities in the SM1 category are calculated from the 2 mg/L concentration assumption and the maximum permitted effluent flow rate of 6"/day over the area of the facility's discharging cell(s). These controlled discharge facilities are designed to store 180 days worth of influent flow and to discharge during spring and fall periods of relatively high stream flow and/or low receiving water temperature. Since these facilities discharge intermittently, their daily wasteload allocations do not represent their annual wasteload allocations divided by the days in a year. Rather they reflect the permitted daily effluent loads as described above. Based on these daily allocations, the median number of days per year these facilities may discharge (annual WLA ÷ daily WLA) is 45. For consistency with all other TMDL loads, however, the aggregate daily *subtotal* in the table simply equals the aggregate annual load subtotal divided by 365.25 days.

Table A.4. Wisconsin Wastewater Facilities Eligible for Aggregate WPDES Load Cap

Facility	Permit Number	Facility Classification	Concentration Assumption (mg/L)	Design Flow (mgd)	WLA (kg/yr)	WLA (lb/day)
Frederic	29254	SM2	3.5	0.185	895	5.4
Star Prairie WWTF	60984	SM2	3.5	0.154	745	4.5
T. Thompson Hatchery	49191	H	0.1	2.208	305	1.8
Deer Park WWTF	25356	SM2	3.5	0.051	247	1.5
WI DNR Osceola Fish Hatchery	4197	H	0.1	1.770	245	1.5
Clayton, Village of	36706	SM1	2.0	0.087	240	8.7*
Webster, Village of	28843	SM1	2.0	0.085	235	8.5*
Amani Sanitary District	31861	SM1	2.0	0.032	88	3.2*
Advanced Food Products	39781	I1	0.1	0.401	55	0.3
W DNR St. Croix Falls Hatchery	4201	H	0.1	0.344	48	0.3
Lakeside Foods, INC.	2836	I1	0.1	0.316	44	0.3
Emerald Dairy	59315	I2	Load estimate		4	0.02
		Total		**5.633**	**3,151**	**18.9**

*Daily wasteload allocations for Wisconsin facilities in the SM1 category are calculated from the 2 mg/L concentration assumption and the maximum permitted effluent flow rate of 6 times the design flow. These controlled discharge facilities are designed to discharge the annual influent flow volume during 60 days of relatively high stream flow and/or low receiving water temperature in the spring and fall of the year. Since these facilities discharge intermittently, their daily wasteload allocations do not represent their annual wasteload allocations divided by the days in a year. Rather they reflect the permitted daily effluent loads as described above. Based on these daily allocations, the median number of days per year these facilities may discharge (annual WLA ÷ daily WLA) is 61. For consistency with all other TMDL loads, however, the aggregate daily *subtotal* in the table simply equals the aggregate annual load subtotal divided by 365.25 days.

MS4 Allocations – Land use/land cover data from 1992 were used to develop the MS4 allocations (Appendix C of the TMDL). MS4s were given an aggregate WLA in Minnesota and individual WLA in Wisconsin. There are four Wisconsin MS4s, two existing communities and two more anticipated due to future growth in the areas of Hudson and North Hudson. Minnesota has 21 MS4s in its portion of the watershed. As discussed in Section 4 above, the loads for the MS4 dischargers are based upon the phosphorus export coefficient for the urban land use. The initial (1992) export coefficient was reduced until the overall MS4 load allocation was achieved.

CAFO Allocations – There is only one CAFO in Minnesota, the Luoma Egg Ranch, Inc. (MN0056090), and Wisconsin has nine CAFOs. Almost all CAFOs have a zero allocation, except Emerald Dairy in Wisconsin, which has a small allocation from a permitted discharge (Table A.4 above).

