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

MAR 15 2016

REPLY TO THE ATTENTION OF:
WW-16J

Rebecca J. Flood, Assistant Commissioner
Water Policy/Agriculture Liaison
Minnesota Pollution Control Agency
520 Lafayette Road North
St. Paul, MN 55155-4194

Dear Ms. Flood,

The U. S. Environmental Protection Agency has conducted a complete review of the final Total Maximum Daily Loads (TMDLs) for the Le Sueur River watershed including supporting documentation and follow up information. The Le Sueur River watershed is located in south central Minnesota in the Northern Central Hardwood Forest (NCHF) and Western Corn Belt Plains (WCBP) ecoregions within the Minnesota River Basin. The watershed drains portions of five counties (Blue Earth, Faribault, Freeborn, Steele and Waseca) in Minnesota. The TMDLs address the aquatic life use impairment resulting from low dissolved oxygen (total phosphorus as the surrogate) and aquatic recreation use impairment due to *E. coli* and Nutrient/Eutrophication Biological Indicators (total phosphorus as the surrogate).

The TMDLs meet the requirements of Section 303(d) of the Clean Water Act and EPA's implementing regulations at 40 C.F.R. Part 130. Therefore, EPA hereby approves Minnesota's 10 TMDLs for 10 segments in the Le Sueur River watershed. The statutory and regulatory requirements, and EPA's review of Minnesota's compliance with each requirement, are described in the enclosed decision document.

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

Sincerely,

Tinka G. Hyde
Director, Water Division

Enclosure

wq-iw7-39g

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cc: Celine Lyman, MPCA
Paul Davis, MPCA

TMDL: Le Sueur River Watershed, Minnesota, *E.coli*, Dissolved Oxygen, Total Phosphorus

Effective Date: March 15, 2016

Decision Document for Approval of the Le Sueur River Watershed, Minnesota, *E.coli*, Dissolved Oxygen, Total Phosphorus TMDL Report

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

1. Identification of Water body, Pollutant of Concern, Pollutant Sources, and Priority Ranking

The TMDL submittal should identify the water body as it appears on the State's/Tribe's 303(d) list. The water body 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 water body 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 water body. 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 water body 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: The Le Sueur River watershed is located in south central Minnesota in the Northern Central Hardwood Forest (NCHF) and Western Corn Belt Plains (WCBP) ecoregions within the Minnesota River Basin. Le Sueur River watershed covers 710,832 acres and drains portions of five counties (Blue Earth, Faribault, Freeborn, Steele and Waseca). The watershed drains to the northwest into the Blue Earth River (and subsequently into the Minnesota River) approximately two miles southwest of Mankato. Eagle Lake, Wells and Janesville are the largest towns in the largely rural watershed. The eastern portion of the watershed is a gently rolling landscape, while the western half of the watershed is dominated by the relatively flat remnant of glacial Lake Minnesota. Figure 3.1 of the TMDL is a map of the Le Sueur River watershed indicating the locations and the nature of impairments. The subwatersheds that are discussed in this TMDL report are identified in Table 1, Table 2 below identifies the land use for each segment.

Table 1 Waterbodies addressed by the Le Sueur River Watershed TMDL

Waterbody	Reach Description or Lake	Stream Use Class/ Lake Ecoregion and Type	Assessment Unit ID/Minnesota Department of Natural Resources (DNR) Lake #	Affected Designated Use	Pollutant or Stressor addressed
Little Cobb River	Bull Run Cr to Cobb R	2C	07020011-504	Aquatic Life	Dissolved Oxygen
Le Sueur River	CD 6 to Cobb R	2B	07020011-507	Aquatic Recreation	Escherichia coli
Boot Creek	Unnamed CR to T105 R22W S6, north line	7	07020011-516	Aquatic Recreation	Escherichia coli
Rice Creek	Headwaters to Maple R	2B	07020011-531	Aquatic Recreation	Escherichia coli
County Ditch 3 (Judicial Ditch 9)	JD 9 to Maple R	2B	07020011-552	Aquatic Recreation	Escherichia coli
Cobb River	T104 R26W S30, west line to Le Sueur R	2C	07020011-556	Aquatic Recreation	Escherichia coli
Madison	Lake	NCHF Lakes	07-0044-00	Aquatic Recreation	Nutrient/Eutrophication Biological Indicators
Elysian (Upper – u/s dam)	Lake	NCHF Lakes Shallow	81-0095-00	Aquatic Recreation	Nutrient/Eutrophication Biological Indicators
Eagle (North)	Lake	NCHF Lakes Shallow	07-0060-01	Aquatic Recreation	Nutrient/Eutrophication Biological Indicators
Freeborn	Lake	WCBP Shallow Lakes	24-0044-00	Aquatic Recreation	Nutrient/Eutrophication Biological Indicators

Streams

Le Sueur River (upstream of Cobb River) (segment 07020011-507)

The LeSueur River subwatershed unit lies in the northern half of the LeSueur River watershed. The watershed is 280 square miles and represents 25 percent of the entire LeSueur River watershed. The LeSueur watershed encompasses the main stem of the LeSueur River (about 110 miles), Eagle Lake, and several short and medium length county and judicial ditch systems. Cropland is the major land use within this watershed (79.2 percent), with some residential/urban land use (7.3 percent). The river starts in southwest Steele and northern Freeborn counties and flows west into central Waseca County and into northeastern Blue Earth County where it drains into the Blue Earth River two miles southwest of Mankato.

Boot Creek (segment 07020011-516)

The Boot Creek subwatershed is a 50 square mile watershed located in north central Freeborn and southern Waseca counties and comprises five percent of the LeSueur River watershed. The watershed land use is predominately agriculture (90.5 percent) with some residential/urban development (7.2 percent). Boot Creek flows north into the LeSueur River about two miles south of Otisco.

Cobb River (segment 07020011-556)

The Cobb River subwatershed unit lies roughly within the center of the Le Sueur River watershed. This 178 square mile watershed unit represents 16 percent of the Le Sueur River watershed. The watershed unit starts in northwestern Freeborn County near the town of Freeborn and flows west. The watershed then covers parts of Faribault and Waseca counties, and enters the southeastern corner of Blue Earth County. The predominant land uses within this subwatershed are cropland (83.7 percent) and residential/urban developed land (6.1 percent). Freeborn Lake is within the Cobb River subwatershed. The Cobb River drains to the LeSueur River 3.5 miles south of Mankato.

Little Cobb River (segment 07020011-504)

The Little Cobb subwatershed is located in the center of the LeSueur River watershed, and encompasses the southwestern part of Waseca County and the southeastern part of Blue Earth County. The Little Cobb flow west to the confluence with Cobb River just east of Beauford. The drainage area of the watershed unit is 132 square miles and represents 12 percent of the LeSueur River Watershed. Land use in this subwatershed is primarily cropland (86.6 percent) with some residential/urban development (5.8 percent).

County Ditch 3 (Judicial Ditch 9) (segment 07020011-552)

County Ditch 3 flows north to the confluence with the Maple River six miles south of Mapleton and is the main stream in the Easton subwatershed. The Easton subwatershed is located in the southwestern part of the LeSueur River Watershed. The drainage area of the Easton subwatershed is 68 square miles and represents six percent of the LeSueur River watershed. Land use in this subwatershed is predominately cropland (91.6 percent) with some residential/urban development (5.8 percent). This watershed unit is located in north-central Faribault County.

Rice Creek (segment 07020011-531)

The Rice Creek subwatershed lies within the southwestern portion of the Le Sueur River watershed and is located in north central Faribault County. This 81 square mile watershed represents 18 percent of the

LeSueur River watershed. Cropland (82.4 percent) and residential/urban development (5.5 percent) are the major land uses within this watershed. The Rice Creek subwatershed drains north into the Maple River through Rice Creek near Mapleton.

