REGION 5
CHICAGO, IL 60604

May 23, 2025

Mr. Glenn Skuta
Watershed Division Director
Minnesota Pollution Control Agency
520 Lafayette Road North
St. Paul, MN 55155-4194

Dear Mr. Skuta:

The U.S. Environmental Protection Agency completed its review of the final 2025 Total Maximum Daily Load (TMDL) for the Le Sueur River Watershed (LSRW), including supporting documentation. The LSRW is in south-central Minnesota in parts of Blue Earth, Faribault, Freeborn, Steele, and Waseca Counties. The LSRW TMDLs address impaired aquatic recreation use due to excessive bacteria and impaired aquatic life use due to excessive phosphorus.

The TMDLs meet the requirements of Section 303(d) of the Clean Water Act and the EPA's implementing regulations set forth at 40 C.F.R. Part 130. Therefore, the EPA approves Minnesota's one TMDL for bacteria and three TMDLs for phosphorus for a total of four TMDLs. The EPA describes Minnesota's compliance with the statutory and regulatory requirements in the enclosed decision document.

The EPA acknowledges Minnesota's efforts in submitting this revised TMDL and look forward to future TMDL submissions by the State of Minnesota. If you have any questions, please contact Mr. David Werbach, at 312-886-4242 or Werbach.david@epa.gov.

Sincerely,

5/23/2025

X

Tera L. Fong
Division Director, Water Division
Signed by: TERA FONG

cc: Andrea Plevan, MPCA
Paul Davis, MPCA

wq-iw7-63g

TMDL: Le Sueur River Watershed (2025) bacteria and phosphorus TMDLs in portions of Blue Earth, Faribault, Freeborn, Steele, and Waseca Counties in south-central Minnesota
Date: 05/23/2025

DECISION DOCUMENT FOR THE LE SUEUR RIVER WATERSHED TMDLS (2025) IN SOUTH-CENTRAL MINNESOTA

Section 303(d) of the Clean Water Act (CWA) and the 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 the EPA to determine if a submitted TMDL fulfills the legal requirements for approval under Section 303(d) and the 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 the 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 the 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 the 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.

The EPA Review of the Le Sueur River TMDL

Location Description/Spatial Extent:

The Le Sueur River Watershed (LSRW) in south-central Minnesota is part of the Minnesota River basin and covers parts of Blue Earth, Faribault, Freeborn, Steele, and Waseca Counties (Section 3.0 of the final TMDL document). A previous TMDL for the Le Sueur River Watershed (August 2015) was approved by the EPA on March 15, 2016. The previous TMDL addressed total phosphorus and bacteria in various waters in the watershed. All citations in this Decision Document address the 2025 Le Sueur River TMDL submittal unless specifically noted.

The LSRW is approximately 1,109 square miles in size and is mainly within the Western Cornbelt Plains (WCBP) ecoregion (Figure 3.1 of the final Le Sueur River 2015 TMDL document). The LSRW originates in Freeborn County, and the watershed contains several significant tributaries, including the Cobb River, Little Cobb River, and Maple Creek (Figure 1 of the final TMDL document). The Le Sueur River and tributaries flow north-northwest until the Le Sueur River joins the Great Blue Earth River, which then joins the Minnesota River 3 miles downstream.

The LSRW TMDL addresses one impaired river segment due to excessive bacteria and three impaired river segments due to excessive phosphorus (Table 1 of this Decision Document, and Table 1 and Appendix A of final TMDL document).

Several TMDL projects have been approved in the LSRW (Section 1.1 of the final TMDL document). One water body addressed in the Le Sueur River Watershed 2015 TMDL is also addressed in the Le Sueur River Watershed 2025 TMDL; the Little Cobb River (Segment -504). The 2015 TMDL for the Little Cobb River (-504) utilized a slightly higher phosphorus target, and MPCA is replacing the 2015 TMDL for the Little Cobb River (-504) with a new phosphorus TMDL based upon the State river eutrophication criteria (see Section 3 of this Decision Document for further discussion).

MPCA also noted that two larger basin-scale TMDLs (*Lower Minnesota River Dissolved Oxygen Total Maximum Daily Load Report* (2004) and the *Lake Pepin and Mississippi River Eutrophication Total Maximum Daily Load Report* (2021)) include wasteload allocations (WLAs) for phosphorus for facilities in the Le Sueur River Watershed. As discussed further in Section 5 of this Decision Document, MPCA reviewed the WLAs to address any impacts on the local water quality of the Le Sueur River, as well as potential downstream impacts.

Table 1. Impaired water bodies in the Le Sueur River Watershed addressed in this 2025 TMDL report.

AUID	Water body name	Water body description	Use class	Affected designated use	Listing Parameter	TMDL Pollutant
07020011-501	Le Sueur River	Maple R to Blue Earth R	2Bg	AQL	Nutrients	TP
					Fish bioassessment*	
07020011-556	Cobb River	T107 R26W S30, west line to Le Sueur R	2Bg	AQL	Nutrients	TP
					Fish bioassessment*	
					Macroinvertebrate bioassessment*	
07020011-504	Little Cobb River	Bull Run Cr to Cobb R	2Bg	AQL	Nutrients	TP**
					Fish bioassessment*	
					Dissolved Oxygen**	
07020011-576	Iosco Creek	Silver Cr to T108 R23W S7, west line	2Bg	AQR	*E. coli*	*E. coli*

AQR: aquatic recreation; AQL: aquatic life; TP: total phosphorus

* These TMDLs address only one of the identified pollutant stressors causing aquatic life impairment; the reaches will remain as category 5 until all identified stressors are addressed (see Appendix A of the final TMDL document for full list of stressors)

** This TMDL replaces the 2015 phosphorus TMDL for Little Cobb River (-504) and addresses both the dissolved oxygen impairment and the nutrient impairment

The MPCA explained that the LSRW is not located within the boundary of any federally recognized Tribal land. No TMDLs developed as part of the 2025 LSRW TMDL project allocates any pollutant loads to any federally recognized Indian nation in this watershed (Section 1.3 of the final TMDL document).

Land Use:

Land use in the LSRW is primarily agricultural with limited urbanization in the impaired watersheds (Section 3.4 and Figure 7 of the final TMDL document). The overall land use in the LSRW is approximately 80% cropland, 7% forested land and wetlands, 3% pasture/grassland and the remaining approximate 10% divided between developed/barren land and open water.

Table 2. Land cover in TMDL subwatersheds

Impairment type	WID	Water body name	Corn	Soybeans	Other crops [a]	Fallow/ idle cropland	Grassland / pasture	Developed / Barren	Forest and shrub	Wetland	Open water [b]
Streams, phosphorus	501	Le Sueur River	42.2%	36.9%	1.7%	<0.1%	2.8%	5.2%	2.6%	6.6%	2.1%
	504	Little Cobb River	43.5%	39.2%	1.8%	<0.1%	2.2%	4.4%	1.2%	6.5%	1.2%
	556	Cobb River	44.2%	36.4%	1.3%	<0.1%	2.3%	4.6%	1.9%	7.0%	2.3%
Streams, *E. coli*	576	Iosco Creek	46.5%	31.3%	1.8%	<0.1%	4.3%	4.3%	5.1%	6.5%	0.3%

a. Other crops include spring wheat, oats, alfalfa, other hay, and peas.
b. Open water includes the surface area of the impaired water bodies.

