TMDL: Tainter Lake and Lake Menomin, Wisconsin
Date:

DECISION DOCUMENT FOR TAINTER LAKE AND LAKE MENOMIN, WI TMDLS

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

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

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

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

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

(1) the spatial extent of the watershed in which the impaired waterbody is located;
(2) the assumed distribution of land use in the watershed (e.g., urban, forested, agriculture);
(3) population characteristics, wildlife resources, and other relevant information affecting the characterization of the pollutant of concern and its allocation to sources;
(4) present and future growth trends, if taken into consideration in preparing the TMDL (e.g., the TMDL could include the design capacity of a wastewater treatment facility); and

(5) an explanation and analytical basis for expressing the TMDL through surrogate measures, if applicable. Surrogate measures are parameters such as percent fines and turbidity for sediment impairments; chlorophyll *a* and phosphorus loadings for excess algae; length of riparian buffer; or number of acres of best management practices.

Comment:
Tainter Lake and Lake Menomin are impaired waterbodies within the Red Cedar River Basin (RCR Basin) in west-central Wisconsin. The Wisconsin Department of Natural Resources (WDNR) placed the two waterbodies listed in Table 1 on the State of Wisconsin 303(d) Impaired Waters List. The waterbodies are listed as impaired due to eutrophication and elevated pH resulting from high phosphorus concentrations (Table 1 below). The waterbodies are commonly referred to as lakes, but are actually rivers under the WDNR rules (discussed in Section 2 of this Decision Document). To be consistent with the TMDL document submitted by WDNR, the waterbodies will be referred to as Tainter Lake and Lake Menomin.

Table 1. Impaired segments on Wisconsin's 2008 303(d) list that are included in the Tainter Lake and Lake Menomin TMDL.

Waterbody Name	County	WATERS ID	Impairments	Pollutants	Designated Use
Tainter Lake	Dunn	2068000	**Eutrophication**; elevated pH*	TP	Recreation
Lake Menomin	Dunn	2065900	**Eutrophication**; elevated pH*	TP	Recreation

*TP = Total phosphorus * - the pH impairment will be addressed at a future date*

Location Description/Spatial Extent:
The RCR Basin is 1700 square miles (mi^2) in size and is located in west-central Wisconsin. The basin includes the following counties: Washburn, Sawyer, Barron, Rusk, Chippewa, St. Croix, and Dunn. The RCR Basin includes a small portion of the Lac Courte Oreilles Band of Ojibwe Tribal Lands, covering approximately 250 acres in the furthest upstream portion of the basin. This decision excludes the very small portion of the Lac Courte Oreilles Band of Ojibwe Tribal Lands, which is not subject to WDNR's TMDL program.

The RCR originates from Long Lake and Lake Chetac and drains south and eventually enters Tainter Lake. Several smaller tributaries drain into Tainter Lake, the most significant is Hay River. Tainter Lake is a 1700 acre impoundment of the river, with a dam (the Cedar Falls Dam) at the downstream end of the impoundment. The dam provides limited water storage, and operates as a "run of the river" dam, raising water levels only 0.5 feet. The lake has a mean depth of 13 feet, and a retention time of 7 days (Page 2 of the TMDL).

Outflow from Tainter Lake and Cedar Falls Dam flows south approximately 5 miles into Lake Menomin. Lake Menomin is a 1400 acre impoundment of the RCR, with a mean depth of 7.5 feet and a residence time of 5 days. A dam is located at the base of the lake, and is operated similarly to the Cedar Falls Dam. The lake is nearly surrounded by the City of Menomonie. Over 96% of the flow into Lake Menomin is from the RCR/Tainter Lake, with only a few small tributaries entering Lake Menomin. WDNR noted that the Wilson River discharges into Lake Menomin, but is located less than 200 feet upstream of the dam, and does not contribute to the impaired water quality in Lake Menomin.

Population and Future Growth:
Population in the watershed is fairly small; the City of Menomonie is the largest in the watershed with a population of 15,000. The towns of Rice Lake, Barron, Turtle Lake and Boyceville are also located in the watershed. A portion of the existing load for TP has been set aside for future growth of point sources. WDNR estimated the increase in loading for wastewater treatment plants based on areas in the watershed converting from septic systems to centralized waste treatment. WDNR determined a 2.28 lb/d reserve capacity for permitted facilities.

Two Municipal Separate Storm Sewer System (MS4) communities are present in the watershed, Menomonie and Rice Lake. WDNR based the wasteload allocations for these permittees on the 2025 land use found in the Menomonie and Rice Lake Urban Land Use planning documents.

Land Use:
Table 2 presents the land uses in RCR Basin. In 2006, approximately 45% of the basin consisted of agricultural land (including pasture), 40% consisted of forest, and 5.5% consisted of urban land. As discussed in Section 3 below, WDNR used model results from 1992 based upon 1990 land use data (Appendix H of the TMDL). In response to public comments, WDNR compared the 1990 land use data to the 2006 land use data. The only significant change in land use was the "urban" use. WDNR further reviewed the increase in "urban" land use, and determined that it was not due to a significant increase in urbanized land, but rather due to improved GIS resolution that allows roads to be identified as separate from the surrounding land use (Figures 1 and 2 of Appendix H of the TMDL). Therefore, the WDNR did not change inputs to the model.

Table 2. Land uses in RCR Basin

Land Use	% Land Use (1992)	% Land Use (2006)
Agriculture (includes pasture)	44.5	45.7
Urban	0.4	5.6
Forest	41.9	39.1
Open Water	3.3	3.4
Wetland/shrubland	8.1	6.2
Barren	1.7	0

Problem Identification/Pollutant of Concern: WDNR noted that Tainter Lake and Lake Menomin have had nuisance algal blooms and poor water quality for many years. This has led to a poor fish and macroinvertebrate community and reduced recreational use. WDNR determined that TP was the pollutant of concern which must be addressed to mitigate these impairments. Reduction of the TP loads is expected to improve water quality and return the waterbodies to the appropriate designated uses.