Lakes

Madison Lake (segment 07-0044-00)

The Madison Lake subwatershed lies along the northern boundary of the Le Sueur River watershed in eastern Blue Earth and small parts of western Waseca and Le Sueur counties. This subwatershed is 4,518 hectares (11, 166 acres) in size and represents two percent of the Le Sueur River watershed. Cropland and pasture (66.2 percent) are the major land uses within this area and there are eight lakes and wetlands which comprise 23.6 percent of the subwatershed area. The Madison Lake subwatershed drains into an unnamed tributary that eventually flows to the Le Sueur River near the Town of Eagle Lake through an outlet (07020011-605) south of Mud Lake.

Lake Elysian (Upper portion upstream of the dam) (segment 81-0095-00)

Lake Elysian is in the northern part of the Janesville subwatershed. County Ditch 6 (CD 6) flows out of the lake to the LeSueur River. Upper Elysian Lake is a large, shallow well-mixed lake located approximately one mile north of Janesville. Upper Elysian Lake's subwatershed size is moderate relative to its surface water area with a subwatershed area of 11,775 hectares (29,098 acres). Land use is dominated by cropland and pasture (78.2 percent) and open water/wetlands (12.4 percent).

Eagle Lake (North) (segment 07-0060-00)

Eagle Lake-North is the northern basin of Eagle Lake located approximately two miles east of Mankato. Eagle Lake-North is a shallow lake that is 193 hectares (479 acres) in size and covers 65 percent of the subwatershed. Land use within the Eagle Lake watershed is relatively typical of the NCHF ecoregion with the exception of a high percentage of open rangeland. Because Eagle Lake's close proximity to the border of the NCHF and WCBP ecoregions, the watershed land use is also similar to WCBP values.

Freeborn Lake (segment 24-0044-00)

Freeborn Lake is a large, shallow well-mixed lake located approximately seven miles northwest of Albert Lea. The town of Freeborn lies on the northern shore. The lake currently sees limited recreational use and has low water clarity and minimal aquatic vegetation. Land use is dominated by cultivated agricultural use that is typical for the WCBP ecoregion.

Table 2: Land use percentages in the Le Sueur Watershed and subwatersheds

Watershed/ Catchment	Percent Open Water	Percent Developed	Percent Barren/ Mining	Percent Forest/ Shrub	Percent Pasture/ Hay/ Grassland	Percent Cropland	Percent Wetland
Le Sueur River (entire watershed)	2.2	6.6	<1	1.5	3.8	82.5	3.5
Le Sueur River (U/S of Cobb River)	2.3	7.3	<1	2.1	5.4	79.2	3.7
Boot Creek	<1	7.2	<1	<1	1.37	90.5	<1
Cobb River	1.9	6.0	<1	<1	2.9	84.4	3.7
Little Cobb River	1.3	5.7	<1	<1	2.7	86.5	3.1
Rice Creek	4.4	5.5	<1	<1	2.8	81.9	4.8
County Ditch 3 (Judicial Ditch 9)	<1	5.7	<1	<1	1.2	91.3	<1
Madison Lake	16.3	7.2	< 1	4	9.1	56.1	7.3
Lake Elysian	9.3	4.9	< 1	4.8	11.2	67	3.1
Eagle Lake North	16.7	3.2	< 1	3.7	8.8	53.7	13.7
Freeborn Lake	27.8	5.6	<1	<1	4.9	54.1	7.2

Problem Identification/Pollutant(s) of Concern: As part of the MPCA Watershed Approach, streams, lakes, and wetlands throughout the Le Sueur River watershed were monitored for impacts to aquatic recreation, aquatic life, and aquatic consumption. A stream is considered impaired for impacts to aquatic life if the fish Index of Biotic Integrity (IBI), macroinvertebrate IBI, dissolved oxygen, turbidity, or certain chemical standards are not met. Streams are considered impaired for impacts to aquatic recreation if bacteria standards are not met. Lakes are considered impaired for impacts to aquatic recreation if total phosphorus, chlorophyll-A, or Secchi depth standards are not met.

This TMDL report addresses the aquatic life use impairment for one segment and the aquatic recreation use impairment for nine segments (Table 1 of this Decision Document). This TMDL addresses one pollutant for each of the 10 segments. The TMDL includes pollutant loads for *E. coli* and total phosphorus (TP), to address the following impairments: *E. coli*, DO, and Nutrient/Eutrophication Biological Indicators, as discussed in Section 2 of this Decision Document.

Source Identification: Section 3.6 of the TMDL report discusses the sources for both streams and lakes. MPCA cites to several reports which have been developed for different monitoring and assessments for the Le Sueur River watershed which are summarized in the submitted TMDL report.

Nonpoint Sources

E. coli - MPCA identified likely sources of bacteria for nonpoint source include unsewered communities, inadequate subsurface sewage treatment systems (SSTS), livestock, land-applied manure and pets. Both feedlots and pasture are present in the Le Sueur River Watershed. Livestock can contribute bacteria to the watershed through runoff from poorly managed feedlots as well as direct loading if allowed access to streams or lakes. Additional runoff can occur through manure applications on agricultural fields. Livestock numbers by watershed, based on the MPCA record of registered

feedlots, are included in Table 3.8 of the TMDL report. These feedlots are not considered to be concentrated animal feeding operations under EPA's NPDES rules.

MPCA determined that individual county estimates 25%-65% of SSTS to be in non-compliance with the each county's ordinance within the Le Sueur River watershe. These systems can discharge partially treated or untreated sewage and are potentially a continuous source of bacteria. The proportion contributed by these sources tends to be more significant during lower stream flow conditions. Inadequate SSTS can contribute to the *E.coli* impairment when septic effluent ponds on the surface due to such problems as soil compaction in the drainfield, mechanical breakdowns, or poor drainage. The effluent can then enter nearby streams.

Total Phosphorus - Elevated levels of phosphorus in rivers and streams, and lakes can result in: increased algae growth, reduced water clarity, reduced oxygen in the water, fish kills, altered fisheries, and toxins from cyanobacteria (blue green algae) which can affect human and animal health. Excessive amounts of nutrients, sediment and fertilizer from fields enter adjacent streams and rivers. Phosphorus can attach to soil particles, and therefore sediment washed in to the waterbodies can carry phosphorus into the system. Manure contains significant amounts of phosphorus, and when used as a fertilizer on farm fields, can be washed into streams and lakes. Manure from pasture land adjacent to the stream and from cattle with direct stream access are other sources of phosphorus. Additional sources of phosphorus include runoff from urban areas, construction sites, agricultural lands, or manure transported in runoff from feedlots.

Phosphorus loading may also come from direct atmospheric deposition to the surface of the lakes. Sources of particulate TP in the atmosphere may include pollen, soil erosion, oil and coal combustion and fertilizers. The atmospheric export coefficient used in the model was 0.3 kg/ha. The percent atmospheric load to the lakes ranged from 3.6% to 8.7%.

Internal loading also contributes to the nonpoint source phosphorus loads. Under anoxic conditions, weak iron-P bonds break, releasing P in a highly available form for algal uptake. Carp and other rough fish present in lakes can lead to increased nutrients in the water column as they uproot aquatic macrophytes during feeding and spawning and re-suspend bottom sediments. Over-abundance of aquatic plants can limit recreation activities and invasive aquatic species such as curly-leaf pondweed can change the dynamics of internal P loading.

Point Sources

There are ten NPDES permitted facilities in the Le Sueur River watershed, which are identified in Table 3 below. These facilities could be sources of *E. coli* and TP. There are currently two permitted Municipal Separate Storm Sewer System (MS4) communities with several others that will be receiving MS4 permits in the watershed. Stormwater can contain E. coli from pet wastes, geese, and other animals within the service area. Stormwater can also contain phosphorus from lawn fertilizer, animal wastes, and leaves and other organic detritus washed off during storm events. The status of the MS4 permits are identified in Table 4 below.