Problem Identification:
Bacteria TMDL: The impaired segment identified in Table 1 of this Decision Document was included on the final 2024 Minnesota 303(d) list due to excessive bacteria. Water quality monitoring within the LSRW indicated that this segment was not attaining the designated aquatic recreation uses due to exceedances of the bacteria criteria. Excessive bacteria can negatively impact recreational uses (e.g., swimming, wading, boating, fishing etc.) and public health. At elevated levels, bacteria may cause illness within humans who have contact with or ingest bacteria laden water. Recreation-based contact can lead to ear, nose, and throat infections, and stomach illness.

Phosphorus TMDLs: The water bodies identified in Table 1 of this Decision Document were included on the final 2024 Minnesota 303(d) list due to excessive nutrients (phosphorus). Total phosphorus (TP), chlorophyll-*a* (chl-a), dissolved oxygen flux, biochemical oxygen demand (BOD) and pH measurements indicated that the impaired stream was not attaining the designated aquatic recreation use. Water quality monitoring was completed throughout the LSRW, and that data formed the foundation for phosphorus TMDL modeling efforts.

While phosphorus is an essential nutrient for aquatic life, elevated concentrations of phosphorus can lead to nuisance algal blooms that negatively impact aquatic life and recreation (e.g., swimming, boating, fishing, etc.). Algal decomposition depletes dissolved oxygen levels within the water column. The decreases in dissolved oxygen can stress benthic macroinvertebrates and fish. Depletion of oxygen in the water column can also lead to conditions where phosphorus is released from bottom sediments (i.e., internal loading). Also, excess algae can shade the water column which limits the distribution of aquatic vegetation. Aquatic vegetation stabilizes bottom sediments, and also is an important habitat for macroinvertebrates and fish.

Priority Ranking:
The MPCA's schedule for TMDL completions, as indicated on the 303(d) impaired waters list, reflects Minnesota's priority ranking of this TMDL. The MPCA has aligned TMDL priorities with the watershed approach and Watershed Restoration and Protection Strategy (WRAPS) cycle. The schedule for TMDL completion corresponds to the WRAPS report completion on the 10-year cycle. Mainstem river TMDLs, which are not contained in major watersheds and thus not addressed in WRAPS, must also be completed. The MPCA developed a state plan, Minnesota's TMDL Priority Framework Report under the EPA's Long-Term Vision for Assessment, Restoration and Protection under the CWA section 303(d) program. As part of these efforts, the MPCA identified water quality-impaired segments that will be addressed by TMDLs by 2032. The waters of the LSRW addressed by this TMDL are part of the MPCA prioritization plan to meet the EPA's national goals.

Pollutants of Concern:
The pollutants of concern are bacteria and phosphorus.

Source Identification (point and nonpoint sources):

Point Source Identification: The potential point sources to the LSRW are:

LSRW bacteria TMDL:
MPCA determined that no point sources discharging bacteria are located within the Iosco Creek segment (Section 3.7.1.1 of the final TMDL document).

LSRW phosphorus TMDLS:
National Pollutant Discharge Elimination Systems (NPDES) permitted facilities: NPDES permitted facilities may contribute phosphorus loads to surface waters through discharges of treated wastewater. Permitted facilities must discharge wastewater according to their NPDES permit. The MPCA determined that there are 13 municipal wastewater treatment plants (WWTPs) that discharge into the phosphorus-impaired segments (Table 9 of the final TMDL document). Of the 13, two are pond facilities prohibited from discharging from June 1-September 30, and thus not during the critical summer season. MPCA did not determine a WLA for these two facilities. MPCA did determine WLAs for the remaining 11 facilities.

Municipal Separate Storm Sewer System (MS4) communities: There are seven communities noted by the MPCA within the LSRW that could be contributing phosphorus. Stormwater from MS4s can transport phosphorus to surface water bodies during or shortly after storm events. MPCA noted that these communities were assigned a portion of the WLA (Sections 3.7.1.2 and 4.5.4.2 of the final TMDL document and Table 6 of this Decision Document).

Stormwater runoff from permitted construction and industrial areas: Construction and industrial sites may contribute phosphorus via sediment runoff during stormwater events. These areas within the LSRW watershed must comply with the requirements of the MPCA's NPDES Stormwater Program and create a Stormwater Pollution Prevention Plan (SWPPP) that summarizes how stormwater will be minimized from the site (Sections 3.7.1.3 and 4.5.4.3 of the final TMDL document).

Concentrated Animal Feedlot Operations (CAFOs): MPCA has identified 114 CAFOs (86 with State or Federal permits) in the LSRW (Sections 3.7.1.5 and 4.5.4.5 of the final TMDL document). As explained by MPCA, CAFO production areas must be designed to contain all manure, and direct precipitation and manure-contaminated runoff from discharging to surface waters during precipitation events up to the 25-year, 24-hour storm event. In the event of a discharge, the discharge cannot cause or contribute to a violation of a water quality standard (WQS). MPCA noted that any precipitation-caused runoff from the land application of manure where the manure has been land applied at agronomic rates is not considered a point source discharge and is accounted for in the load allocation (LA) of the LSRW TMDL.

Nonpoint Source Identification:
The potential nonpoint sources to the LSRW are:

LSRW bacteria TMDL:
The MPCA utilized data from several sources to develop an overall bacteria source estimate for the LSRW bacteria TMDL (Section 3.7 of the final TMDL document).

Stormwater from agricultural land use practices and feedlots near surface waters: Animal Feeding Operations (AFOs) in close proximity to surface waters can be a source of bacteria to water bodies in

the LSRW. These areas may contribute bacteria via the mobilization and transportation of pollutant laden waters from feeding, holding and manure storage sites. Runoff from agricultural lands may contain significant amounts of bacteria which may lead to impairments in the LSRW. Feedlots generate manure which may be spread onto fields. Runoff from fields with spread manure can be exacerbated by tile drainage lines, which channelize the stormwater flows and reduce the time available for bacteria to die-off.

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

Discharges from Subsurface Sewage Treatment Systems (SSTS) or unsewered communities: Failing septic systems are a potential source of bacteria within the LSRW. Septic systems generally do not discharge directly into a water body, but effluents from SSTS may leach into groundwater or pond at the surface where they can be washed into surface waters via stormwater runoff events. Age, construction, and use of SSTS can vary throughout a watershed and influence the bacteria contribution from these systems.

Failing SSTS are specifically defined as systems that are failing to protect groundwater from contamination, while those systems which discharge partially treated sewage to the ground surface, road ditches, tile lines, and directly into streams, rivers and lakes are considered an imminent threat to public health and safety (ITPHS). ITPHS systems also include illicit discharges from unsewered communities.

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

LSRW phosphorus TMDLs:

Stormwater runoff from agricultural land use practices: Runoff from agricultural lands may contain significant amounts of nutrients, organic material and organic-rich sediment which may lead to impairments in the LSRW. Manure spread onto fields is often a source of phosphorus, and can be exacerbated by tile drainage lines, which channelize the stormwater. Tile lined fields and channelized ditches enable particles to move more efficiently into surface waters. Phosphorus, organic material and organic-rich sediment may be added via surface runoff from upland areas which are being used for Conservation Reserve Program (CRP) lands, grasslands, and agricultural lands used for growing hay or other crops. Stormwater runoff may contribute nutrients and organic-rich sediment to surface waters from livestock manure, fertilizers, vegetation and erodible soils. The MPCA notes there are animal feedlots within the LSRW (Figure 14 and Table 13 of the final TMDL document).