Wisconsin Permit CAFO #	
Arcand Poultry Farm, Inc.	0059366
Bomaz Farms	0064505
Emerald Dairy, LLC	0059315
Jennie-O Turkey Store	0062049
Legacy Farms, LLC	0063029
Minglewood, Inc.	0059358
Owens Farms Inc.	0063363
Schottler Dairy Inc.	0058289
Ulrich Farms Inc.	0058939

Construction/Industrial Stormwater Allocations - Both MPCA and WDNR noted there are limited data on the numbers and impacts from construction stormwater activities (Section 5.4 of the TMDL). MPCA estimated the number of construction projects and the areal extent of each project. They determined that 0.1% of the total run-off load is attributed to construction sites, and therefore the resulting WLA is 0.121 metric tons/year (0.7 pounds/day). MPCA assigned a WLA for industrial stormwater as 0.121 metric tons/year (0.7 pounds/day). WDNR did not have the data available to calculate a WLA for industrial or construction facilities, so a load of 6.0 pounds/day was assigned to all general permit categories in Wisconsin.

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

6. Margin of Safety (MOS)

The statute and regulations require that a TMDL include a margin of safety (MOS) to account for any lack of knowledge concerning the relationship between load and wasteload allocations and water quality (CWA §303(d)(1)(C), 40 C.F.R. §130.7(c)(1)). EPA's 1991 TMDL Guidance explains that the MOS may be implicit, i.e., incorporated into the TMDL through conservative assumptions in the analysis, or explicit, i.e., expressed in the TMDL as loadings set aside for the MOS. If the MOS is implicit, the conservative assumptions in the analysis that account for the

MOS must be described. If the MOS is explicit, the loading set aside for the MOS must be identified.

Comment:
The TMDL has an implicit and explicit MOS. Section 5.3 of the TMDL states that an explicit MOS of 5% was used for the TMDL. MPCA and WDNR believe this is a sufficient MOS because of the extensive data and analysis that was performed to determine the phosphorus target. A detailed analysis of the paleo-cores and historical loading rates into the lake was performed, and numerous recent studies were reviewed to determine the phosphorus criteria. The historic loading and core analyses are consistent with using the more stringent Minnesota standard. Because of these efforts, MPCA and WDNR believe that the uncertainty regarding attainment of the designated use is lessened, and a larger MOS is not needed.

The implicit MOS is provided by the conservative assumption that the internal loading in Lake St. Croix will remain constant. The allocations in the TMDL were determined assuming a constant internal load impact in the lake; however, recent studies show that internal load impacts on water quality are reduced as external loads into the lake are reduced. This assumption serves to overestimate the phosphorus reductions needed to achieve the water quality standards in the lake. Tables 18 and 19 at the end of this document show the margin of safety values allocated by state.

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

7. Seasonal Variation

The statute and regulations require that a TMDL be established with consideration of seasonal variations. The TMDL must describe the method chosen for including seasonal variations. (CWA §303(d)(1)(C), 40 C.F.R. §130.7(c)(1)).

Comment:
Section 5.5 of the TMDL states that seasonal variation is considered because the goal for total phosphorus uses the growing season mean concentration, when the greatest amount of loading occurs from June through September. EPA considers this approach to be protective throughout all seasons.

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

8. Reasonable Assurances

When a TMDL is developed for waters impaired by point sources only, the issuance of a National Pollutant Discharge Elimination System (NPDES) permit(s) provides the reasonable assurance that the wasteload allocations contained in the TMDL will be achieved. This is because 40 C.F.R.

122.44(d)(1)(vii)(B) requires that effluent limits in permits be consistent with "the assumptions and requirements of any available wasteload allocation" in an approved TMDL.

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

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

Comment:
Section 8 of the TMDL submittal states that there is reasonable assurance that the TMDL will be implemented in both Minnesota and Wisconsin, through many funding mechanisms and citizens interested in water quality in their watershed.

In Minnesota, future point source limits will be consistent with the TMDL, and ensure the antidegradation or outstanding waters regulations are met. The Clean Water Partnership provides grants and loans; the Board of Water and Soil Resources leads nonpoint reduction activities; and the CWA Section 319 funding will provide nonpoint source implementation funding. These activities are developed to stop active erosion; the conceptual designs have been approved, and are in the process of being implemented.