Minnesota Department of Transportation (MNDOT) within MS4 areas are required to have a wasteload allocation. To determine the MNDOT WLA, the applicable land area for MNDOT permit was divided

by the watershed area of the affected reach or lake. Table 4 below identifies the two MS4 areas with permits. The only segment to have MNDOT permits in the TMDL is the Le Sueur River, segment 07020011-507. There are no EPA regulated concentrated animal feeding operations in the watershed.

Table 3: WWTF permits in the Le Sueur watershed

Facility	Permit Number	Reach	City	System Type	Discharge Window
Delavan WWTF	MNG580109	Rice Creek -531	Delavan	Controlled discharge	3/1-6/15 and 9/15-12/31
Freeborn WWTF	MNG580018	Cobb -556	Freeborn	Controlled discharge	3/1-6/15 and 9/15-12/31
Hartland WWTF	MNG580102	Le Sueur River -507; Boot Creek -516	Hartland	Controlled discharge	3/1-6/15 and 9/15-12/31
Janesville WWTF	MNG580025	Le Sueur River -507	Janesville	Controlled discharge	3/1-6/15 and 9/15-12/31
Mapleton WWTF	MN0021172	Cobb -556	Mapleton	Controlled discharge	4/1-6/15 and 9/15-12/15
New Richland WWTF	MN0021032	Le Sueur River -507; Boot Creek -516	New Richland	Continuous discharge	NA
Pemberton WWTF	MNG580075	Little Cobb -504; Cobb-556	Pemberton	Controlled discharge	3/1-6/15 and 9/15-12/31
St. Clair WWTF	MN0024716	Le Sueur River -507	St. Clair	Continuous discharge	NA
Waldorf WWTF	MN0021849	Little Cobb -504; Cobb-556	Waldorf	Continuous discharge	NA
Waseca WWTF	MN0020796	Le Sueur River -507	Waseca	Continuous discharge	NA

Table 4 MS4 permits in the Le Sueur Watershed

Permit number	MS4 Community	Applicable Reach/Lake	Acreage(Percent) of MS4 area in applicable watershed
MS400226	City of Mankato	Le Sueur River, CD 6 to Cobb R; 07020011-507	1197 acres (0.4%)
MS400258	City of Waseca	Le Sueur River, CD 6 to Cobb R; 07020011-507	603 acres (0.2%)
*	Eagle Lake	Le Sueur River, CD 6 to Cobb R; 07020011-507	964 acres (0.3%)
*	Blue Earth County	Le Sueur River, CD 6 to Cobb R; 07020011-507	2346 acres (0.8%)
*	Mankato Township	Le Sueur River, CD 6 to Cobb R; 07020011-507	10758 acres (3.8%)
*	Mankato Township	Eagle Lake (North)	208 acres (6.7%)
*	Lime Township	Le Sueur River, CD 6 to Cobb R; 07020011-507	421 acres (.15%)
*	Lime Township	Eagle Lake (North)	602 acres (19

*Future permitted MS4s have not yet been assigned MS4 identification numbers. These will be assigned upon receipt of MS4 permit coverage. Until this time, future permitted MS4s are not subject to requirements of the MS4 permit.

Construction stormwater from housing or road construction projects near streams or lakes in the watershed could be a minimal source of phosphorus to the waterbodies.

Priority Ranking: Minnesota does not include separate priority rankings for its waters in the TMDL. The MPCA's projected schedule for TMDL completions, as indicated on the 303(d) impaired waters list, implicitly reflects Minnesota's priority ranking of these TMDLs. Ranking criteria for scheduling the TMDL projects include, but are not limited to: impairment impacts on public health and aquatic life; public value of the impaired water resource; likelihood of completing the TMDL in an expedient manner, including a strong base of existing data and restorability of the waterbody; technical capability and willingness locally to assist with the TMDL; and appropriate sequencing of TMDLs within a watershed or basin.

Future Growth/Reserve Capacity: Reserve capacity is an MPCA requirement to be considered and would be given an allocation of future growth when applicable. For the Le Sueur watershed MPCA has determined that a reserve capacity calculation is not applicable in this TMDL.

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

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

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

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

Comment:
Designated Use of Waterbody: The applicable water body classifications and water quality standards are specified in Minn. R. Ch. 7050. The Minn. R. Ch. 7050.0470 lists water body classifications and Minn. R. Ch. 7050.222 lists applicable water quality standards. The impaired waters covered in this TMDL are classified as Class 2B or 2C, 3B, 3C, 4A, 5, 6 and 7. Class 2B, 2C and 7 are the most stringent Classes for this watershed. Table 1 above lists the appropriate impaired designated use for each waterbody.

Class 2B waters – 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.

Class 2C waters – The quality of Class 2C surface waters shall be such as to permit the propagation and maintenance of a healthy community of indigenous fish and associated aquatic life, and their habitats. These waters shall be suitable for boating and other forms of aquatic recreation for which the waters may be usable.

Class 7 waters - The quality of Class 7 waters of the state shall be such as to protect aesthetic qualities, secondary body contact use, and groundwater for use as a potable water supply.

The water quality standards that apply to the Le Sueur stream reaches are shown in Table 5 below. Lake water quality standards specific to ecoregion and lake type (depth) are shown in Table 6 below.

Table 5: Surface water quality standards for Le Sueur River watershed stream reaches

Parameter	Water Quality Standard	Units	Criteria	Period of Time Standard Applies
Escherichia coli Class 2 waters	Not to exceed 126	org/100 ml	Monthly geometric mean	April 1 – October 31
	Not to exceed 1,260	org/100 ml	To be exceeded no more than 10% of the time	
Dissolved Oxygen	Daily minimum of 5.0	mg/L	100 percent of days above 7Q10 flow; 50 percent of days at 7Q10 flow	Year round

Table 6: Surface water quality standards for Lakes in the Le Sueur River watershed

Ecoregion/Type	Total Phosphorus Standard (µg/L)	Chlorophyll –a Standard (µg/L)	Secchi Depth Standard (m)	Period of Time Standard Applies
NCHF/ Lakes	< 40	< 14	> 1.4	June 1 – September 30
NCHF/Shallow Lakes	< 60	< 20	>1.0	June 1 – September 30
WCBP/Shallow Lakes	< 90	< 30	> 0.7	June 1 – September 30

NCHF = North Central Hardwood Forest
WCBP = Western Corn Belt Plains

Surrogate Target:

TP for DO

Modeling results developed by MPCA determined that low dissolved oxygen is related to the high phosphorus loadings. High phosphorus loads to the streams cause excessive production of algae. At night, bacterial, plant and animal respiration depletes oxygen. MPCA determined that a 40% reduction of TP would result in attainment of the DO standard. Phosphorous allocations were subsequently developed with consideration of these model results to address the DO impairment.

Other Targets:

TP

MPCA found that TP above the given standard in Table 6 above for the respective lakes was the stressor to fish and macroinvertebrates, resulting in the impaired aquatic life use. The *Assessment Report of Selected Lakes Within the Le Sueur River Watershed Minnesota River Basin* determined that due to high phosphorus there were high algal levels, as demonstrated by the high chl-a levels in the lakes. MPCA determined that the lakes are not supporting the aquatic recreational use.

MPCA selected total phosphorus levels for the lakes as identified in Table 4 above to develop the lake nutrient TMDLs. MPCA determined that by addressing the phosphorus levels in the lakes the chl-a, as well as Secchi depth would be achieved. Algal abundance is measured by chl-a, which is a pigment found in algal cells. As more phosphorus becomes available, algae growth can increase. Increased algae in the water column decreases water clarity. Secchi depth is the measurement of the water clarity. By reducing the TP this will reduce the chl-a which in turn increases the Secchi depth readings of the lake.