Discharges from SSTS or unsewered communities: Failing septic systems are a potential source of nutrients within the LSRW watershed. Septic systems generally do not discharge directly into a water body, but effluents from SSTS may leach into groundwater or pond at the surface where they can be washed into surface waters via stormwater runoff events. Age, construction and use of SSTS can vary throughout a watershed and influence the nutrient contribution from these systems.

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

Upstream impaired lakes: MPCA noted that there are five nutrient-impaired lakes upstream of segments addressed in the LSRW 2025 TMDL. All five lakes have approved TMDLs to meet the appropriate water criteria. MPCA considered the impacts of outflow from the lakes on the river water quality in the 2025 TMDL effort (Section 3.7.2.3 of the final TMDL document).

Future Growth:
The MPCA noted that the TMDL watershed is largely agricultural and contains limited urban areas. MPCA acknowledged that the potential for future growth in the watershed is limited. MPCA did not include a calculation for reserve capacity (RC) for the Iosco Creek (-576) bacteria TMDL but did include a calculation of RC for the three total phosphorus TMDLs (Tables 6-8 of this Decision Document). MPCA explained that RC for the phosphorus impaired reaches was set-aside to account for potential future efforts to address failing or nonconforming septic systems and unsewered communities (Section 4.5.5 and Table 22 of the final TMDL document). The RC will be made available to new WWTPs or existing WWTPs that service communities with failing or nonconforming septic systems or unsewered communities. In order to calculate a RC component for each of the three TP TMDLs, MPCA employed a per capita per year TP loading estimate with a reduction efficiency estimate (Section 4.5.5 of the final TMDL document).

The WLAs and LAs for the LSRW TMDLs were calculated for all current and future sources. Any expansion of point or nonpoint sources will need to comply with the respective WLA and LA values calculated in the LSRW TMDLs.

The EPA finds that the TMDL document submitted by the MPCA satisfies the requirements of the first criterion.

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)). The 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.

The EPA Review of the Le Sueur River TMDL:

Designated Uses:

Water quality standards (WQS) are the fundamental benchmarks by which the quality of surface waters is measured. Within the State of Minnesota, WQS are developed pursuant to the Minnesota Statutes Chapter 115, Sections 03 and 44. Authority to adopt rules, regulations, and standards as are necessary and feasible to protect the environment and health of the citizens of the State is vested with the MPCA. Through adoption of WQS into Minnesota's administrative rules (principally Chapters 7050 and 7052), the MPCA has identified designated uses to be protected in each of its drainage basins and the criteria necessary to protect these uses.

Minnesota Rule Chapter 7050 designates uses for waters of the state. The segments addressed by the LSRW TMDLs are designated as Class 2 waters for aquatic recreation use (bacteria) and aquatic life use (phosphorus). The Class 2 designated use is described in Minnesota Rule 7050.0140:

> *"Aquatic life and recreation includes all waters of the state that support or may support fish, other aquatic life, bathing, boating, or other recreational purposes and for which quality control is or may be necessary to protect aquatic or terrestrial life or their habitats or the public health, safety, or welfare." (Class 2)*

Water use classifications for individual water bodies are provided in Minnesota Rules 7050.0470, 7050.0425, and 7050.0430. This TMDL report addresses the water bodies that do not meet the standards for Class 2 waters. The impaired streams in this report are classified as Class 2B (Table 1 of the final TMDL document).

Standards:

Narrative Criteria:

Minnesota Rule 7050.0150 (3) set forth narrative criteria for Class 2 waters of the State:

> *"For all Class 2 waters, the aquatic habitat, which includes the waters of the state and stream bed, shall not be degraded in any material manner, there shall be no material increase in undesirable slime growths or aquatic plants, including algae, nor shall there be any significant increase in harmful pesticide or other residues in the waters, sediments, and aquatic flora and fauna; the normal fishery and lower aquatic biota upon which it is dependent and the use thereof shall not be seriously impaired or endangered, the species composition shall not be altered materially, and the propagation or migration of the fish and other biota normally present shall not be prevented or hindered by the discharge of any sewage, industrial waste, or other wastes to the waters."*

Numeric criteria:

Bacteria TMDL: The bacteria water quality standards which apply to the LSRW TMDL are:

Table 3: Bacteria Water Quality Standards Applicable to the LSRW TMDLs

Parameter	Units	Water Quality Standard
E. coli [1]	# of organisms / 100 mL	Not to exceed 126 organisms per 100 milliliters (org/100 mL) as a geometric mean of not less than five samples representative of conditions within any calendar month, nor shall more than 10% of all samples taken during any calendar month individually exceed 1,260 organisms per 100 milliliters.

[1] = Standards apply only between April 1 and October 31

Bacteria TMDL Targets: The bacteria TMDL targets employed for the LSRW bacteria TMDL are the *E. coli* standards as stated in Table 3 of this Decision Document. The focus of this TMDL is on the **126 organisms per 100 mL** (126 orgs/100 mL) portion of the standard. The MPCA believes that using the 126 orgs/100 mL portion of the standard for TMDL calculations will result in the greatest bacteria reductions within the LSRW and will result in the attainment of the 1,260 orgs/100 mL portion of the standard. While the bacteria TMDLs will focus on the geometric mean portion of the water quality standard, attainment of both parts of the water quality standard is required.

***Phosphorus TMDLs*:** Numeric thresholds for phosphorus, chl-*a*, dissolved oxygen flux, biological oxygen demand, and pH are set forth in Minnesota Rules 7050.0222. These parameters form the MPCA eutrophication standard that must be achieved to attain the aquatic life designated use (Section 2.4.2 and Table 3 of the final TMDL document; Table 4 of this Decision Document).

Table 4. Surface water quality standards for LSRW River Eutrophication Standards impaired reaches

Standard	Parameter	Water Quality Standard[4]	Units	Criteria	Period of Time Standard Applies
River Eutrophication – Southern Rivers Nutrient Region	Total Phosphorus (causative[1])	Not to exceed 150	µg/L	Summer Mean	June - September
	Chlorophyll-*a* (response[2])	Not to exceed 35	µg/L	Summer Mean	June - September
	Diel dissolved oxygen flux (response[2])	Not to exceed 4.5	mg/L	Summer Mean	June - September
	5-day Biochemical Oxygen Demand (response[2])	Not to exceed 3.0	mg/L	Summer Mean	June – September
	pH (response[2])	Not to be less than 6.5 or greater than 9.0	su[3]	Summer Mean	June - September

[1] Primary, causative indicator of impairment; must be exceeded to be assessed as impaired.
[2] Secondary, response indicator of impairment; one of the four response parameters must be exceeded to be assessed as impaired.
[3] pH is standard units.
[4] Minn R. 7050.0222 incorrectly lists water quality standards for chl-*a*, DO flux and BOD for 2B Southern Nutrient River Region streams. These errors will be addressed in future rule making efforts. The Standards approved by EPA are presented in Table 4 of this decision document and Table 3 of the final TMDL document.