WDNR conducted a study of RCR and Tainter Lake in 1989-1990. Sampling results showed very high levels of TP in the lake, and the trophic status was hypereutrophic (highly enriched in nutrients) (Page 5 of the TMDL). Sampling in 1996 for Lake Menomin showed similar results. A USGS gage located on the Red Cedar River just downstream of Lake Menomin indicates that TP has been elevated in the watershed for many years (Figure 9 of the TMDL).

Surrogate measures: The WDNR determined that phosphorus is the pollutant that must be addressed to reduce algal blooms and eutrophication to attain the recreational use listed in Table 1 above. Phosphorus primarily enters the stream bound to soil particles that transport it during runoff. Overgrazed pastures adjacent to the stream channel and nutrient rich manure spread within close proximity (e.g. 30 feet) of the stream can also contribute phosphorus loads to the waterbodies. The phosphorus loads cause eutrophication of streams and reservoirs that is characterized by excessive plant growth and dense algal growth. There are higher fluctuations of DO levels due to algal oxygen production during photosynthesis, consumption of oxygen during respiration at night, and bacterial consumption of oxygen in the decay process of dead algae and plant material.

Source identification: WDNR identified numerous sources of TP in the basin. Point sources of TP in the basin include fourteen municipal wastewater treatment facilities (WWTF) and five industrial facilities. Phosphorus is a component of the effluent discharged from municipal WWTFs, and may be a component in industrial discharge. Stormwater discharge from MS4s can contain phosphorus from erosion of urban lands from sources such as lawn fertilizer, pet and animal waste, and other organic material. WDNR identified seven Concentrated Animal Feeding Operations (CAFOs) in the RCR Basin. The animal handling facilities at these CAFOs are not authorized to discharge pollutants under normal operations. Land application of manure from CAFOs is not included in the assumption of zero discharge. Rather, WDNR accounted for that loading of phosphorus in its calculation of the nonpoint source loads in the RCR Basin. A variety of sites regulated under general permits (i.e., construction, cooling water) are also potential sources of phosphorus. Appendix C of the TMDL lists the General Permits that apply to the RCR Basin.

WDNR identified nonpoint sources as the most significant contributors of phosphorus (Page 8 of the TMDL). Runoff from agricultural lands can contribute phosphorus, either from the land application of manure or chemical fertilizers. Agricultural tiles can exacerbate this situation as water enters the tiles and is channeled directly to waterbodies. Soils that are high in phosphorus (either naturally or from human activities) can erode and enter waterbodies. Once in the system, the phosphorus can dissolve into the water, and be available for use. Runoff from pasture lands near streams can contribute phosphorus. Urban stormwater runoff that is not regulated under a MS4 permit can also contain phosphorus from fertilizers and animal waste. Wildlife (geese, etc.) and runoff from forest lands are also natural background sources of phosphorus.

The potential nonpoint sources to the Tainter Lake and Lake Menomin watershed are:
<u>Atmospheric deposition:</u> Phosphorus may be added via particulate deposition. Particles from the atmosphere may fall onto lake surfaces or other surfaces within the Tainter Lake and Lake Menomin watershed. Phosphorus can be bound to these particles which may add to the phosphorus inputs to surface water environments.

<u>Agricultural sources (pasture and open lands):</u> Phosphorus may be added via surface runoff from upland areas which are being used for Conservation Reserve Program (CRP) lands, grasslands, and agricultural lands used for growing hay. Stormwater runoff may contribute nutrients to surface waters from livestock manure, fertilizers, vegetation and erodible soils.

Livestock sources (animal feeding operations): Animal feeding operations (AFOs) which are not large enough to need a permit, may nevertheless transport phosphorus to surface waters during storm events (via stormwater runoff). AFOs may transport phosphorus laden materials from feeding, holding, and manure storage areas to surface waters.

Urban/residential sources: Nutrients may be added via runoff from homes near Tainter Lake and Lake Menomin. Runoff from residential properties can include phosphorus derived from fertilizers, leaf and grass litter, pet wastes, and other sources of anthropogenic derived nutrients.

EPA finds that the TMDL Report submitted by 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 uses 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:
Pages 10-13 of the TMDL Report describes designated uses, narrative criteria, and numeric criteria applicable to this basin. The goal of the Tainter Lake and Lake Menomin TMDLs is to reduce phosphorus loads to a level sufficient to meet the numeric and narrative water quality standard (WQS) for phosphorus and attain the designated uses.

Narrative Standards for TP and Designated Uses: WDNR has determined that Tainter Lake and Lake Menomin are impaired due to excessive algal blooms caused by excess phosphorus that interfere with the recreational use of the waterbodies. WDNR identified the narrative standard in Wis. Admin. Code NR § 102.04 (1) as the applicable standard to address phosphorus. This provision states "Substances that will cause objectionable deposits on the shore or in the bed of a body of water, shall not be present in such amounts as to interfere with public rights in waters of the state." Wis. Admin. Code NR § 102.04(1)(a). WDNR explained that "Algal blooms associated with excessive phosphorus loading are also considered 'objectionable deposits,' and are characterized as 'floating debris, scum and material,' which produce 'color, odor, taste, or

unsightliness' that interferes with both the fish and aquatic life and recreational uses of the water body." (Page 10 of the TMDL). WDNR has determined that Tainter Lake and Lake Menomin are impaired for recreational use due to excessive algal blooms due to high levels of phosphorus.

Numeric Standards for TP: TP contributes to algal growth and blooms which reduce light penetration. High levels of TP can also cause low levels of dissolved oxygen by stimulating the growth and decay of algae. State regulations define the applicable numeric water quality standard for phosphorus in the RCR Basin (Wis. Admin. Code NR §§ 102.06(1) and 102.06(3)):

> (1) GENERAL. This section identifies the water quality criteria for total phosphorus that shall be met in surface waters.
>
> (3) STREAMS AND RIVERS. To protect the fish and aquatic life uses established in s. NR102.04 (3) on rivers and streams that generally exhibit unidirectional flow, total phosphorus criteria are established as follows:
>
> (a) A total phosphorus criterion of 100 µg/L is established for the following rivers . . .
>
> 34. Red Cedar River from confluence with Brill River to Chippewa River, excluding Rice Lake, Tainter Lake, and Lake Menomin.