E.coli

The *E.coli* target for the streams in the Le Sueur watershed were set at the Class 2 WQS of 126 organisms per 100 mL geometric mean and the not-to-exceed 1,260 organisms per 100 mL (more than 10 percent of the time) as stated above, which is applicable from April 1st through October 31st. However, the focus of this TMDL is on the "chronic" standard of 126 org/100 mL (geometic mean portion). MPCA believes that the geometric mean is the more relevant value in determining water quality. While the TMDL will focus on the geometric mean portion of the WQS, compliance is required with both parts of the WQS as identified in Table 5 above.

As noted in Table 1 above Boot Creek is identified as being a Class 7 water. Class 7 waters are less restrictive use and are thus subject to less stringent *E. coli* standards. However, MPCA developed the TMDL for Boot Creek at the more restrictive level (Class 2) because Boot Creek discharges into a Class 2 water. By being conservative in the loading for Boot Creek MPCA has determined that this should assure that the downstream water will be protected and will help maintain compliance with the Class 2 standard.

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

3. Loading Capacity - Linking Water Quality and Pollutant Sources

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

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

relationship between the numeric target and the identified pollutant sources. In many instances, this method will be a water quality model.

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

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

Comment:
Loading Capacity for Streams:
E. coli loading capacity for streams
The duration curve approach was utilized to address the E. coli impairments.

Load duration analysis method: A flow duration curve was developed using the full range of hydrological conditions from data collected using April through October, 1996 through 2009 daily average flow data. The resultant curve shows flow values and the frequency that the flow is exceeded. All flow conditions are represented.

Typically loading capacities are expressed as a mass per time (e.g. pounds per day). However, for *E. coli* loading capacity calculations, mass is not always an appropriate measure because *E. coli* is expressed in terms of organism counts. This approach is consistent with the EPA's regulations which define "load" as "an amount of matter that is introduced into a receiving water" (40 CFR §130.2). To establish the loading capacities for the Le Sueur River bacteria TMDLs, MPCA used Minnesota's water quality standards for *E. coli* (126 cfu/100 mL). A loading capacity is, "the greatest amount of loading that a water can receive without violating water quality standards." (40 CFR §130.2). Therefore, a loading capacity set at the WQS will assure that the water does not violate WQS. MPCA's *E. coli* TMDL approach is based upon the premise that all discharges (point and nonpoint) must meet the WQS when entering the water body. If all sources meet the WQS at discharge, then the water body should meet the WQS and the designated use.

MPCA determined that the geometric mean portion of the WQS provides the best overall characterization of the status of the watershed. The EPA agrees with this assertion, as stated in the preamble of *The Water Quality Standards for Coastal and Great Lakes Recreation Waters Final Rule* (69 FR 67218-67243, November 16, 2004) on page 67224, "...the geometric mean is the more relevant value for ensuring that appropriate actions are taken to protect and improve water quality because it is a more reliable measure, being less subject to random variation, and more directly linked to the underlying studies on which the 1986 bacteria criteria were based."

The load duration curve was developed using the flow multiplied by the standard or target concentration (126 org/100ml *E. coli*). The curves in the Appendix of the TMDL Report represents the loads meeting the *E. coli* criteria. The points above the curve are WQS exceedences. Review of the Load Duration Curves for the Le Sueur River, Boot Creek, Rice Creek and County Ditch 9 indicates that under all flow conditions the criteria load was exceeded. For the Cobb River conditions at the higher end of the curve appear to have the larger exceedances. The curves demonstrates that the 126 org/100ml *E. coli* value is exceeded under all flow conditions. The TMDL for each flow regime was established by using the midpoint flow condition multiplied by the concentration target.

Flow zones were determined for very high, high, mid, low and very low flow conditions. The mid-range flow value for each flow zone was then multiplied by the standard of 126 org/100ml to calculate the loading capacity. The method used for determining these *E. coli* TMDLs is consistent with EPA technical memos.[1]

Tables 8-12 of this Decision Document report five points (the midpoints of the designated flow regime) on the loading capacity curve. However, it should be understood that the components of the TMDL equation could be illustrated for any point on the entire loading capacity curve. The load duration curve method can be used to display collected bacteria monitoring data and allows for the estimation of load reductions necessary for attainment of the bacteria water quality standard. Using this method, daily loads were developed based upon the flow in the water body. Loading capacities were determined for the segment for multiple flow regimes. This allows the TMDL to be represented by an allowable daily load across all flow conditions. Although there are numeric loads for each flow regime, the LDC is what is being approved for this TMDL.

Total Phosphorus for Little Cobb Creek

MPCA used the calibrated Hydrologic Simulation Program – FORTRAN (HSPF) to develop the TMDL for the Little Cobb Creek which is impaired for low DO. HSPF is a comprehensive model that simulates watershed hydrology and water quality for conventional and toxic pollutants. HSPF incorporates watershed-scale Agricultural Runoff Model (ARM) and non-point source (NPS) models into a basin-scale analysis framework that includes fate and transport in one dimensional stream channels. It accounts for a variety of runoff processes along with in-stream hydraulic and sediment-chemical interactions. Within a delineated subwatershed, areas with similar land uses are aggregated and a uniform set of parameter values are applied to that land category. Upland responses within a subwatershed are simulated on a per-acre basis and converted to net loads to stream reaches the upland represents. Within each subwatershed, the upland areas are separated into multiple land use categories. Within the Le Sueur River watershed, dissolved oxygen, runoff, phosphorus and flow simulated output were used for analysis and TMDL calculations.

The HSPF model was used to identify the pollutant of concern causing the low dissolved oxygen. Model scenarios demonstrated that dissolved oxygen is sensitive to phosphorus. HSPF model scenarios were used to determine the phosphorus load reductions necessary to meet the dissolved oxygen standard and thereby support aquatic life.

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[1] *See U.S. Environmental Protection Agency, August 2007, An Approach for Using Load Duration Curves in the Development of TMDLS, Office of Water. EPA-841-B-07-2006, Washington, D.C.*

The TP allocation was developed in consideration of model results. While data from the last 10 years contributed to the watershed assessments, the majority of data utilized for the 2010 assessment was collected in 2008. DO concentrations where flows are below the 7Q10 (seven-day consecutive low flow with a 10 year return frequency) are not subject to the DO standard. Daily model output for the Little Cobb River were used to estimate the 7Q10 using the statistical flow analysis tool DFLOW. The 7Q10 was determined to be 0 cfs. Due to this fact, a non-zero compliance point was chosen and the model was evaluated for DO standard compliance at flows above 1 cfs, the 95th percentile flow of the 1996-2009 Little Cobb USGS gage data.

MPCA developed a compliance scenario through several iterative runs of the calibrated model. For each model run, once the NPS TP was reduced by a given percentage, the percent reduction of phytoplankton settling as a result was viewed. The phytoplankton settling reduction percentage was then applied to the sediment oxygen demand (SOD) constant to get a subsequent reduction in SOD. This is due to the fact that less P would grow less algae, therefore decreasing the algae dying and settling to the bottom and contributing to SOD. A 40% reduction of nonpoint TP resulted in a modeled attainment of the DO standard. Phosphorous allocations were subsequently developed with consideration of these model results to address the DO impairment. Given reasonable modeling assumptions regarding algal growth, algal respiration, and in-stream re-aeration rate, the TP allocation for Little Cobb Creek was calculated to be **68 lbs/day** (Table 7 of this Decision Document).

Loading Capacity for all Lakes:

Total Phosphorus

The U.S. Army Corps of Engineers BATHTUB model was used in the determination of the loading for nutrients. The BATHTUB model applies a series of empirical equations derived from assessments of lake data and performs steady state water and nutrient calculations based on lake morphometry and tributary inputs. The BATHTUB model requires fairly simple inputs to predict phosphorus loading. The model accounts for pollutant transport, sedimentation, and nutrient cycling. The model was used to determine both the current load and the load needed to meet water quality standards for each lake.