Phosphorus TMDL Target): MPCA determined that the target for the river TMDL is total phosphorus (Sections 2.4.2 and 4.5.1 of the final TMDL document). The TMDL target is **150 µg/L** for the LSRW River Eutrophication Standards TMDL. For the impaired stream segments, a phosphorus exceedance and at least one response variable outlined in Table 3 of the final TMDL document (Table 4 of this Decision Document) is necessary for the stream reach to be considered impaired.

In developing the eutrophication standards for Minnesota rivers, MPCA evaluated data from a large cross-section of rivers within each of the State's ecoregions. Clear relationships were established between the causal factor (phosphorus), and the response variables (chl-a, dissolved oxygen flux, biological oxygen demand, and pH). MPCA anticipates that by meeting the phosphorus concentrations of Southern River Nutrient Region (SRNR) WQS, the response variables will be attained, and the LSRW will achieve the designated beneficial uses. MPCA noted that the WQS apply to summer mean values, from June 1 to September 30 (Section 2.4.2 of the final TMDL document).

The EPA finds that the TMDL document submitted by the MPCA satisfies the requirements of the first criterion.

3. Loading Capacity - Linking Water Quality and Pollutant Sources

A TMDL must identify the loading capacity of a water body for the applicable pollutant. The 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. The 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.

The EPA Review of the Le Sueur River TMDL:

LSRW bacteria TMDL: The MPCA used the geometric mean (**126 orgs/100 mL**) of the *E. coli* water quality standard to calculate loading capacity values for the bacteria TMDLs. The MPCA believes the geometric mean 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 MPCA stated that the bacteria TMDLs will focus on the geometric mean portion of the water quality standard (126 orgs/100 mL) and that it expects that by attaining the 126 orgs/100 mL portion of the *E. coli* WQS the 1,260 orgs/100 mL portion of the *E. coli* WQS will also be attained. The EPA finds these assumptions to be reasonable.

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 LSRW bacteria TMDLs, the MPCA used Minnesota's WQS for *E. coli* (126 orgs/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. The 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.

A separate flow duration curve (FDC) was created for the bacteria TMDL in the LSRW. The LSRW FDC was developed using flow data generated from Hydrologic Simulation Program-Fortran (HSPF) modeling efforts at the outlet/pour point of the impaired reach as well as data from a flow gage on the Le Sueur River (Section 3.5 of the final TMDL document). The MPCA focused on daily recorded flow

measurements and HSPF modeled flows from approximately 1996 to 2017 and bacteria (*E. coli*) water quality data from 2017-2020. HSPF hydrologic models were developed to simulate flow characteristics within the LSRW, and flow data focused on dates within the recreation season (April 1 to October 31). Daily stream flows were necessary to implement the load duration curve (LDC) approach.

HSPF is a comprehensive modeling package used to simulate watershed hydrology and water quality on a basin scale. The package includes both an Agricultural Runoff Model and a more general nonpoint source model. HSPF parametrizes numerous hydrologic and hydrodynamic processes to determine flow rate, sediment, and nutrient loads. HSPF uses continuous meteorological records to create hydrographs and to estimate time series pollution concentrations.[1] The output of the HSPF process is a model of multiple hydrologic response units (HRUs), or subwatersheds of the overall LSRW.

FDCs graphs have flow duration interval (percentage of time flow exceeded) on the X-axis and discharge (flow per unit time) on the Y-axis. The FDC was transformed into a LDC by multiplying individual flow values by the WQS (126 orgs/100 mL) and then multiplying that value by a conversion factor. The resulting points are plotted onto a load duration curve graph. A LDC graph for the LSRW bacteria TMDL, have flow duration interval (percentage of time flow exceeded) on the X-axis and *E. coli* loads (number of bacteria per unit time) on the Y-axis. The LSRW LDC used *E. coli* measurements in billions of bacteria per day. The curved line on a LDC graph represents the TMDL of the respective flow conditions observed at that location.

Water quality monitoring was completed in the LSRW and measured *E. coli* concentrations were converted to individual sampling loads by multiplying the sample concentration by the instantaneous flow measurement observed/estimated at the time of sample collection and then by a conversion factor which allows the individual samples to be plotted on the same figure as the LDC (Figure 16 of the final TMDL document).

The LDC plot was subdivided into five flow regimes; very high flow conditions (exceeded 0–10% of the time), high flow conditions (exceeded 10–40% of the time), mid-range flow conditions (exceeded 40–60% of the time), low flow conditions (exceeded 60–90% of the time), and very low flow conditions (exceeded 90–100% of the time). LDC plots can be organized to display individual sampling loads with the calculated LDC. Watershed managers can interpret LDC graphs with individual sampling points plotted alongside the LDC to understand the relationship between flow conditions and water quality exceedances within the watershed. Individual sampling loads which plot above the LDC represent violations of the WQS and the allowable load under those flow conditions at those locations. The difference between individual sampling loads plotting above the LDC and the LDC, measured at the same flow, is the amount of reduction necessary to meet WQS.

The strengths of using the LDC method are that critical conditions and seasonal variation are considered in the creation of the FDC by plotting hydrologic conditions over the flows measured during the recreation season. Additionally, the LDC methodology is relatively easy to use and cost-effective. The weaknesses of the LDC method are that nonpoint source allocations cannot be assigned to specific

[1] HSPF User's Manual - https://water.usgs.gov/software/HSPF/

sources, and specific source reductions are not quantified. Overall, the MPCA believes and the EPA concurs that the strengths outweigh the weaknesses for the LDC method.

Implementing the results shown by the LDC requires watershed managers to understand the sources contributing to the water quality impairment and which Best Management Practices (BMPs) may be the most effective for reducing bacteria loads based on flow magnitudes. Different sources will contribute bacteria loads under varying flow conditions. For example, if exceedances are significant during high flow events this would suggest storm events are the cause and implementation efforts can target BMPs that will reduce stormwater runoff and consequently bacteria loading into surface waters. This allows for a more efficient implementation effort.

The bacteria TMDL for the LSRW was calculated and those results are found in Table 5 of this Decision Document. The load allocation was calculated after the determination of the WLA, and the Margin of Safety (MOS) (10% of the loading capacity). Load allocations (e.g., stormwater runoff from agricultural land use practices and feedlots, SSTS, wildlife inputs etc.) were not split among individual nonpoint contributors. Instead, load allocations were combined together into a categorical LA ('Watershed Load') to cover all nonpoint source contributions.

Table 5 of this Decision Document reports 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 LDC 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. Table 5 of this Decision Document identifies the loading capacity for the water body at each flow regime. Although there are numeric loads for each flow regime, the LDC is what is being approved for this TMDL (Figure 16 of the final TMDL document).

Table 5: Bacteria (*E. coli*) TMDL for Iosco Creek (-576) in the Le Sueur River Watershed is located at the end of this Decision Document in Attachment 1

Table 5 of this Decision Document communicates the MPCA's estimate of reductions required for streams impaired due to excessive bacteria. Attaining these reduction percentage estimate under the flow conditions which the reductions are prescribed to will allow the impaired segment to meet their water quality targets. This loading reduction (i.e., the percentage column) was estimated from existing and TMDL load calculations. The MPCA expects that this reduction will result in the attainment of the water quality targets and the stream segment's water quality will return to a level where the designated uses are no longer considered impaired.