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)

In Wisconsin, the TMDL will have reasonable assurance of being implemented because the implementation plan will be an amendment to the Area-wide Water Quality Management Plan for the St. Croix River Basin pursuant to chapter NR121, Wis. Adm. Code, and will provide the basis for CWA Section 319 funding. Future point source discharges will be consistent with the TMDL. In addition to 319 funding, Wisconsin DNR will join with the Department of Agriculture, Trade, and Consumer Protection (DATCP) to coordinate implementation of nonpoint source programs. There are also performance standards and prohibitions established in NR 151, and specific farm conservation practices to implement the performance standards via Chapter ATCP 50, Wis. Adm. Code. Further, all farms are required to implement the performance standards if offered cost-sharing. Under these standards, cropped fields must meet the tolerable soil erosion rate; manure storage facilities must be constructed, maintained or abandoned according to accepted standards; clean water must be diverted away from feedlots and manure storage; and, there must be nutrient management plans. Prohibitions include no overflow of manure storage facilities, no unconfined manure piles, no direct runoff from feedlots or stored manure into state waters, and no unlimited livestock access to waters so as to maintain sod cover. Financial support includes:

- The Targeted Runoff Management (TRM) Grant Program,
- The Notice of Discharge (NOD) Grant Program,
- The Urban Nonpoint Source & Storm Water Management Grant Program, and
- The River Planning & Protection Grant Program.

The Farmland Preservation Program is administered by DATCP which requires participating farmers to meet the state performance standards to be eligible for tax credits. Currently, in the state of Wisconsin about 17,000 farms participate, and the St. Croix watershed counties have a 6.5% to 22% participation rate. DATCP is also very active in conservation and protection practices and requires counties to develop Land and Water Resource Management (LWRM) Plans to identify conservation needs, with the goal of preventing NPS pollution through land and water conservation. These actions include establishing inventories of water quality and soil erosion, regulations, goals, indentifying problems and strategies to address problems, enforcement procedures, and workplans.

EPA finds that this criterion has been adequately addressed.

9. Monitoring Plan to Track TMDL Effectiveness

EPA's 1991 document, *Guidance for Water Quality-Based Decisions: The TMDL Process* (EPA 440/4-91-001), recommends a monitoring plan to track the effectiveness of a TMDL, particularly when a TMDL involves both point and nonpoint sources, and the WLA is based on an assumption that nonpoint source load reductions will occur. Such a TMDL should provide

assurances that nonpoint source controls will achieve expected load reductions and, such TMDL should include a monitoring plan that describes the additional data to be collected to determine if the load reductions provided for in the TMDL are occurring and leading to attainment of water quality standards.

Comment:
Section 7 of the TMDL provides a detailed monitoring strategy and outlines the steps to be used in the strategy. Sections 7.1 through 7.4 describe the extensive monitoring plans to enhance understanding of the processes taking place in the watershed and the waterbody itself, to establish the effectiveness of BMPs, and to inform future planning. Tasks will include monitoring the mainstem and selected tributaries to the St. Croix River, algal response, and BMP effectiveness. Monitoring will determine subwatershed load distribution, tributary loading during spring runoff, sources via sediment fingerprinting, and sediment phosphorus composition to better quantify internal lake phosphorus loading.

EPA finds that this criterion has been adequately addressed.

10. Implementation

EPA policy encourages Regions to work in partnership with States/Tribes to achieve nonpoint source load allocations established for 303(d)-listed waters impaired by nonpoint sources. Regions may assist States/Tribes in developing implementation plans that include reasonable assurances that nonpoint source LAs established in TMDLs for waters impaired solely or primarily by nonpoint sources will in fact be achieved. In addition, EPA policy recognizes that other relevant watershed management processes may be used in the TMDL process. EPA is not required to and does not approve TMDL implementation plans.

Comment:
As stated in the previous section on reasonable assurances, several agencies, strategies and funding efforts are already underway and will continue. Section 8.1 states that a phosphorus reduction implementation plan addressing both Minnesota and Wisconsin sources will be finalized within a year of EPA's approval of the TMDL. The implementation plan will identify specific BMPs for specific sources and have an adoption schedule.