Under Wis. Wis. Admin. Code NR §§ 102.06(4)(a), the applicable TP criteria for an unstratified reservoir is 40 µg/L. WDNR determined that Tainter Lake and Lake Menomin do not meet the definition of "Reservoir" under Wis. Admin. Code NR §§ 102.06(2)(f), which states:

> (f) "Reservoir" means a waterbody with a constructed outlet structure intended to impound water and raise the depth of the water by more than two times relative to the conditions prior to construction of the dam, and that has a mean water residence time of 14 days or more under summer mean flow conditions using information collected over or derived for a 30 year period.

WDNR analyzed flow data for the basin, and using the process in Wis. Admin. Code NR §§ 102.06(2)(f), determined the retention time for Tainter Lake to be 7.5 days and to be 5.5 days for Lake Menomin (Pages 10 and 45 of the TMDL). Under Wisconsin rules the two waterbodies are classified as "impoundments" pursuant to Wis. Admin. Code NR §§ 102.06(4)(c), which states:

> (c) Waters impounded on rivers or streams that don't meet the definition of reservoir in this section shall meet the river and stream criterion in sub. (3) that applies to the primary stream or river entering the impounded water.

Based upon the regulatory provisions above, the water quality criterion for Tainter Lake and Lake Menomin is 100 µg/L. However, when WDNR initially modeled the response of Tainter Lake and Lake Menomin using the 100 µg/L criteria, the results indicated that the chlorophyll-a levels would be approximately 55 µg/L. Chlorophyll-a is a form of chlorophyll used by plants for photosynthesis; measuring chlorophyll-a generally measures the amount of living algae in the water. At a chlorophyll level of 55 µg/L and a TP level of 100 µg/L, WDNR determined that the

waterbodies would still be hypereutrophic and experience algal blooms 75% of the time and still be impaired for recreational use (Page 10 of the TMDL).

Numeric Targets for TP: To further refine the TMDL target, WDNR analyzed data from numerous other similar waterbodies in the state (Appendix B of the TMDL). WDNR noted that if Tainter Lake and Lake Menomin had sufficient retention time to be classified as lakes, the applicable phosphorus criteria would then be 40 µg/L. WDNR investigated what the chlorophyll-a level would be if the two waterbodies attained a TP value of 40 µg/L.

WDNR identified waterbodies in western Wisconsin that had roughly similar hydrology, similar size and were from a similar ecological region. Wisconsin identified a universe of 145 impoundments, which were then further refined based upon the availability of paired TP and chlorophyll-a data. Ultimately, the analysis used a sample set of 158 samples from 54 sites on 31 flowages (Appendix B of the TMDL). These results were plotted to determine the relationship between TP and chlorophyll-a (Figure B-1 of Appendix B of the TMDL). WDNR then performed a regression analysis (i.e., analyzing how chlorophyll-a changed as TP values changed), and determined that for lakes/impoundments similar to Tainter Lake and Lake Menomin, a summer growing season mean for TP of 40 µg/L would result in a chlorophyll-a range of 5-25 µg/L. In other words, a chlorophyll-a goal of 25 µg/L is consistent with impoundments that are attaining the TP water quality criteria and designated uses. Details of the target process are in Appendix B of the TMDL.

As described in further detail in Section 3 of this Decision Document, WDNR used the BATHTUB water quality model to determine the TP values that would correspond to a chlorophyll-a target of 25 µg/L. The results of the model demonstrate that a TP target of 59 µg/L in Tainter Lake will result in a chlorophyll-a target of 25 µg/L (Table 3 below). WDNR noted that the waterbodies will still be considered "eutrophic", but the algal blooms will be significantly reduced and result in attainment of the recreational designated use.

EPA concurs with the State's approach in determining the TP targets. EPA agrees that the use of chlorophyll-a as an additional surrogate to further refine the State's narrative water quality standard for "objectionable deposits" and to allow for recreational uses of the RCR watershed is appropriate. The modeling process and information relied upon by the State in developing the targets has taken into account meaningful parameters and has adequately accounted for the assumptions made in data analysis to arrive at these targets. The reductions in TP will likely reduce the algal growth in the impoundments which would lead to significant reductions of nuisance algal blooms and improved recreational activities.

During the public comment period for the TMDL, questions were raised regarding the relationship between TP target levels and blue-green algae. Blue-green algae can pose risks to pets and recreational users of Tainter Lake and Lake Menomin, and can be a significant aesthetic problem. Neither the EPA nor the WDNR have specific water quality criteria for blue-green algae. Research on this issue is ongoing, and WDNR expects that the TMDL can be revised as new data are available or criteria are established.

Table 3. TMDL TP Targets

Tainter Lake	**1990**	**TMDL Targets**
Total Phosphorus (µg/L)	150	59
Chlorophyll-a (µg/L)	87	25
Lake Menomin	**1990**	**TMDL Targets**
Total Phosphorus (µg/L)	150	57
Chlorophyll-a (µg/L)	87	25

EPA finds that the TMDL Report submitted by 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 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.

Comment:
Loading Capacity Summary: The loading capacities for each impaired waterbody for TP are summarized below in Tables 4 and 5. A summary of the modeling methods used to develop the TMDL is presented below, followed by the details and rationale for loading capacity development.

Model Description: The BATHTUB model was utilized to link phosphorus loads with in-lake water quality and to calculate a loading capacity value for Tainter Lake and Lake Menomin (Page 12-13 of the TMDL; Schreiber, WDNR, 1992). BATHTUB is a steady-state annual or seasonal model that predicts a lake's growing season (May 1 – September 30) average surface

water quality. BATHTUB utilizes annual or seasonal time-scales which are appropriate because watershed TP loads are normally impacted by seasonal conditions.