The EPA concurs with the data analysis and LDC approach utilized by the MPCA in its calculation of loading capacities, wasteload allocations, load allocations and the margin of safety for the LSRW

bacteria TMDLs. The methods used for determining the TMDL are consistent with the EPA's technical memos.[2]

LSRW TP TMDLs: The language of the MPCA RES explains that the RES must be maintained for the long-term summer concentration of TP, when averaged over all flows (Section 2.4.2 of the final TMDL document). MPCA explained that to align with the language of the RES the loading capacity value was based on the seasonal (June 1 to September 30) average of midpoint flows of five equally spaced flow regimes (0% to 20%, 20% to 40%, 40% to 60%, 60% to 80% and 80% to 100%). Selecting the midpoint flow values from these equally spaced flow regimes avoids weighting certain flow regimes more than other flow regimes when calculating the average flow across all flow regimes. The loading capacity was calculated as the average seasonal flow multiplied by the river eutrophication criteria of 150 µg/L (SRNR Ecoregion) (Section 4.5.1 of the final TMDL document).

MPCA estimated the allocations for each of the permitted facilities, the margin of safety, the upstream contributions (if appropriate) and the remainder of the load was attributed to the LA. Load allocations (e.g., stormwater runoff from agricultural land use practices and feedlots, SSTS, wildlife inputs etc.) were not split among individual nonpoint contributors. Instead, these categories were combined into an overall LA (Tables 6-8 of Attachment 2 of this Decision Document).

The EPA supports the data analysis and modeling approach utilized by the MPCA in its calculation of wasteload allocations, load allocations and the margin of safety for the phosphorus TMDLs. Additionally, the EPA concurs with the loading capacity calculated by the MPCA in the phosphorus TMDLs. The EPA finds the MPCA's approach for calculating the loading capacity for the phosphorus TMDLs to be reasonable and consistent with the EPA's guidance.

Tables 6-8: Phosphorus TMDLs for the Le Sueur River Watershed are located at the end of this Decision Document in Attachment 2

The EPA finds that the TMDL document submitted by the MPCA satisfies the requirements of the third criterion.

4. Load Allocations (LA)

The 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.

[2] 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-07-006. Washington, D.C.

The EPA Review of the Le Sueur River TMDL:
The MPCA determined the LA calculations for each of the TMDLs based on the applicable WQS. The MPCA recognized that LAs for each of the individual TMDLs addressed by the LSRW TMDLs can be attributed to different nonpoint sources.

LSRW bacteria TMDL: The calculated LA values for the bacteria TMDL are applicable across all flow conditions in the LSRW (Table 5 in Attachment 1 of this Decision Document). The MPCA identified several nonpoint sources which contribute bacteria loads to the surface waters of the LSRW, including stormwater from agricultural and feedlot areas, failing septic systems, and wildlife. The MPCA did not determine load allocation values for each of these potential nonpoint source considerations but aggregated the nonpoint sources into one "watershed load" LA calculation.

LSRW phosphorus TMDLs: The calculated LA values for the phosphorus TMDLs are applicable across all flow conditions. The MPCA identified several nonpoint sources which contribute phosphorus loads to the impaired segments in the LSRW (Tables 6-8 of Attachment 2 of this Decision Document). Load allocations were recognized as originating from many diverse nonpoint sources including stormwater contributions from agricultural lands, stream channelization and streambank erosion, and upstream lakes. The MPCA did determine load allocation values for the upstream lakes but did not further refine the LA. The remaining LA was aggregated into one "watershed load" LA calculation.

The EPA finds the MPCA's approach for calculating the LAs for bacteria and phosphorus to be reasonable. The EPA finds that the TMDL document submitted by the MPCA satisfies the requirements of the fourth criterion.

5. Wasteload Allocations (WLAs)

The 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.

The EPA Review of the Le Sueur River TMDL:
LSRW bacteria TMDLs: MPCA determined that there are no NPDES-regulated point sources that discharge bacteria in the Iosco Creek watershed. The MPCA acknowledged the presence of CAFOs in the LSRW in Sections 3.7.1.5 of the final TMDL document. CAFOs and other feedlots are generally not allowed to discharge to waters of the State (Minnesota Rule 7020.2003). CAFOs were assigned a WLA of zero (WLA = 0) by the MPCA for the LSRW bacteria TMDL. As explained by the MPCA, CAFO production areas must be designed to contain all manure, and direct precipitation and manure-contaminated runoff from discharging to surface waters during precipitation events up to the 25-year, 24-hour storm event, and even in the event of a discharge, the discharge cannot cause or contribute to

a violation of a WQS. The MPCA noted that any precipitation-caused runoff from the land application of manure where the manure has been land applied at agronomic rates is not considered a point source discharge and is accounted for in the LA section of the TMDL.

The EPA finds the MPCA's approach for calculating the WLAs for the LSRW bacteria TMDL to be reasonable and consistent with the EPA's guidance.

LSRW phosphorus TMDLs: The MPCA identified 13 NPDES permitted facilities impacting the TMDL watersheds (Section 4.5.4.1 of the final TMDL document). Two of the facilities (Pemberton WWTP and Waldorf WWTP) are not authorized to discharge during the TMDL time period (June 1-September 30), and therefore, MPCA did not develop WLAs for these two facilities (Section 3.7.1.1 and Table 9 of the final TMDL document).

For the remaining facilities, MPCA determined the WLAs based upon the potential days a facility could discharge during the critical summer months, as well as the permitted discharge rate and effluent limit (Section 4.5.4.1 of the final TMDL document). For the four mechanical (continuous) systems, MPCA used the full 122 days of the summer critical condition, while for the seven pond (controlled) systems, MPCA utilized the 15 days of allowable discharge.

MPCA noted that the current permits for all facilities in the Le Sueur River Watershed were determined based upon the WLAs contained in the previously approved *Lower Minnesota River Dissolved Oxygen Total Maximum Daily Load Report* (2004), and are therefore protective of both the Le Sueur River and the Lower Minnesota River (Section 4.5.4.1 of the final TMDL document). MPCA determined that one other basin-scale TMDL impacted the Le Sueur River TMDL, the *Lake Pepin and Mississippi River Eutrophication Total Maximum Daily Load Report* (2021). MPCA determined that the WLAs in the Le Sueur River 2025 TMDL are consistent with the WLAs in the *Lake Pepin and Mississippi River Eutrophication Total Maximum Daily Load Report*. See Section 4.5.4.1 of the final TMDL for further discussion.

The MPCA identified seven MS4 permittees discharging to the impaired segments (Table 21 of the final TMDL document). The MPCA assigned a portion of the WLA based upon the areal extent of the MS4 permitted portion of the watershed in the impacted watersheds. Table 21 of the final TMDL document contains the acreage used by the MPCA in determining the WLAs.

The MPCA calculated a WLA for construction and industrial stormwater for the phosphorus TMDLs (Tables 6-8 of Attachment 2 of this Decision Document). This WLA was represented as a categorical WLA for construction and industrial stormwater. The WLA for construction stormwater was calculated based on the average percent area (0.05%) of the LSRW which was covered under a NPDES/SDS Construction Stormwater General Permit during the previous five years (Section 4.5.4.3 of the final TMDL document). The construction and industrial stormwater WLAs were calculated as the percent area (0.05%) multiplied by the loading capacity.