The BATHTUB version 6.14 model framework was used as a basis for modeling phosphorus and water loading for lakes within the Le Sueur River watershed. To calculate the P load capacity of each lake, external P inputs were reduced within the model until the predicted in-lake concentration matched the appropriate standard as identified in Table 6 above. The loading capacities and TMDL summaries for each lake are in Tables 13-16 of this Decision Document.

Critical Condition:

E. coli

The critical condition for the E. coli is the June – September for most segments in the Le Sueur Watershed. The Cobb River is the exception where the only available monthly geometric mean exceeding the standard is from September. The duration curve approach using multiple years of flow data and the applicable time period of the standard will provide sufficient water quality protection during the critical summer period.

Total Phosphorus for Little Cobb Creek

Daily minimum dissolved oxygen concentrations are at their lowest in the summer low flow season for

the Little Cobb River. TMDL allocations assigned during the summer growing season will protect the lakes and streams during the worst water quality conditions of the year. During the summer, temperatures and algal/plant growth are high, contributing to stress on the waterbodies. Modeling TP reductions under the summer conditions will ensure that standards are attained during these critical times.

Total Phosphorus for Lakes
Water quality monitoring in Madison, Elysian, Eagle North and Freeborn Lakes suggests the in-lake TP concentrations vary over the course of the growing season (June – September), generally peaking in mid to late summer. MPCA developed the total phosphorus loading to meet the water quality standards during the summer growing season, the most critical period of the year.

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

4. Load Allocations (LAs)

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

Comments:
Load Allocation: The load allocations are discussed in Sections 3 and 4 of the TMDL report. MPCA determined that nonpoint sources of TP and *E. coli* include: agricultural run-off, livestock – both feed lots and pastures, inadequate SSTS, and pets. Descriptions of each loading type are discussed in Section 1 of this document. Although MPCA identified several land uses and processes that can contribute the pollutants, LAs were calculated as gross allocations.

MPCA determined available LAs by calculating the loading capacity and subtracting the wasteload allocations and a 10% margin of safety. Each load allocation includes nonpoint pollution sources that are not subject to an NPDES permit as well as "natural background" sources such as wildlife. Tables 7 through 16 at the end of this document identify the LA for each segment.

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

5. Wasteload Allocations (WLAs)

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

The individual WLAs may take the form of uniform percentage reductions or individual mass based limitations for dischargers where it can be shown that this solution meets WQSs and does not result in localized impairments. These individual WLAs may be adjusted during the NPDES permitting process.

If the WLAs are adjusted, the individual effluent limits for each permit issued to a discharger on the impaired water must be consistent with the assumptions and requirements of the adjusted WLAs in the TMDL. If the WLAs are not adjusted, effluent limits contained in the permit must be consistent with the individual WLAs specified in the TMDL. If a draft permit provides for a higher load for a discharger than the corresponding individual WLA in the TMDL, the State/Tribe must demonstrate that the total WLA in the TMDL will be achieved through reductions in the remaining individual WLAs and that localized impairments will not result. All permittees should be notified of any deviations from the initial individual WLAs contained in the TMDL. EPA does not require the establishment of a new TMDL to reflect these revised allocations as long as the total WLA, as expressed in the TMDL, remains the same or decreases, and there is no reallocation between the total WLA and the total LA.

Comments:
NPDES permits-There are ten Waste Water Treatment Facilities (WWTF) located in the Le Sueur River watershed. Some of these facilities can be a significant source of *E. coli* during low flow periods. The ten WWTFs discharge into the impaired stream reaches addressed in the TMDL report. Six of these facilities have controlled discharge (pond) systems with allowable discharge peroids during higher flows. These controlled discharge facilities are not likely to be a source during low flow periods. The other four facilities are continuous discharge systems and are likely a source during low flow periods. During extreme high flow conditions, WWTFs may also be a source if they become overloaded and have an emergency discharge of partially or untreated sewage, known as a bypass. Table 4 above identifies the WWTF and associated reach.

For *E. coli*, the WLAs for the continuous discharge facilities were calculated by multiplying the design flow by the permit limit of 126 org/100 ml limit. For the controlled discharge facilities, the WLAs were calculated by multiplying the permit limit of 126 org/100 ml by the maximum permitted discharge flow (based upon a 6 inch per day discharge from the ponds). Table 17 of this Decision Document contains the individual *E. coli* WLAs for each facility.

During the calculations of the WLAs, MPCA determined that the design flow discharge would exceed the "very low" in-stream flows. To account for this, MPCA expressed the loading as an equation rather than an absolute number.

Allocation = flow from facility x 126 org/100 ml.

MPCA explained that the NPDES permit limits apply regardless of facility discharge flow, and therefore any discharge complying with such limits will not exceed the in-stream criteria (Section 4.3.1 of the TMDL).

For TP in the Little Cobb River, there are two NPDES dischargers, the Waldorf WWTP, which is a continuous discharger, and the Pemberton WWTP, which is a controlled discharger. Both facilities discharge upstream of the impaired segment of the Little Cobb River. The WLA for the Waldorf WWTP is **2.8 lbs/day**. MPCA calculated the WLA based upon the current permitted effluent limit times the design flow of the facility. For the Pemberton facility, MPCA committed to revising the permit to prevent discharge from June to September, the time period during which the eutrophication criteria applies. This technically results in a WLA of 0 for the Pemberton WWTP, but MPCA noted the NPDES

permit will determine the specific conditions for discharge for the Pemberton facility (Section 4.3.1 of the TMDL)

For the lakes, MPCA determined that there are no NPDES facilities in the watersheds.

Minnesota Department of Transportation (MNDOT) Permit- MNDOT highways and right of ways within MS4 areas are required to have a wasteload allocation. To determine the MNDOT WLA, the applicable land area for each was divided by the watershed area of the affected reach or lake. This percent was then apportioned to the MNDOT WLA allocation after the MOS was subtracted from the total LC. The only segment that has an MNDOT permits is Le Sueur River, 07020011-507.

MS4 Communities - There are small portions of two MS4 communities in the Le Sueur River upstream of the confluence with the Cobb River (AUID 07020011-507): the City of Mankato and the City of Waseca. Eagle Lake and portions of Blue Earth County, Mankato Township and Lime Township are likely to become subject to MS4 permit requirements in the near future. To determine the WLA for each MS4 the applicable land area for each was divided by the watershed area of the affected reach or lake (Table 4.6 of the TMDL). In the lake watershed, the area of the lake was subtracted from the potential future MS4 area as the lake itself cannot be developed. This percent was then apportioned to the MS4 allocation after the MOS was subtracted from the total loading capacity. Permit numbers and status of the MS4 communities can be found in Table 4 above.

Construction and Industrial stormwater - MPCA set aside 1% of the total loading capacity to account for TP loading from construction stormwater and from industrial stormwater. This WLA accounts for any construction stormwater or industrial stormwater generated within the TMDL watersheds (Section 4.1.2.2 of the TMDL). Construction stormwater permit application records indicate approximately 0.61% of land use in the study area has been subject to construction over the last 10 years. Industrial stormwater permit application records indicate approximately 0.07% of land use in the study area has been subject to permitted industrial activity over the last 10 years.

MPCA explained that BMPs and other stormwater control measures should be implemented at active construction sites to limit the discharge of pollutants of concern. BMPs and other stormwater control measures which should be implemented at construction sites are defined in the State's NPDES/State Disposal System (SDS) General Stormwater Permit for Construction Activity (MNR100001). If a construction site owner/operator obtains coverage under the NPDES/SDS General Stormwater Permit and properly selects, installs and maintains all BMPs required under the permit, including those related to impaired waters discharges and any applicable additional requirements found in Appendix A of the Construction General Permit, the stormwater discharges would be expected to be consistent with the WLA in this TMDL.