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

The pollutant sources were identified and estimated based on water quality monitoring data, flow data and modeling efforts. The loading capacity of the lake was determined through the use of BATHTUB. The BATHTUB model initially determined the amount of TP entering Tainter Lake, and then was used to determine how the lake responded to changes in the TP loads. The model was reviewed in 1995 by William Walker, the developer of the BATHTUB model, to further refine the analysis. The result of this analysis demonstrated that chlorophyll-a levels in Tainter Lake are more sensitive to TP levels than previously thought (Memo from Ken Schrieber, WDNR, March, 1996). The revised model determined that the load capacity for the growing season was 75,000 lbs for the summer season, which is a 65% reduction in the 1990 load.

WDNR then used an additional model to further refine the annual loadings. The Simulator for Water Resources in Rural Basins (SWRRB – a precursor to the Soil and Water Assessment Tool (SWAT) model) developed by the U.S. Department of Agriculture's Agricultural Research Service was used to calculate simulated, predicted pollutant loadings primarily from agricultural/non-urbanized land uses. The SWRRB model simulates hydrology, sediment, and nutrient transport due to runoff in rural watersheds. The RCR basin was subdivided into 70 subwatersheds based upon drainage characteristics (Page 5 of the "Prediction of Suspended Solids and Total Phosphorus Yields in the Red Cedar River Drainage system, WDNR, 1999; hereinafter the "SWRRB Report"). The various land uses in the watershed (cropland, pasture, urban, etc.) were plotted and TP export coefficients (amount of TP washed off the land surface based upon land use type) were estimated based upon WDNR data. The TP loads from each land use were then routed to the streams and rivers in the watershed, and eventually into Tainter Lake.

WDNR utilized a variety of data sources for use in the SWRRB model. SWRRB model overview, inputs and methods, watershed and subwatershed delineations, calibration, parameter uncertainty analysis, and model results are found in the SWRRB report. The model used a 9 year averaging period to address seasonal and annual variations in precipitation to determine an annual average loading of 506,000 lbs. WDNR then applied the 65% reduction in seasonal load to the annual loading to determine the annual loading capacity of 177,000 lbs (Page 14 of the TMDL) .

WDNR subdivided the loading capacity among the WLA and LA components of the TMDL (Tables 4 and 5 below). The LA accounted for a majority of the loading capacity. These calculations were based on the critical condition, the summer growing season. TMDL allocations

assigned during the summer growing season will protect Tainter Lake and Lake Menomin during the most water quality limiting conditions of the year. The WDNR assumed that the loading capacities established by the TMDL will be protective of water quality during the remainder of the calendar year (October through April).

EPA noted during the review of the TMDL that the annual and daily loads for Tainter Lake contain a mathematical error. The Loading Capacity was calculated to be 486 lbs/day (177,000 lbs/yr), and the wasteload allocation was determined to be 55 lbs/day (20,100 lbs/yr). This results in a load allocation of 431 lbs/day (156,900 lbs/yr). This results in a 5 lbs/day (500 lbs/yr) difference, and does not significantly impact the TMDL.

For Lake Menomin, WDNR analyzed flow and monitoring records to determine the sources of TP to the lake (Appendix A of the TMDL). Almost all of the flow (and subsequent load) into Lake Menomin is from Tainter Lake, which is approximately 5 miles upstream. The only significant tributary to Lake Menomin is Wilson Creek, which enters Lake Menomin approximately 200 meters above the Menomonie Dam (the outfall of Lake Menomin). Because discharge at the dam is greater than the Wilson Creek flow, water from Wilson Creek is expected to immediately exit Lake Menomin, and have no impact on TP levels in the lake.

WDNR used BATHTUB to assess water quality impacts in Lake Menomin, and determine the impact that attaining the TMDL for Tainter Lake would have on Lake Menomin (Appendix A of the TMDL). Sampling data from 2002 and 2003 was utilized in the model, as well as flow and precipitation data, and outputs from the Tainter Lake BATHTUB model. Results of the model indicate that the reductions in Tainter Lake will strongly impact Lake Menomin (Page 33 of the TMDL). Attaining the TMDL in Tainter Lake will result in a 54% reduction in loadings to Lake Menomin, and together with load reductions in the City of Menomonie stormwater loads, will result in attaining a chlorophyll-a value of 22 µg/L, below the target of 25 µg/L. The TMDL summary for Lake Menomin is in Table 5 below.

During the development of the TMDL, comments were raised regarding the use of the 1992 BATHTUB model and 1999 SWRRB model being representative of current conditions. WDNR provided further analysis of the land use and phosphorus transport in the basin over time (Appendix H of the TMDL). The analysis noted that land use in the basin has changed only slightly from 1992 to 2006. The only significant change was in "developed" land, which changed from 0.4% in 1992 to 5.6% in 2006. WDNR compared the GIS maps for the two time periods, and noted that the actual developed land (cities/towns) changed slightly, but that the more recent GIS maps were better able to determine the roads in the watershed (Figures 1 and 2 of Appendix H of the TMDL). WDNR stated that these roads were present in 1992, but the technology was unable to identify them. However, the effect of runoff from these roads would still have been captured in the 1992 model. Therefore, WDNR believes the increase in urban land use is not as significant as implied in the 2006 land use data.

In addition to land use, WDNR also reviewed land practices in the watershed. Tillage practices, cropping practices, and fertilizer and manure use were reviewed. The results show that while the practices have changed over time, there is no overall trend. Phosphorus generated from manure has dropped over time and has been more regulated, suggesting less phosphorus entering the system from that source. Row crop acreage has increased and forage crops have decreased,

suggesting more runoff from soils. Soil phosphorus levels and soil loss rates have remained fairly constant. WDNR also reviewed the TP levels below Lake Menomin, and determined that these levels have risen slightly from 1995-2011. The overall results of the study by WDNR indicate that the models remain representative of the watershed.