Construction and industrial sites are expected to create SWPPPs which summarize how stormwater pollutant discharges will be minimized from construction and industrial sites. Under the MPCA's

Stormwater General Permit (MNR100001) and applicable local construction stormwater ordinances, managers of sites under construction or industrial stormwater permits must review the adequacy of local SWPPPs to ensure that each plan complies with the applicable requirements in the State permits and local ordinances. As noted above, the MPCA has explained that meeting the terms of the applicable permits will be consistent with the WLAs set in the phosphorus TMDLs for LSRW. In the event that the SWPPP does not meet the WLA, the SWPPP will need to be modified within 18-months of the approval of the TMDL by the EPA.

The EPA finds the MPCA's approach for calculating the WLAs for the LSRW phosphorus TMDLs to be reasonable and consistent with the EPA's guidance. The EPA finds that the TMDL document submitted by the MPCA satisfies the requirements of the fifth criterion.

6. Margin of Safety (MOS)

The Clean Water Act, § 303(d)(1)(c), and 40 C.F.R. 130.7 (c)(1) require that a TMDL include a margin of safety (MOS) "which takes into account any lack of knowledge concerning the relationship between effluent limitations and water quality." The 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. The MOS may include both explicit and implicit components.

The EPA Review of the Le Sueur River TMDL:
The final TMDL submittal outlines the determination of the Margin of Safety for the bacteria and phosphorus TMDLs.

LSRW bacteria TMDL: The LSRW bacteria TMDL incorporates a 10% explicit MOS applied to the total loading capacity calculation for each flow regime of the LDC. Ten percent of the total loading capacity was reserved for MOS with the remaining load allocated to point and nonpoint sources (Table 5 of Attachment 1 of this Decision Document). The MPCA explained that the explicit MOS was set at 10% due to the following factors discovered during TMDL development for these pollutants:

- Uncertainty in simulated flow data from the HSPF model;
- Environmental variability in pollutant loading and water quality data (i.e., collected water quality monitoring data, field sampling error, etc.); and
- Calibration and validation processes of the LDC modeling efforts, uncertainty in modeling outputs, and conservative assumptions made during the modeling efforts.

Challenges associated with quantifying *E. coli* loads include the dynamics and complexity of bacteria in stream environments. Factors such as die-off and re-growth contribute to general uncertainty that makes quantifying stormwater bacteria loads particularly difficult. The MOS for the LSRW bacteria TMDL also incorporates certain conservative assumptions in the calculation of the TMDL. 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. The MPCA determined that it was more conservative to use the WQS (126 orgs/100 mL) and not to apply a rate of decay, which could result in a discharge limit greater than the WQS.

As stated in the *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 to meet the WQS of 126 orgs/100 mL. Thus, it is more conservative to apply the State's WQS as the bacteria target value because this standard must be met at all times under all environmental conditions.

LSRW phosphorus TMDLs: The phosphorus TMDLs for LSRW used an explicit MOS for the three river segments (Tables 6-8 of Attachment 1 of this Decision Document; Section 4.5.2 of the final TMDL document). The MPCA utilized an explicit MOS of 5% to account for any uncertainties in the HSPF model and the robust water quality and flow data utilized in the high quality model utilized in the development of the TMDLs (Section 4.5.2 of the final TMDL document).

MPCA explained that the HSPF model for the Le Sueur River watershed was initially developed in 2002 and revised in 2014 to more accurately characterize flows that informed the 2015 Le Sueur River Watershed TMDL. The HSPF model was refined yet again in 2019 and 2023 as part of the Le Sueur River Watershed 2025 TMDL. As a result of the ongoing model revisions and updates, MPCA determined that the model was an accurate representation of the river system, and a 5% MOS was appropriate.

The EPA finds that the TMDL document submitted by the MPCA contains an appropriate MOS satisfying the requirements of the sixth criterion.

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)).

The EPA Review of the Le Sueur River TMDL:

LSRW bacteria TMDL: Bacterial loads vary by season, typically reaching higher numbers in the dry summer months when low flows and bacterial growth rates contribute to their abundance, and reaching relatively lower values in colder months when bacterial growth rates attenuate and loading events, driven by stormwater runoff events aren't as frequent. Bacterial WQS need to be met between April 1st to October 31st, regardless of the flow condition. The development of the LDCs by MPCA utilized simulated flow data which were validated and calibrated with local flow gage data. Modeled

flow measurements represented a variety of flow conditions from the recreation season. LDCs developed by MPCA from these modeled flow conditions represented a range of flow conditions within the LSRW and thereby accounted for seasonal variability over the recreation season (Section 4.2 of the final TMDL document).

Critical conditions for *E. coli* loading occur in the dry summer months. This is typically when stream flows are lowest, and bacterial growth rates can be high. By meeting the water quality targets during the summer months, it can reasonably be assumed that the loading capacity values will be protective of water quality during the remainder of the calendar year (November through March).

LSRW phosphorus TMDLs: Seasonal variation was considered for the LSRW TMDLs as described in Section 4.2 of the final TMDL document. The nutrient targets employed in the TMDLs were based on the average nutrient values collected during the growing season (June 1 to September 30). The water quality target was designed to meet the WCBP eutrophication WQS during the period of the year where the frequency and severity of algal growth is the greatest.

The Minnesota eutrophication standards state that total phosphorus WQS are defined as the mean concentration of phosphorus values measured during the growing season. In the LSRW phosphorus TMDL effort, the LA and WLA estimates were calculated from modeling efforts which incorporated mean growing season total phosphorus values. Nutrient loading capacities were set in the TMDL development process to meet the WQS during the most critical period. The mid to late summer period is typically when eutrophication standards are exceeded and water quality within the LSRW is deficient. By calibrating the modeling efforts to protect the rivers during the worst water quality conditions of the year, it is assumed by MPCA that the loading capacity established by the TMDL will be protective of water quality during the remainder of the calendar year (October through May).

The EPA finds that the TMDL document submitted by the MPCA satisfies the requirements of the seventh criterion.

8. Reasonable Assurance

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, the 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 the EPA to determine that the TMDL, including the load and wasteload allocations, has been established at a level necessary to implement water quality standards.

The EPA Review of the Le Sueur River TMDL:

The LSRW bacteria and nutrient TMDLs provide reasonable assurance that actions identified in the implementation section of the final TMDL (i.e., Sections 6 and 8 of the final TMDL document), will be applied to attain the loading capacities and allocations calculated for the impaired reaches within the LSRW. The recommendations made by the MPCA will be successful at improving water quality if the appropriate local groups work to implement these recommendations. Those mitigation suggestions, which fall outside of regulatory authority, will require commitment from state agencies and local stakeholders to carry out the suggested actions.

The MPCA has identified several local partners which have expressed interest in working to improve water quality within the LSRW. Implementation practices will be implemented over the next several years. It is anticipated that staff from Soil and Water Conservation District (SWCDs) (e.g., the Blue Earth County, Waseca County, Faribault County, and Freeborn County SWCDs) staff, local Minnesota Board of Water and Soil Resources (BWSR) offices, and other local watershed groups, will work together to reduce pollutant inputs to the LSRW. The MPCA has authored a Le Sueur River WRAPS document (August 2015 and updated in April 2025) which provides information on the development of scientifically supported restoration and protection strategies for implementation planning and action. The MPCA sees the WRAPS document as a starting point for which the MPCA and local partners can develop tools that will help local governments, landowners, and special interest groups determine (1) the best strategies for making improvements and protecting resources that are already in good condition, and (2) focus those strategies in the best places to do work.