The Environmental Quality Incentive Program (EQIP) is another option administered by the Natural Resources Conservation Service (NRCS) that gives farmers flat rate payments for installing and implementing runoff management practices such as terraces, waterways, diversions, and contour agricultural lands. The Conservation Reserve Program (CRP) is a voluntary program to assist farmers in planting vegetative covers that improve the quality of water, control soil erosion, and enhance wildlife habitat. In return, Farm Service Administration (FSA) provides rental and cost-share assistance. The Conservation Reserve Enhancement Program (CREP) provides annual rental payments; land adjacent to the stream must be planted and maintained in vegetative cover consisting of certain species to control erosion.

EPA finds that this criterion has been adequately addressed.

11. Public Participation

EPA policy is that there should be full and meaningful public participation in the TMDL development process. The TMDL regulations require that each State/Tribe must subject calculations to establish TMDLs to public review consistent with its own continuing planning process (40 C.F.R. §130.7(c)(1)(ii)). In guidance, EPA has explained that final TMDLs submitted to EPA for review and approval should describe the State's/Tribe's public participation process, including a summary of significant comments and the State's/Tribe's responses to those comments. When EPA establishes a TMDL, EPA regulations require EPA to publish a notice seeking public comment (40 C.F.R. §130.7(d)(2)).

Provision of inadequate public participation may be a basis for disapproving a TMDL. If EPA determines that a State/Tribe has not provided adequate public participation, EPA may defer its approval action until adequate public participation has been provided for, either by the State/Tribe or by EPA.

Comment:
The TMDL was public noticed from December 12, 2011 to January 11, 2012. Copies of the draft TMDL were made available upon request and on the Internet web site:
http://www.pca.state.mn.us/index.php/view-document.html?gid=15338

Past participation and communication is documented in Section 9 of the TMDL shown in Table 23 below. There were many meetings within the watershed with permitees, citizens, and stakeholder groups, occurring at different times and locations. The schedule enabled many persons to have access to the meetings in both states all across the watershed.

Table 23. Lake St. Croix Public Participation, 2009

Date	Location	Target Group	Participants
4/16/09	River Falls, WI	Annual Conference	126
6/10/09	Hinckley, MN	Community	12
6/16/09	Forest Lake, MN	Community	17
6/23/09	Frederic, WI	Community	13
6/30/09	Hudson, WI	Community	26
7/17/09	Pine City, MN	Ag/rural	21
7/29/09	Stillwater, MN	MS4 Permittees	12
7/30/09	North Branch, MN	WWTP	11
8/04/09	St. Croix Falls, WI	WWTP	25
8/17/09	Balsam Lake, WI	Ag/rural	27

Several entities and individuals provided comments to the MPCA and WDNR during the public comment period. The MPCA adequately responded to comments regarding use of data, aggregate allocations, phosphorus loading from nonpoint sources, BMPs, wastewater treatment, monitoring, and reasonable assurance. The WDNR adequately responded to comments regarding public support and citizen action for water quality improvement, wastewater treatment, stormwater management, agriculture, and implementation practices. Comments and responses are included

with the final TMDL submittal. The MPCA and WDNR also adequately addressed EPA comments.

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

12. Submittal Letter

A submittal letter should be included with the TMDL submittal, and should specify whether the TMDL is being submitted for a *technical review* or *final review and approval*. Each final TMDL submitted to EPA should be accompanied by a submittal letter that explicitly states that the submittal is a final TMDL submitted under Section 303(d) of the Clean Water Act for EPA review and approval. This clearly establishes the State's/Tribe's intent to submit, and EPA's duty to review, the TMDL under the statute. The submittal letter, whether for technical review or final review and approval, should contain such identifying information as the name and location of the waterbody, and the pollutant(s) of concern.