EPA supports the data analysis and modeling approach utilized by WDNR in its calculation of wasteload allocations, load allocations and the margin of safety. Additionally, EPA concurs with the loading capacities calculated by the WDNR in the Tainter Lake and Lake Menomin TMDLs. Model selection and development are consistent with EPA guidance (Protocol for Developing Nutrient TMDLs, EPA, 1999; and Compendium of Tools for Watershed Assessment and TMDL Development, EPA, 1997) and the State has submitted sufficient documentation in the TMDL Report as discussed above, to demonstrate that the model is capable of reasonably simulating conditions in the watershed.

Table 4. TMDL for TP in Tainter Lake

Category	**Current TP Loading (lbs/yr)**	**TMDL (lbs/yr)**	**TMDL (lbs/day)**
Load Allocation	463,400	156,900*	**431***
Wasteload allocation	42,900	20,100	**55**
Total Loading Capacity	506,300	177,000	**486**

* - slightly revised from TMDL document

Table 5 TMDL for TP for Lake Menomin

Category	**Current TP Loading (lbs/yr)**	**TMDL (lbs/yr)**	**TMDL (lbs/day)**
Outflow from Tainter Lake	319,000	145,300	**398**
Load Allocation (direct watershed)	3500	2200	**6.2**
Wasteload allocation (MS4)	3500	2200	**6.1**
General WPDES Permits Wasteload allocation *		10	**0.028**
Total Loading Capacity	326,000	149,710	**411**

*Excluding CAFOs

Critical Conditions: Page 12 of the TMDL states that the critical conditions for TP occur during the summer months since elevated temperatures, flow, and sunlight conditions promote nuisance aquatic plant growth.

EPA finds the WDNR's approach for calculating the loading capacities to be reasonable and consistent with EPA guidance. EPA finds that the TMDL Report submitted by 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:
The TP load allocation (LA) for Tainter Lake is 156,900 lbs/yr (431 lbs/day), and for Lake Menomin is 147,500 lbs/yr (404.2 lbs/day). Tables 4 and 5 above shows the TP LAs and current loads for Tainter Lake and Lake Menomin.

WDNR calculated loadings for each sub-watershed using the SWRRB model. The SWRRB model generated loadings based upon land use in 1999 and utilized 4 separate land uses as discussed in Section 3 above. For Tainter Lake, the LA is an aggregated loading. WDNR did note, however, the 1999 SWRBB model indicated that 67% of the TP load into Tainter Lake was from cropland sources, and WDNR indicated in the TMDL (page 25 of the TMDL) that control of agricultural sources will be critical for the success of the TMDL. For Lake Menomin, the sampling data and model analysis determined that 95% of the loading for the lake comes from Tainter Lake. WDNR determined the LA for Lake Menomin assuming that Tainter Lake was meeting the TMDLs goals as well as accounting for the small portion of the watershed discharging to Lake Menomin.

EPA finds the WDNR's approach for calculating the loading allocations to be reasonable and consistent with EPA guidance. EPA finds that the TMDL Report submitted by 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 permittees should be notified of any deviations from the initial individual WLAs contained in the TMDL. EPA does not require the establishment of a new TMDL to reflect these revised allocations as long as the total WLA, as expressed in the TMDL, remains the same or decreases, and there is no reallocation between the total WLA and the total LA.

Comment:
The overall TP WLA for Tainter Lake is 20,100 lbs/yr (55.04 lbs/day). The overall TP WLA for Lake Menomin is 2210 lbs/yr (6.128 lbs/day). Table 6 below contains the individual TP WLAs for Tainter Lake. The process used to determine the WLAs is summarized below.

The WLAs for general NPDES permit holders and construction sites in both lakes were set equal to baseline loads. WDNR estimated the number of facilities covered under general industrial stormwater permits, and estimated the stormwater run-off loadings from these sites to be 4% of the loadings from the individually permitted point sources in the RCR Basin (Page 16 of the TMDL). WDNR did not further differentiate the numbers of facilities regulated under general permits; the types of general permits are listed in Appendix C of the TMDL. The individual point sources in the RCR Basin discharged an average of 12,536 lbs/year TP, and 4% of this load is 501 lbs. WDNR further refined this allocation based upon the watershed area ratio, with 98% of the watershed draining to Tainter Lake, and 2% draining to Lake Menomin (it should be noted that this differs slightly from the ratio discussed on Page 16 of the TMDL). This results in an overall WLA of 490 lbs/yr (1.34 lbs/day) of TP for general permits in Tainter Lake and 10 lbs/year (0.028 lbs/day) of TP for Lake Menomin.

WDNR set loads from municipal WWTFs and industrial dischargers equal to the dischargers' design flow and an effluent limit of 1 mg/L TP except for those noted in Table 6 below (Page 14 and Appendix E of the TMDL). This represents a reduction of 42% from current permitted loads for the current permitted total WLA. This overall WLA constitutes 11% of the total load entering Tainter Lake. WDNR set aside a reserve capacity of 831 lbs/year (2.28 lbs/day) of TP in anticipation of future surface water discharges when individual septic systems are connected to wastewater treatment facilities. For those facilities noted in Table 6 below, WDNR explained that these sites discharge limited amounts of low phosphorus-concentration wastewater and do not have TP effluent limits in their permits, and therefore there are limited data to calculate a WLA. WDNR estimated loads from the facilities, based upon the state's knowledge of the discharges. EPA agrees this is appropriate, given the small amount of loading from these facilities. EPA notes that the TMDL and WLAs can be revised using the reserve capacity if necessary as new data are gathered.

The only MS4 discharger in the Tainter Lake watershed is for the City of Rice Lake. The permit area covers 3800 acres based upon anticipated land use for 2025. The results from the City of Menomonie stormwater study (discussed below) determined a TP goal of 0.445 lbs/acre/year. Applying this export goal to the Rice Lake MS4 acreage results in a WLA of 1700 lbs/year (4.66 lbs/day) of TP.