County SWCDs, such as those noted above, have a history of implementation efforts in the LSRW. Sections 6.3 and 6.4 of the final TMDL document discusses numerous efforts in the TMDL watershed where local groups have implemented efforts to reduce pollutants. The SWCDs employ various programming, such as shoreline planting programming, native plant, tree and seed planting programming, cost-share opportunities, equipment rentals and other technical services to ensure that efforts are made to improve water quality and conserve water resources in the LSRW. Other county SWCDs in the LSRW has similar programming efforts which locals can utilize. Section 6.3 of the final TMDL document also contains information on the various county-scale watershed plans developed and implemented by the counties in the TMDL watershed that are designed to control and reduce pollutants in the watersheds. This includes the *2021-2026 Blue Earth County SWCD Comprehensive Plan* and *the Blue Earth Water Management Plan 2017-2026*.

Section 6.5 of the final TMDL document describes the previous and ongoing funding made available to landowners in the LSRW. Examples of some of the major funding sources include Watershed-based Implementation Funding (WBIF), Clean Water Fund Competitive Grants (e.g., Projects and Practices), and conservation funds from Natural Resources Conservation Service (NRCS) (e.g., Environmental Quality Incentives Program (EQIP) and Conservation Stewardship Program (CSP)). Figure 20 of the final TMDL document shows the funding amounts and sources per years withing the TMDL watershed. Over $98 million has been spent since 2004 in the watershed.

Continued water quality monitoring within the basin is supported by the MPCA in Section 7.1 of the final TMDL document. Additional water quality monitoring results could provide insight into the success or failure of BMP systems designed to reduce bacteria and nutrient loading into the surface waters of the watershed. Local watershed managers would be able to reflect on the progress of the various pollutant removal strategies and would have the opportunity to change course if observed progress is unsatisfactory.

The MPCA regulates the collection, transportation, storage, processing and disposal of animal manure and other livestock operation wastes at State registered animal feeding operation (AFO) facilities. The MPCA Feedlot Program implements rules governing these activities and provides assistance to counties and the livestock industry. The feedlot rules apply to most aspects of livestock waste management including the location, design, construction, operation and management of feedlots and manure handling facilities.

Reasonable assurance that the WLA set forth will be implemented is provided by regulatory actions. According to 40 CFR 122.44(d)(1)(vii)(B), NPDES permit effluent limits must be consistent with assumptions and requirements of all WLAs in an approved TMDL. The MPCA's stormwater program and the NPDES permit program are the implementing programs for ensuring WLA are consistent with the TMDL. The NPDES program requires construction and industrial sites to create SWPPPs which summarize how stormwater will be minimized from construction and industrial sites. Under the MPCA's Stormwater General Permit, managers of sites under construction or industrial stormwater permits must review the adequacy of local SWPPPs to ensure that each plan meets WLA set in the LSRW TMDLs. In the event that the SWPPP does not meet the WLA, the SWPPP will need to be modified. This applies to sites under the MPCA's General Stormwater Permit for Construction Activity (MNR100001) and its NPDES/SDS Industrial Stormwater Multi-Sector General Permit (MNR050000) or NPDES/SDS General Permit for Construction Sand & Gravel, Rock Quarrying and Hot Mix Asphalt Production facilities (MNG490000).

The Clean Water Legacy Act (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 the 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., the 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 the MPCA to develop 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. The MPCA has developed guidance on what is required in the WRAPS (*Watershed Restoration and Protection Strategy Report Template*, MPCA).

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 (*http://bwsr.state.mn.us/cwf_programs*).

The EPA finds that this criterion has been adequately addressed.

9. Monitoring Plan to Track TMDL Effectiveness

The 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.

The EPA Review of the Le Sueur River TMDL:

The final TMDL document outlines the water monitoring efforts in the LSRW (Section 7 of the final TMDL document). Progress of TMDL implementation will be measured through regular monitoring efforts of water quality and total BMPs completed. The MPCA anticipates that monitoring will be completed by local groups (e.g., the Blue Earth SWCD, Waseca SWCD, Faribault SWCD, and Freeborn SWCD) and volunteers, as long as there is sufficient funding to support the efforts of these local entities. At a minimum, the LSRW will be monitored once every 10 years as part of the MPCA's Intensive Watershed Monitoring cycle.

Water quality monitoring is a critical component of the adaptive management strategy employed as part of the implementation efforts utilized in the LSRW. Water quality information will aid watershed managers in understanding how BMP pollutant removal efforts are impacting water quality. Water quality monitoring combined with an annual review of BMP efficiency will provide information on the success or failure of BMP systems designed to reduce pollutant loading into water bodies of the LSRW. Watershed managers will have the opportunity to reflect on the progress or lack of progress and will have the opportunity to change course if progress is unsatisfactory. Review of BMP efficiency is expected to be completed by the local and county partners.

Stream Monitoring:
River and stream monitoring in the LSRW, has been completed by a variety of organizations (i.e., SWCDs) and funded by Clean Water Partnership Grants, and other available local funds. The MPCA anticipates that stream monitoring in the LSRW should continue in order to build on the current water quality dataset and track changes based on implementation progress. Continuing to monitor water quality and biota scores in the listed segments will determine whether or not stream habitat restoration measures are required to bring the watershed into attainment with water quality standards. At a minimum, fish and macroinvertebrate sampling should be conducted by the MPCA, Minnesota Department of Natural Resources (MDNR), or other agencies every five to ten years during the summer season.

The EPA finds that this criterion has been adequately addressed.

10. Implementation

The 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, the EPA's policy recognizes that other relevant watershed management processes may be used in the TMDL process. The EPA is not required to and does not approve TMDL implementation plans.

The EPA Review of the Le Sueur River TMDL:
The findings from the LSRW TMDLs will be used to inform the selection of implementation activities as part of the Le Sueur River WRAPS process. The purpose of the WRAPS report is to support local working groups and jointly develop scientifically supported restoration and protection strategies to be used for subsequent implementation planning.

The TMDL outlined some implementation strategies in Section 8 of the final TMDL document. The MPCA outlined the importance of prioritizing areas within the LSRW, education and outreach efforts with local partners, and partnering with local stakeholders to improve water quality within the watershed. The LSRW WRAPS document (April 2025) includes additional detail regarding specific recommendations from the MPCA to aid in the reduction of bacteria and nutrients to surface waters of the LSRW. Additionally, the MPCA referenced the Statewide Nutrient Reduction Strategy (https://www.pca.state.mn.us/water/nutrient-reduction-strategy) for focused implementation efforts targeting phosphorus nonpoint sources in LSRW. The reduction goals for the bacteria and nutrient TMDLs may be met via components of the following strategies:

LSRW bacteria and phosphorus TMDLs:
Pasture management/livestock exclusion plans: Reducing livestock access to stream environments will lower the opportunity for direct transport of bacteria and nutrients to surface waters. The installation

of exclusion fencing near stream and river environments to prevent direct access for livestock, installing alternative water supplies, and installing stream crossings between pastures, would work to reduce the influxes of pollutants and improve water quality within the watershed. Additionally, introducing rotational grazing to increase grass coverage in pastures, and maintaining appropriate numbers of livestock per acre for grazing, can also aid in the reduction of pollutant inputs.