The WLA for stormwater discharges from sites where there is industrial activity reflects the number of sites in the watershed for which NPDES industrial stormwater permit coverage is required, and the BMPs and other stormwater control measures that should be implemented at the sites to limit the discharge of pollutants of concern. BMPs and other stormwater control measures which should be implemented at the industrial sites are defined in the State's NPDES/SDS Industrial Stormwater Multi-Sector General Permit (MNR050000) or NPDES/SDS General Permit for Construction Sand & Gravel,

Rock Quarrying and Hot Mix Asphalt Production facilities (MNG490000). If a facility owner/operator obtains coverage under the appropriate NPDES/SDS General Stormwater Permit and properly selects, installs and maintains all BMPs required under the permit, the stormwater discharges would be expected to be consistent with the WLA in this TMDL.

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

6. Margin of Safety (MOS)

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

Comments:
E. coli
The use of the LDC approach minimized variability associated with the development of the Le Sueur River bacteria TMDLs because the calculation of the loading capacity was a function of flow multiplied by the target value. The MOS was set at 10% to account for uncertainty due to field sampling error and assumptions made during the TMDL development process.

Challenges associated with stormwater *E. coli* loads include the dynamics and complexity of bacteria in streams. Factors such as die-off and re-growth contribute to general uncertainty that makes stormwater bacteria loads particularly difficult. The MOS for the Le Sueur River bacteria TMDL also incorporated certain conservative assumptions in the calculation of the TMDLs. No rate of decay, or die-off rate of pathogen species, was used in the TMDL calculations or in the creation of load duration curves for *E. coli*. Bacteria have a limited capability of surviving outside their hosts, and normally a rate of decay would be incorporated. MPCA determined that it was more conservative to use the WQS (126 cfu/100 mL) and not to apply a rate of decay, which could result in a discharge limit greater than the WQS.

As stated in *EPA's Protocol for Developing Pathogen TMDLs* (EPA 841-R-00-002), many different factors affect the survival of pathogens, including the physical condition of the water. These factors include, but are not limited to sunlight, temperature, salinity, and nutrient deficiencies. These factors vary depending on the environmental condition/circumstances of the water, and therefore it would be difficult to assert that the rate of decay caused by any given combination of these environmental variables was sufficient enough to meet the WQS of 126 cfu/100 mL. Thus, it is more conservative to apply the State's WQS as the MOS, because this standard must be met at all times under all environmental conditions.

Dissolved Oxygen as TP for Little Cobb Creek
An explicit MOS was set at 10% to account for uncertainty due to field sampling error and assumptions made during the TMDL development process. MPCA has determined that is expected to provide an adequate accounting of uncertainty based upon the HSPF modeling and calibration/validation.

TP (all lakes)
An explicit MOS of 10% was used for the TP lake TMDLs in the Le Sueur watershed. Calibration and validation of the BATHTUB model shows the model adequately represents the lake systems. MPCA therefore determined, and EPA agrees no additional MOS is needed.

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

7. Seasonal Variation

The statute and regulations require that a TMDL be established with consideration of seasonal variations. The TMDL must describe the method chosen for including seasonal variations. (CWA §303(d)(1)(C), 40 C.F.R. §130.7(c)(1)).
Comments:
E. coli for Streams
Concentrations of *E. coli* vary throughout the summer in the Le Sueur River Watershed. While the standard is a geometric mean from April-October based on all available data in the impaired reach, June-September is the critical time period for exceedances of the E. coli standard in this watershed. The only exception is the Cobb River where the only available monthly geometric mean exceeding the standard is September. The duration curve approach using multiple years of flow data and the applicable time period of the standard will provide sufficient water quality protection during the critical summer period.

Total Phosphorus for Lakes
Water quality monitoring in Madison, Elysian, Eagle North and Freeborn Lakes suggests the in-lake TP concentrations vary over the course of the growing season (June – September), generally peaking in mid to late summer. The MPCA eutrophication water quality standards for assessing TP is defined as the June through September mean concentration. The BATHTUB model was used to calculate the load capacities of each lake, incorporating mean growing season TP values. TP loadings were calculated to meet the water quality standards during the summer growing season, the most critical period of the year. Calibration to this critical period will provide adequate protection during times of the year with reduced loading.

Total Phosphorus for Little Cobb Creek
DO concentrations change seasonally and daily in response to shifts in ambient air and water temperature, along with various chemical, physical, and biological processes within the water column. If dissolved oxygen concentrations become limited or fluctuate dramatically, aerobic aquatic life can experience reduced growth or fatality. In most streams and rivers, the critical conditions for stream DO usually occur during the late summer season when water temperatures are high and stream flows are reduced to base flow. As temperatures increase, the saturation levels of dissolved oxygen decrease. MPCA indicated in the TMDL that daily minimum dissolved oxygen concentrations are at their lowest in the summer low flow season. MPCA determined, and EPA agrees that reducing the TP loading in the

stream to the level in the TMDL should provide adequate protection during the differing times of the year.

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

8. Reasonable Assurances

When a TMDL is developed for waters impaired by point sources only, the issuance of a National Pollutant Discharge Elimination System (NPDES) permit(s) provides the reasonable assurance that the wasteload allocations contained in the TMDL will be achieved. This is because 40 C.F.R. 122.44(d)(1)(vii)(B) requires that effluent limits in permits be consistent with "the assumptions and requirements of any available wasteload allocation" in an approved TMDL.

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

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

Comments:
Section 5 of the TMDL report discusses mechanisms that give reasonable assurance that the TMDL will be met. The majority of pollutant reductions in the Le Sueur watershed will need to come from NPS contributors in order for the impaired waters to meet water quality standards. Of these sources, agricultural drainage and surface runoff are the dominant sources, while other NPSs contribute a small portion of the pollutant loads. To best assure that NPS reductions are achieved, a large emphasis has been placed on citizen engagement, where the citizens and communities that hold the power to improve water quality conditions are involved in discussions and decision-making. In addition to citizen engagement, several government programs have been created to support a political and social infrastructure that aims to increase the adoption of strategies that will improve watershed conditions.

There are currently several citizen groups working in the Le Sueur River Watershed, includeing:

- The Le Sueur River Watershed Network-composed of watershed residents, concerned citizens and groups, and resource agency staff.
- Lake Focus Group - A one-time meeting was held in February 2014, to solicit the preferred restoration and protection strategies of citizens who are interested in improving and protecting lakes within the Le Sueur River Watershed.

- Resident and Farmer interviews - the objectives of these interviews were to: 1) connect residents and local staff, 2) learn resident opinions and concerns regarding water quality, and 3) provide maps and resources to spur conversations and identify conservation opportunities.

Clean Water Legacy Act: The CWLA was passed in Minnesota in 2006 for the purposes of protecting, restoring, and preserving Minnesota water. The CWLA provides the protocols and practices to be followed in order to protect, enhance, and restore water quality in Minnesota.
The CWLA outlines how MPCA, public agencies and private entities should coordinate in their efforts toward improving land use management practices and water management. The CWLA anticipates that all agencies (i.e., MPCA, public agencies, local authorities and private entities, etc.) will cooperate regarding planning and restoration efforts. Cooperative efforts would likely include informal and formal agreements to jointly use technical, educational, and financial resources.