Table 6. TP WLAs for Tainter Lake

Facility Name	Permit	TP (lbs/yr)	TP (lbs/day)
Almena	WI-0023183	435	1.19
Boyceville	WI-0060330	670	1.84
Chetek	WI-0021598	1,172	3.21
Colfax	WI-0023663	320	0.88
Crystal Lake SD	WI-0035114	37	0.10

Cumberland	WI-0020354	1218	3.34
Dallas	WI-0023698	231	0.63
Glenwood City	WI-0060381	798	2.19
Jennie O Turkey Store	WI-0070408	3,349	9.17
Lakeland SD #1	WI-0061387	46	0.13
Prairie Farm	WI-0025178	183	0.50
Rice Lake	WI-0021865	6,697	18.35
Ridgeland	WI-0021296	97	0.27
Turtle Lake	WI-0025631	1,662	4.55
Wheeler	WI-0060852	152	0.42
AB Mauri Food Inc.	WI-0044521	2.5	0.007*
Saputo Cheese-Almena	WI- 0050725	2.5	0.007*
Seneca Foods-Cumberland	WI-0052701	2.5	0.007*
Birchwood Mfg. Co.	WI-0042528	4.5	0.012*
Rice Lake MS4		1,700	4.66
All general industrial and non-MS4 stormwater permits		490	1.34
Individual permit reserve capacity		831	2.28
	TOTAL	**20,100**	**55.04**

* - based upon estimated discharge values

For Lake Menomin, the WLA (Table 5 above) represents the City of Menomonie MS4, as there are no individually permitted dischargers in the Lake Menomin watershed. Appendix D of the TMDL summarizes the City of Menomonie stormwater modeling project from 2008. The modeling project used WinSLAMM (Source Loading and Management Model for Windows)(for urban areas) and Snap-Plus (for agricultural areas) to model stormwater run-off based upon existing 1993 land use data and projected land use in 2025 (Nonpoint Source Phosphorus Load from the City of Menomonie, 2008). The modeling project utilized a phosphorus index (export coefficient) for phosphorus for various land uses, based upon the projected 2025 land use. The models assumed: 1) that all City of Menomonie land would be urban and not agricultural; and, 2) that BMP installation would result in significant reduction from the 1993 land use. The resulting load from the MS4 area was determined to be 2200 lbs/year of TP (6.1 lbs/day). Dividing this loading by the acres under the projected 2025 MS4 area (4974 acres) equals 0.445 lbs/acre/year.

There are 7 NPDES-regulated CAFOs in the RCR Basin. WDNR assumed that CAFOs covered under NPDES permits are in compliance with no-discharge permit requirements, and therefore assumed that loading from CAFOs is zero (0) (Page 16 of the TMDL). Land application of manure from CAFOs is not included in the assumption of zero discharge. Rather, WDNR accounted for that loading of phosphorus in its calculation of the nonpoint source loads in the RCR Basin.

Table 7. CAFOs in the Red Cedar River Watershed (WLA = 0)

CAFOs	Permit
Norswiss Farms INC	WI-0059340
Scheps Dairy INC	WI-0063690
Sugar Bol Farms	WI-0062995
Four Mile Creek Dairy	WI-0063321
Jennie O Turkey Store	WI-0062049
Knut Sons INC	WI-0049492
John and Mary Jane Higbie	WI-0063487

The State's modeling approach and assumptions made in determining wasteload allocations as described in the TMDL Report and related documents are consistent with EPA guidance. EPA finds that the TMDL Report submitted by 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:
WDNR explains that the TMDL includes an implicit margin of safety (MOS) based upon conservative assumptions in the modeling used to determine the allocations for TP (Page 17 of the TMDL). The first conservative assumption is an over-prediction of the growing season portion of the TP loading. The BATHTUB model and SWRRB model used to determine the seasonal loading were based upon a modeled response of the lakes to TP based on 1990 monitoring data. Following the process discussed above in Section 3, the load capacity for the lakes is based upon meeting a growing season load of 75,000 lbs (to achieve the 25 µg/L chlorophyll-a target). WDNR reviewed monitoring data from 1994-2009 to determine that approximately 40% of the phosphorus load enters the lake during the growing season. Multiplying the annual load capacity by 40% results in a growing season load of approximately 70,800 lbs of TP, which is below the modeled growing season target of 75, 000 lbs TP. This indicates the TMDL overestimates the TP that will actually enter the lake, and therefore overestimates the reductions needed to achieve the water quality targets. This MOS applies to both lakes as the flow and load into Lake Menomin is almost completely comprised of flow and load from Tainter Lake.

WDNR included an additional implicit MOS for Lake Menomin based on the response of Lake Menomin to phosphorus loads. Additional BATHTUB model work was done for Lake Menomin and revised in 2011. The additional analysis determined that attaining the TMDL loads in

Tainter Lake would result in a mean TP concentration of 22 µg/L in Lake Menomin, below the TMDL target of 25 µg/L.

EPA has reviewed the MOS and determined that it is consistent with EPA guidance and policy. The BATHTUB and SWRRB models slightly overestimated loads entering the waterbodies. EPA concurs with WDNR's rationale in applying and interpreting implicit MOS for the Tainter Lake and Lake Menomin TMDLs.

EPA finds that the TMDL Report submitted by 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:
TMDLs must consider temporal (e.g., seasonal or interannual) variations in discharge rates, receiving water flows, and designated use impacts. WDNR accounted for the seasonal variation in the TMDL by a variety of methods. First, daily precipitation and temperature data from two locations near the watershed were incorporated into the SWRRB model. These were used to develop a 30-year weather data set. This captures the seasonal variations in precipitation patterns that affect nonpoint source discharge rates (i.e., loading to the waterbodies). Second, the SWRRB model accounted for variations in tillage practices (spring plow, fall plow, etc.) in the model, to more closely match the effects of seasonal land use changes on loadings. Third, the TP target was specifically developed to address the water clarity and algal issues in Tainter Lake and Lake Menomin. As explained in the TMDL (Appendix B of the TMDL), the recreational use is impaired due to algal blooms in the summer. By targeting the specific season when recreational use is highest, the TP targets the seasonal impact on the recreational use.