Comment:
The EPA received the final Lake St. Croix TMDL in June, 2012, accompanied by a submittal letter from both Minnesota (May 31, 2012) and Wisconsin (June 1, 2012). In the submittal letters, MPCA and WDNR stated that the submission includes the final TMDL for excess nutrients in Minnesota (ID 82-0001) and western Wisconsin (ID 2601500). The lake is impaired for aquatic recreational use by excess phosphorus.

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

13. Conclusion

After a full and complete review, EPA finds that the phosphorus TMDL for Lake St. Croix satisfies all of the elements of an approvable TMDL. This approval addresses 1 waterbody for excess nutrients apportioned for each state, for one Minnesota (ID 82-0001) TMDL and one Wisconsin (ID 2601500) TMDL, for a total of two TMDLs.

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.

EPA sent letters to the Mille Lacs Band of Ojibwe and the Fond du Lac Band of Chippewa in Minnesota, and the St. Croix Band of the Chippewa in Wisconsin. In the letters, EPA offered the Tribal representatives the opportunity to consult with the EPA regarding these TMDLs. EPA received no responses.

Table 18. Lake St. Croix TMDL Phosphorus Allocations - State of Minnesota

	Existing (1990s)	TMDL	Existing (1990s)	TMDL
Component	(metric tons/yr)		(lbs/day)	
Non-Regulated Loads (LA)	**155.212**	**120.606**	**936.8**	**727.9**
Watershed background	73.435	73.435	443.2	443.2
Watershed land use	78.009	43.403	470.9	262.0
Internal	3.548	3.548	21.4	21.4
Atmospheric	0.220	0.220	1.3	1.3
Wasteloads (WLA)	**34.260**	**22.793**	**206.9**	**137.5**
MS4s	7.446	3.995	45.0	24.1
Wastewater	26.496	18.556	159.9	112.0
General Permits - WI	--	--	--	--
Construction runoff - MN	0.159	0.121	1.0	0.7
Industrial runoff - MN	0.159	0.121	1.0	0.7
Reserve Capacity (RC)	--	**0.959**	--	**5.8**
RIB conversions - WI	--	--	--	--
Non-contributing - WI	--	--	--	--
ISTS conversions	--	0.959	--	5.8
Tribal Load (TL)	**0.132**	**0.132**	**0.8**	**0.8**
Watershed runoff	0.132	0.132	0.8	0.8
Wastewater	--	--	--	--
Margin of Safety (MOS)	--	**7.605**	--	**45.9**
Total Load	**189.604**	**152.095**	**1144.5**	**917.9**

Table 19. Lake St. Croix TMDL Phosphorus Allocations - State of Wisconsin

	Existing (1990s)	TMDL	Existing (1990s)	TMDL
Component	(metric tons/yr)		(pounds/day)	
Non-Regulated Loads (LA)	**242.157**	**175.998**	**1461.7**	**1062.4**
Watershed background	92.124	92.124	556.1	556.1
Watershed land use	146.265	80.106	882.8	483.5
Internal	3.547	3.547	21.4	21.4
Atmospheric	0.221	0.221	1.4	1.4
Wasteloads (WLA)	**27.715**	**17.131**	**167.2**	**103.4**
MS4 Permitees	1.297	0.693	7.8	4.2
Wastewater Facilities	25.418	15.438	153.4	93.2
General Permits - WI	1.000	1.000	6.0	6.0
Construction runoff - MN	--	--	--	--
Industrial runoff - MN	--	--	--	--
Reserve Capacity (RC)	--	**3.857**	--	**23.2**
RIB conversions - WI	--	1.929	--	11.6
Non-contributing - WI	--	0.396	--	2.4
ISTS conversions	--	1.532	--	9.2
Tribal Load (TL)	**0.524**	**0.524**	**3.2**	**3.2**
Watershed runoff	0.220	0.220	1.3	1.3
Wastewater	0.304	0.304	1.9	1.9
Margin of Safety (MOS)	--	**10.395**	--	**62.7**
Total Load	**270.396**	**207.905**	**1632.1**	**1254.9**