The CWLA also provides details on public and stakeholder participation, and how the funding will be used. In part to attain these goals, the CWLA requires MPCA to develop Watershed Restoration and Protection Strategies (WRAPS). The WRAPS are required to contain such elements as the identification of impaired waters, watershed modeling outputs, point and nonpoint sources, load reductions, etc. (Chapter 114D.26; CWLA). The WRAPS also contain an implementation table of strategies and actions that are capable of achieving the needed load reductions, for both point and nonpoint sources (Chapter 114D.26, Subd. 1(8); CWLA). Implementation plans developed for the TMDLs are included in the table, and are considered "priority areas" under the WRAPS process (Watershed Restoration and Protection Strategy Report Template, MPCA). This table includes not only needed actions but a timeline for achieving water quality targets, the reductions needed from both point and nonpoint sources, the governmental units responsible, and interim milestones for achieving the actions. MPCA has developed guidance on what is required in the WRAPS (Watershed Restoration and Protection Strategy Report Template, MPCA). Section 10 of this Decision Document identifies in greater detail the strategies in the WRAPS report.

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 2014 Clean Water Fund Competitive Grants Request for Proposal (RFP); Minnesota Board of Soil and Water Resources, 2014).

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

9. Monitoring Plan to Track TMDL Effectiveness

EPA's 1991 document, *Guidance for Water Quality-Based Decisions: The TMDL Process* (EPA 440/4-91-001), recommends a monitoring plan to track the effectiveness of a TMDL, particularly when a TMDL involves both point and nonpoint sources, and the WLA is based on an assumption that nonpoint source load reductions will occur. Such a TMDL should provide assurances that nonpoint source controls will achieve expected load reductions and, such TMDL should include a monitoring plan that describes the additional data to be collected to determine if the load reductions provided for in the TMDL are occurring and leading to attainment of water quality standards.

Comments:
Section 6 of the TMDL report discusses the monitoring efforts that will continue in the watershed by MPCA based on MPCA's monitoring cycle set out in Minnesota's Water Quality Monitoring Strategy. MPCA employs an intensive watershed monitoring schedule that provides comprehensive assessments of all of the major watersheds (HUC 8 digit) on a ten-year cycle. This schedule provides intensive monitoring of streams and lakes within each major watershed to identify overall health of the water resources, to identify impaired waters, and to identify those waters in need of additional protection to prevent future impairments. The monitoring and assessment work described in the TMDL report and other associated reports identified in the TMDL will be repeated beginning in 2018.

EPA finds that the TMDL document submitted by MPCA adequately addresses 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:
Activities envisioned to implement the TMDL are identified in Section 7 of the TMDL report. MPCA has developed a Le Sueur Watershed conditions and restoration and protection strategies (WRAPS) report. The purpose of the WRAPS report is to develop and present scientifically- and civically-supported restoration and protection strategies to be used for water and conservation planning and implementation in a watershed. It also summarize watershed approach work done to date. Below is a summary of the recommended strategies in the WRAPS report, all of which cannot be credited toward WLA reductions for MS4 communities with permit requirements:

- No-till or strip till conservation tillage
- Cover crops and grassed waterways
- Nutrient, manure, and animal management
- Water retention and increased evapotranspiration from the landscape (basins, wetlands, extended retention)
- Field and riparian vegetated buffers Drainage volume reductions by system design
- Drainage water pollutant reductions through edge-of-field treatments (bioreactors, saturated buffers, treatment wetlands)
- Citizen education and discussions
- Urban stormwater Best Management Practices (BMPs)
- Changes in policy and increased funding and other support
- Protect currently higher quality areas

Additional information on these strategies can be found in the WRAPS report.

For the MS4, construction and Industrial stormwater discharges the WLA for stormwater discharges from sites where there are construction activities reflects the number of construction sites one or more acres expected to be active in the watershed at any one time, and the BMPs and other stormwater control measures that should be implemented at the sites to limit the discharge of pollutants of concern. The BMPs and other stormwater control measures that should be implemented at construction sites are defined in the State's NPDES/SDS General Stormwater Permit for Construction Activity (MNR100001).

EPA finds that the TMDL document submitted by MPCA adequately addresses this tenth element. EPA review but does not approve implementation plans.

11. Public Participation

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

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

Comments:
Section 8 of the TMDL report discusses public participation. There has been four civic engagement/public participation efforts sponsored by the MPCA in collaboration with local partners: 1) Le Sueur River Watershed Network, 2) Lakes Focus Group, and 3) Citizen and farmer interviews conducted by soil and water conservation districts (SWCD) staff.

MPCA held a public comment period on the TMDLs in this submittal from March 30, 2015, to April 29, 2015. MPCA received several comment letters on the TMDL and associated WRAPS report which was public noticed together, and responded to these comments. EPA reviewed the comments and responses, which focused primarily on implementation actions, and various options proposed by the commentors. Many options and ideas were outside the purview of the MPCA, but MPCS did note several additional ideas to follow up on, and revised the TMDL where appropriate to address necessary changes and corrections. After a close review of the comments and responses, EPA agrees that the comments have been addressed appropriately.

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

12. Submittal Letter

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

The submittal letter, whether for technical review or final review and approval, should contain such identifying information as the name and location of the water body, and the pollutant(s) of concern.

Comment:
The transmittal letter was dated August 17, 2015 from Rebecca J. Flood, Assistant Commissioner, MPCA, to Tinka Hyde, Water Division Director, EPA Region 5. The letter stated that this was a TMDL submittal for final approval of ten TMDLs addressing ten impairments in the Le Sueur River Watershed. The impairments were as follows: one impairment to address low dissolved oxygen, five impairments for *E. coli* and four lake eutrophication impairments.

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

13. Conclusion

After a full and complete review, EPA finds that the TMDL for the Le Sueur River Watershed satisfies all of the elements of an approvable TMDL. This approval document is for ten water body segments impaired for at least one of the following: E.coli, Dissolved Oxygen, and Nutrient/Eutrophication Biological Indicators as identified in Table 1 above. There are 10 TMDLs which address impairments from the final approved 2012 Minnesota 303(d) list. EPA's approval of this document 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 CWA Section 303(d) for those waters.

Table 7 TP TMDL Summary for Little Cobb River

Total Phosphorus	**lbs/day**
Loading Capacity	**68.00**
Wasteload Allocation*	
Permitted Wastewater Treatment Facilities** Waldorf WWTF Pemberton WWTF	2.8
Construction and industrial Stormwater	0.6
Livestock facilities requiring NPDES permits	NA
"Straight Pipe" Septic Systems	0
Load Allocation	**57.8**
MOS	**6.8**

*No Communities Subject to MS4 NPDES requirements are located in this subwatershed.
** Waldorf is given the 2.8 lbs/day as the current TP permit limit. Pemberton will not be allowed to discharge in June-September which is the critical period for this TMDL for TP.

Table 8: *E. coli* TMDL summary for AUID#07020011-507 Le Sueur River (CD6 to Cobb River)

E. coli	**Flow Zones**				
	Very High	High	Mid	Low	Very Low
	Billion Organisms per day				
Loading Capacity	**4741**	**1369**	**557**	**167**	**37**
Wasteload Allocation	**282.1**	**109.2**	**67.5**	**47.6**	**
Permitted Wastewater Treatment Facilities*** Hartland WWTF Janesville WWTF New Richland WWTF St Clair WWTF Waseca WWTF	39	39	39	39	**
Communities Subject to MS4 NPDES Requirements					
Mankato	17.1	4.9	2.0	0.6	**
Waseca	8.5	2.5	1.0	0.3	**
Eagle Lake*	12.8	3.7	1.5	0.5	**
Blue Earth County*	34.1	9.9	4.0	1.2	**
Mankato Township*	162.1	46.8	19.0	5.7	**
Lime Township*	6.4	1.8	0.754	0.23	**
Minnesota Department of Transportation	2.1	0.6	0.3	0.08	**
Livestock facilities requiring NPDES permits	NA	NA	NA	NA	NA
"Straight Pipe" Septic Systems	0	0	0	0	0
Load Allocation	**3984.9**	**1122.8**	**433.5**	**102.4**	**
MOS	**474**	**137**	**56**	**17**	**17**

*Future permitted MS4s have not yet been assigned an MS4 identification numbers. These will be assigned upon receipt of MS4permit coverage. Until this time, future permitted MS4s are not subject to requirements of the MS4 permits. Because they will be considered in the near future MPCA assigned them loads under the WLA.