EPA finds that the TMDL Report submitted by 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 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:
WDNR has planned activities to provide for reasonable assurances to implement the WLAs and LAs for the Tainter Lake and Lake Menomin TMDLs (Pages 18-26 of the TMDL). Reasonable assurance will be provided for individual permits by including limits that are consistent with the approved TMDL WLAs and may include adaptive management under Wis. Admin. Code NR § 217.06. WDNR explained that reasonable assurance will be provided for general permits by determining if additional requirements are needed to ensure that the permitted activity is consistent with TMDL goals.

In the TMDL Report, WDNR explains how the TMDL will be amended to the Areawide Water Quality Management Plan pursuant to Wis. Admin. Code NR § 121. WDNR is developing a detailed implementation plan that will provide specific management measures to control phosphorus loading in the watershed, focusing in particular on nonpoint source loads. WDNR has funded a position to begin the development of this implementation plan and to integrate it with the nine key elements of a Clean Water Act 319 watershed-based plan. A Planning Team began meeting in December 2010. WDNR noted that funding sources have been identified, and a grant application submitted by the Wisconsin Farmers Union is pending before the McKnight Foundation. Numerous partners are part of the implementation plan development, and a partial list was included on Page 21 of the TMDL.

The UW Extension has been involved in this effort for several years. The Extension hosts a website that contains numerous reports and public information regarding previous and future efforts for phosphorus controls in the Basin. The website is located at http://naturalresources.uwex.edu/redcedar/index.html

Wisconsin's Nonpoint Source (NPS) Program provides a variety of financial and technical programs that will ensure that the LAs will be addressed and have the opportunity to be implemented. Under WDNR's NPS Program, the following activities provide for reasonable assurance that nonpoint sources of pollution would be controlled and/or prevented: 1) Polluted runoff performance standards and prohibitions for agricultural and non-agricultural facilities and practices; and, 2) Pollution abatement by administering and providing cost-sharing grants to fund BMPs through various WDNR grant programs.

Wis. Admin. Code NR § 151 establishes numerous NPS runoff pollution controls and prohibitions. WDNR noted that these standards focus on agricultural and manure management efforts, and will be part of the effort to attaining WQSs. These efforts include tolerable soil erosion rates, manure storage requirements, clean water diversions, and nutrient management. The rule was revised in June 2010 to include additional requirements for NPS runoff.

The counties within the RCR Basin will develop Land and Water Resource Management (LWRM) Plans under the Department of Agriculture, Trade, and Consumer Protection's (DATCP) Soil and Water Resource Management Program. The LWRM Plans include activities that advance land and water conservation and prevent NPS pollution. Upon approval of the LWRM Plan by DATCP, the county will receive state cost-sharing grants for BMP installation. WDNR, DATCP and all counties within the RCR Basin will work with landowners to implement agricultural and non-agricultural performance standards and manure management prohibitions to address sediment and nutrient loadings in the RCR Basin. Both Barron and Dunn Counties have recently approved Management Plans, which detail implementation targets, funding sources, and various controls the counties have to help control TP loads.

The TMDL Report explains that federal funding such as Environmental Quality Incentive Program (EQIP), Conservation Reserve Program (CRP), and Conservation Reserve Enhancement Program (CREP) will be used as sources of funding for projects involving reduction in TP and TSS loads within the RCR Basin.

State funding such as the Targeted Runoff Management (TRM) Grant Program, the Notice of Discharge (NOD) Grant Program, the Urban Nonpoint Source and Storm Water Management Grant Program, and the River Planning and Protection Grant Program can be used to fund nonpoint source projects to improve the quality of Wisconsin's water resources by decreasing the impacts of nonpoint pollution.

EPA finds that the TMDL Report submitted by WDNR satisfies all requirements concerning 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.

Comment:
Page 27 of the TMDL discusses the monitoring efforts in the RCR Basin. Tainter Lake is monitored annually as part of the WDNR Lake Trend Monitoring program. This effort began in 2000, and consists of monitoring during spring turnover as well as monthly water quality from July to September. The USGS also has a gage site in the basin that monitors stream flow and monthly water quality in the Red Cedar River. The USGS has also installed monitoring equipment near the Town of Grant to evaluate water quality improvements from the Phosphorus Reductions Project in Grant. WDNR will continue monitoring efforts in the watershed, particularly after the TMDL implementation plan has been initiated.

Local efforts include the Red Cedar Basin Monitoring Group, which was organized in 2011. The volunteer group promotes and conducts water quality monitoring in several tributaries to Tainter Lake and Lake Menomin. Cyanobacteria (blue-green algae) is also monitored by the group for the National Oceanic and Atmospheric Administration (NOAA) and the Center for Disease Control (CDC). Aquatic invasive species are being monitored along with the "Clean Boats, Clean Waters" Program. Tainter Lake is also monitored under the Wisconsin Citizen Lake monitoring program, dating back to 1989.

EPA finds that the TMDL Report submitted by WDNR satisfies all requirements concerning this ninth element.

10. Implementation

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

Comment:
Page 18 of the TMDL explains how the implementation plan will be developed for the TMDL. As discussed in Section 8 and 9 above, WDNR identified numerous efforts either underway or recently completed in the watershed to try to restore the designated beneficial use and achieve standards. An implementation planning group has begun meeting, and WDNR identified several local groups that will be participating in the implementation efforts (Appendix G of the TMDL). As discussed above, WDNR has funded a position to develop a nonpoint source implementation plan to address the nine key elements of a CWA Section 319 management plan. The Implementation Plan will provide more specific details on funding, targeted subbasins, and opportunities for integrating existing efforts into a more cohesive plan.

EPA finds that the TMDL Report submitted by WDNR satisfies all requirements concerning this tenth element.

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 Report was made available for public comment for over 30 days from July 12 to August 19, 2011. WDNR held a public hearing on July 27, 2011, in Rice Lake, WI, and in Menomonie, WI on July 28, 2011. Additionally, WDNR made the TMDL Report available on its website: http://dnr.wi.gov/org/water/wm/wqs/303d/TMDL.html as well as the University Extension site at http://basineducation.uwex.edu/lowerchip/redcedar/index.html Members of the public could also contact WDNR to obtain a copy of the TMDL Report. WDNR reported significant comments on the draft TMDL; 59 verbal and written statements in support of the TMDL as well as 32 comments opposed or noting concerns about the TMDL. WDNR reviewed these comments and provided responses in Appendix F of the TMDL Report.

Several comments addressed the TMDL targets and the data used to develop the TMDL. Comments were raised on the selection of the TP target and the process used to evaluate impairments based upon TP. WDNR explained that although Tainter Lake and Lake Menomin are called lakes, they are actually defined as rivers under WDNR rules. As discussed in Section 2 of this Decision Document, WDNR determined that at the river TP criteria, the waterbodies would continue to have high chlorophyll-a levels. In Appendix B of the TMDL, WDNR explain how the target level of chlorophyll-a was determined. EPA agrees that this process is appropriate, and is consistent with EPA guidance (Protocol for Developing Nutrient TMDLs, EPA, 1999).

WDNR received comments requesting that the State establish the TP target level so as not to contribute to cyanobacterial blooms during the summer. In its response, the State notes that the listed impairments for Tainter Lake and Lake Menomin are related to excessive phosphorus and not the issue of cyanobateria. The State's response explains that addressing the issue of algal blooms is expected to reduce the frequency and density of cyanobacteria. As explained in Section 2 of today's Decision Document, EPA notes that while the science regarding cyanobacteria and phosphorus is improving, it is still unclear how reductions in phosphorus will impact cyanobacteria. EPA agrees that, as WDNR noted, the TMDL can be revised to account for necessary changes as the science regarding cyanobacteria further develops.

Several of the comments to WDNR focused on the data quality and the use of previous modeling efforts. WDNR explained that the model efforts from 1992 (BATHTUB) and 1997 (SWRRB) were still valid as land use and phosphorus data indicate that in-lake phosphorus concentrations have remained stable over that last 20 years. WDNR provided additional analysis of the land use and phosphorus transport mechanisms in the basin to determine if there had been significant changes that would affect the determination of phosphorus sources and allocations (Appendix H of the TMDL). As discussed in Section 3 of this Decision Document, the analysis shows that there have been changes in the watershed, but those changes have not significantly altered the phosphorus loading process as described in the original modeling efforts. WDNR also noted that additional work is planned for the watershed, as Tainter Lake and Lake Menomin are also listed as impaired due to pH exceedences. The State determined that there is insufficient data to

develop a pH TMDL at this time, although TP reductions should improved the pH values in the waterbodies. WDNR is expecting to develop the TMDLs in the near future, and is planning on performing additional sampling and modeling work to further determine phosphorus loading and impacts (Page 11 and Appendix H of the TMDL).

WDNR received comments regarding how the State will provide reasonable assurance for the TMDL and how reductions will be implemented. As noted by WDNR, a detailed implementation plan will be developed by the State which will describe activities, programs, and funding that will be used to achieve the goal of the TMDL. WDNR explained on Page 21 of the TMDL that:

> "Individual WPDES permits issued to municipal and industrial wastewater discharges to surface water will include limits that are consistent with the approved TMDL wasteload allocations. . . . Once a TMDL has been state and federally-approved, the permit for a point source that has been allocated a WLA by the TMDL may not be reissued without a limit that is consistent with the WLA. WDNR may modify an existing permit to include WLA-derived limits or wait until the permit is reissued to include WLA-derived limits. Facilities operating under general permits will be screened to determine whether additional requirements may be needed. . . . "

For nonpoint sources, the State explained that it intends to employ many different existing tools, including those available under the State's CWA Section 319 program, to implement and enforce controls on nonpoint source discharges including programs targeting agricultural practices, manure storage, nutrient management, and urban and agricultural runoff management (pages 21-23 of the TMDL). WNDR received comments regarding its method for allocating load reductions for agricultural sources. EPA guidance provides wide latitude to regulators to structure source assessments, recognizing that for sediment sources in particular, because of the diffuse nature of the source, grouping sources is an appropriate approach (USEPA, Protocol for Developing Nutrient TMDLs, 1999). The State has identified agricultural sources as being the primary contributor to TP loading in the Basin. The State's approach of subtracting other sectors of contributors, including background sources, from the overall load reduction needed for achieving the TMDL, to define a load allocation for the agricultural sector is not inconsistent with EPA guidance.

As stated above, an implementation plan is the appropriate means to work out specific allocation and reduction issues. Should planned allocations and reductions prove technically infeasible to implement, WDNR will need to implement others to ensure that the overall reductions to be achieved remain consistent with the TMDL as approved, so that applicable water quality standards are met.

EPA finds that the TMDL Report submitted by 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 water body, and the pollutant(s) of concern.

Comment:
The EPA received the final Tainter Lake and Lake Menomin TMDLs on June 11, 2012, accompanied by a submittal letter dated May 31, 2012. In the submittal letter, WDNR stated that the submission includes the final TMDLs for total phosphorus.

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

13. Conclusion

After a full and complete review, EPA finds that the TP TMDLs for Tainter Lake and Lake Menomin as identified in Table 1 satisfy all of the elements of an approvable TMDL. This approval document is for 2 waterbody segments impaired by total phosphorus for a total of 2 TMDLs. These TMDLs address the eutrophication impairments.

EPA's approval of this document does not extend to those waters that are within Indian Country, as defined in 18 U.S.C. § 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 CWA Section 303(d) for those waters.

EPA sent a letter to the Lac Courte Oreilles Band of Ojibwe in Wisconsin. In the letters, EPA offered the Tribal representative the opportunity to consult with the EPA regarding these TMDLs. EPA received no response to the letter.