**Computed allocation exceeds low flow allocation, therefore allocation = (flow contribution from a given source) x (126 org/100ml). See section 4.3 of the TMDL Report for more details.

***The loads identified in each flow regime is an aggregate of each permitted treatment facility. Table 17 of this document identifies loadings from each permitted discharger.

Table 9: *E. coli* TMDL Summary for AUID#07020011-516 Boot Creek (Unnamed Creek to T105N R22W S6, North line)

E. coli	Flow Zones				
	Very High	High	Mid	Low	Very Low
	Billion Organisms per day				
Loading Capacity	**564**	**137**	**51**	**17**	**4**
Wastload Allocation*	**5**	**5**	**5**	**5**	**
Permitted Wastewater Treatment Facilities*** Hartland WWTF New Richland WWTF	5	5	5	5	**
Livestock facilities requiring NPDES permits	NA	NA	NA	NA	NA
"Straight pipe" Septic Systems	0	0	0	0	0
Load Allocation	**502**	**117**	**41**	**10**	**
MOS	**56**	**14**	**5**	**2**	**0**

*No Communities subject to MS4 NPDES requirements in the watershed.
**Computed allocation exceed low flow allocation, therefore allocation = (flow contribution from a given source) x (126 org/100ml). See section 4.3 of the TMDL Report for more details.
***The loads identified in each flow regime is an aggregate of each permitted treatment facility. Table 17 of this document identifies loadings from each permitted discharger.

Table 10: *E. coli* TMDL Summary for AUID#07020011-531. Rice Creek (Headwaters to Maple River)

E. coli	Flow Zones				
	Very High	High	Mid	Low	Very Low
	Billion Organisms per day				
Loading Capacity	**938**	**209**	**76**	**17**	**2**
Wasteload Allocation*	**2**	**2**	**2**	**2**	**
Permitted Wastewater Treatment Facilities*** Delavan WWTF	2	2	2	2	**
Livestock facilities requiring NPDES permits	NA	NA	NA	NA	NA
"Straight pipe" Septic Systems	0	0	0	0	0
Load Allocation	**842**	**186**	**66**	**13**	**
MOS	**94**	**21**	**8**	**2**	**0**

*No Communities subject to MS4 NPDES requirements in the watershed.
**Computed allocation exceed low flow allocation, therefore allocation = (flow contribution from a given source) x (126 org/100ml). See section 4.3 of the TMDL Report for more details.
***The loads identified in each flow regime is an aggregate of each permitted treatment facility. Table 17 of this document identifies loadings from each permitted discharger.

Table 11: *E. coli* TMDL Summary for AUID#07020011-552 County Ditch 3 (Judicial Ditch 9) (JD9 to Maple River)

E. coli	**Flow Zones**				
	Very High	High	Mid	Low	Very Low
	Billion Organisms per day				
Loading Capacity	**827**	**178**	**59**	**17**	**2**
Wasteload Allocation*	**0**	**0**	**0**	**0**	**0**
Livestock facilities requiring NPDES permits	NA	NA	NA	NA	NA
"Straight pipe" Septic Systems	0	0	0	0	0
Load Allocation	**744**	**160**	**53**	**15**	**2**
MOS	**83**	**18**	**5.9**	**2**	**0**

*No WWTFs or Communities subject to MS4 NPDES requirements in the watershed.
**Computed allocation exceed low flow allocation, therefore allocation = (flow contribution from a given source) x (126 org/100ml). See section 4.3 of the TMDL Report for more details.

Table 12: *E. coli* TMDL Summary for AUID#07020011-556. Cobb River (T104 R26W S30, west line to the Le Sueur River)

E. coli	**Flow Zones**				
	Very High	High	Mid	Low	Very Low
	Billion Organisms per day				
Loading Capacity	**3380**	**1068**	**338**	**58**	**5**
Wasteload Allocation*	**22**	**22**	**22**	**22**	**
Permitted Wastewater Treatment Facilities*** Freeborn WWTF Mapleton WWTF Permberton WWTF Waldorf WWTF	22	22	22	22	**
Livestock facilities requiring NPDES permits	NA	NA	NA	NA	NA
"Straight pipe" Septic Systems	0	0	0	0	0
Load Allocation	**3020**	**940**	**282**	**30**	**
MOS	**338**	**107**	**34**	**6**	**

*No Communities subject to MS4 NPDES requirements in the watershed.
**Computed allocation exceed low flow allocation, therefore allocation = (flow contribution from a given source) x (126 org/100ml). See section 4.3 of the TMDL Report for more details.
***The loads identified in each flow regime is an aggregate of each permitted treatment facility. Table 17 of this document identifies loadings from each permitted discharger.

Table 13: TP TMDL Summary AUID#07-0044-00 Madison Lake

Total Phosphorus	**Lbs per day**
Loading Capacity	**6.19**
Wasteload Allocation*	**0.06**
Construction and Industrial Stormwater and Industrial Process Wastewater	0.06
Livestock facilities requiring NPDES permits	0
"Straight Pipe" Septic Systems	0
Load Allocation	**5.51**
MOS	**0.62**

*No Communities subject to MS4 NPDES requirements in the watershed.

Table 14: TP TMDL Summary for AUID#81-0095-00 Lake Elysian

Total Phosphorus	**Lbs per day**
Loading Capacity	**13.98**
Wasteload Allocation*	**0.13**
Construction and Industrial Stormwater and Industrial Process Wastewater	0.13
Livestock facilities requiring NPDES permits	0
"Straight Pipe" Septic Systems	0
Load Allocation	**12.45**
MOS	**1.4**

*No Communities subject to MS4 NPDES requirements in the watershed.

Table 15: TP TMDL Summary for AUID#07-0060-01 Eagle Lake North

Total Phosphorus	**Lbs per day**
Loading Capacity	**1.3**
Wasteload Allocation	**0.32**
Mankato Township MS4 permit*	0.08
Lime Township MS4 permit*	0.23
Construction and Industrial Stormwater and Industrial Process Wastewater	0.01
Livestock facilities requiring NPDES permits	0
"Straight Pipe" Septic Systems	0
Load Allocation	**0.85**
MOS	**0.13**

*Future permitted MS4s have not yet been assigned an MS4 identification numbers. These will be assigned upon receipt of MS4permit coverage. Until this time, future permitted MS4s are not subject to requirements of the MS4 permits. Because they will be considered in the near future they were assigned loads under the WLA.

Table 16: TP TMDL Summary for AUID#24-0044-00Eagle Lake North

Total Phosphorus	**Lbs per day**
Loading Capacity	**5.12**
Wasteload Allocation	**0.05**
Construction and Industrial Stormwater and Industrial Process Wastewater	0.05
Livestock facilities requiring NPDES permits	0
"Straight Pipe" Septic Systems	0
Load Allocation	**4.56**
MOS	**0.51**

*No Communities subject to MS4 NPDES requirements in the watershed.

Table 17: Individual *E. coli* WLAs for the Le Sueur Watershed

Facility	**Permit number**	**Design Flow (mgd)**	**WLA billion org/day**
Delevan	MNG580109	0.407	1.941
Freeborn	MNG580018	0.244	1.164
Hartland	MNG580102	0.396	1.889
Janesville	MNG580025	3.421	16.315
Mapleton	MN0021172	3.583	17.088
New Richland	MN0021032	0.6	2.861
Pemberton	MNG580075	0.652	3.109
Saint Clair	MN0024716	0.212	1.011
Waldorf	MN0021849	0.096	0.458
Waseca	MN0020796	3.5	16.692