Manure Collection and Storage Practices: Manure has been identified as a source of bacteria and nutrients. These pollutants can be transported to surface water bodies via stormwater runoff. Pollutant laden water can also leach into groundwater resources. Improved strategies for the collection, storage and management of manure can minimize impacts of bacteria and nutrients entering the surface and groundwater system. Repairing manure storage facilities or building roofs over manure storage areas may decrease the amount of pollutants in stormwater runoff.

Manure management plans: Developing manure management plans can ensure that the storage and application rates of manure are appropriate for land conditions. Determining application rates that take into account the crop to be grown on that particular field and soil type will ensure that the correct amount of manure is spread on a field given the conditions. Spreading the correct amount of manure will reduce the availability of bacteria and nutrients to migrate to surface waters.

Feedlot runoff controls: Treatment of feedlot runoff via diversion structures, holding/storage areas, and stream buffering areas can all reduce the transmission of bacteria and nutrients to surface water environments. Additionally, cleaner stormwater runoff can be diverted away from feedlots so as to not liberate pollutants.

Septic Field Maintenance: Septic systems are believed to be a source of nutrients and bacteria to LSRW. Failing systems are expected to be identified and addressed via upgrades to those SSTS not meeting septic ordinances. The MPCA explained that SSTS improvement priority should be given to those failing SSTS adjacent to streams within the watersheds. The MPCA aims to greatly reduce the number of failing SSTS in the future via local septic management programs and educational opportunities. Educating the public on proper septic maintenance, finding and eliminating illicit discharges, and repairing failing systems could lessen the impacts of septic derived nutrient and bacteria inputs into the LSRW.

Stormwater wetland treatment systems: Constructed wetlands with the purpose of treating wastewater or stormwater inputs could be explored in selected areas of the LSRW. Constructed wetland systems may be vegetated, open water, or a combination of vegetated and open water. The MPCA explained that recent studies have found that the more effective constructed wetland designs employ large treatment volumes in proportion to the contributing drainage area, have open water areas between vegetated areas, have long flow paths and a resulting longer detention time, and are designed to allow few overflow events.

Riparian Area Management Practices: Protection of streambanks within the watershed through planting of vegetated/buffer areas with grasses, legumes, shrubs or trees will mitigate pollutant inputs

into surface waters. These areas will filter stormwater runoff before the runoff enters the main stem or tributaries of the LSRW.

Bioinfiltration of stormwater: Biofiltration practices rely on the transport of stormwater and watershed runoff through a medium such as sand, compost or soil. This process allows the medium to filter out sediment and therefore sediment-associated bacteria and nutrients. Biofiltration/bioretention systems, are vegetated and are expected to be most effective when sized to limit overflows and designed to provide the longest flow path from inlet to outlet.

The EPA finds that this criterion has been adequately addressed. The EPA reviews but does not approve implementation plans.

11. Public Participation

The 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, the EPA has explained that final TMDLs submitted to the 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 the EPA establishes a TMDL, the EPA regulations require the 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 the EPA determines that a State/Tribe has not provided adequate public participation, the EPA may defer its approval action until adequate public participation has been provided for, either by the State/Tribe or by the EPA.

The EPA Review of the Le Sueur River TMDL:

The public participation section of the TMDL submittal is found in Section 9 of the final TMDL document. Throughout the development of the LSRW TMDLs the public was given various opportunities to participate. As part of the strategy to communicate the goals of the TMDL project and to engage with members of the public, the MPCA worked with county and SWCD staff in the LSRW to promote water quality, to gain input from landowners via surveys and interviews and to better understand the social dynamics of stakeholders in the LSRW. The MPCA's goal was to create civic engagement and discussion which would enhance the content of the TMDL, WRAPS and BWSR's One Watershed, One Plan (1W1P) documents.

The MPCA posted the draft TMDL online at (http://www.pca.state.mn.us/water/tmdl) during its public comment period of March 3, 2025 to April 2, 2025. One comment letter was received regarding farm field runoff. The MPCA reviewed the comment submitted, responded appropriately.

The EPA finds that the TMDL document submitted by the MPCA satisfies the 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 the 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 the EPA review and approval. This clearly establishes the State's/Tribe's intent to submit, and the 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.

The EPA Review of the Le Sueur River TMDL:
The EPA received the final Le Sueur River Watershed TMDL document (2025), submittal letter and accompanying documentation from the MPCA on May 8, 2025. The transmittal letter explicitly stated that the final TMDLs referenced in Table 1 of this Decision Document were being submitted to the EPA pursuant to Section 303(d) of the Clean Water Act for the EPA review and approval. The letter clearly stated that this was a final TMDL submittal under Section 303(d) of CWA. The letter also contained the name of the watershed as it appears on Minnesota's 303(d) list, and the causes/pollutants of concern. This TMDL was submitted per the requirements under Section 303(d) of the Clean Water Act and 40 CFR 130.

The EPA finds that the TMDL transmittal letter submitted for the Le Sueur River Watershed TMDLs by the MPCA satisfies the requirements of this twelfth element.

13. Conclusion

After a full and complete review, the EPA finds that the one (1) bacteria TMDL and the three (3) phosphorus TMDLs satisfy all elements for approvable TMDLs. This LSRW TMDL approval is for **four TMDLs,** addressing segments for aquatic recreational and aquatic life use impairments (Table 1 of this Decision Document). This TMDL decision also revokes and replaces the previous phosphorus TMDL for the Little Cobb River (-504).

The EPA's approval of these TMDLs extends to the water bodies which are identified above with the exception of any portions of the water bodies that are within Indian Country, as defined in 18 U.S.C. Section 1151. The EPA is taking no action to approve or disapprove TMDLs for those waters at this time. The EPA, or eligible Indian Tribes, as appropriate, will retain responsibilities under the CWA Section 303(d) for those waters.

ATTACHMENTS

Attachment #1: Table 5: Bacteria (*E. coli*) TMDL for the Le Sueur River Watershed TMDL Report (2025)

Attachment #2: Tables 6-8: TP TMDLs for the Le Sueur River Watershed TMDL Report (2025)

ATTACHMENT #1

Table 5: Iosco Creek (07020011-576) *E. coli* TMDL summary.

- Numeric standard used to calculate TMDL: geometric mean of 126 org/100 mL
- TMDL and allocations apply Apr-Oct

TMDL parameter	TMDL *E. coli* load (billion org/day) by flow zone				
	Very high	High	Mid	Low	Very low
Total LA	492	158	56.6	15.4	*
Margin of Safety (MOS)	54.7	17.5	6.29	1.71	*
TMDL	547	175	62.9	17.1	*
Maximum monthly geometric mean (org/100 mL)	1,442				
Estimated percent reduction	91%				

* The median flow for the very low flow zone is zero. The allocations for this flow zone are expressed as an equation rather than an absolute number: allocation = (flow contribution from a given source) x 126 org/100 mL.

ATTACHMENT #2

Table 6. Le Sueur River (07020011-501) TP TMDL summary.

- Numeric standard used to calculate TMDL: 150 µg/L TP
- TMDL and allocations apply June 1 through September 30

TMDL parameter		TMDL TP load (lbs/day)
WLA[4]	Amboy WWTP[1] (MN0022624)	1.50
	Delavan WWTP[1] (MNG585109)	0.83
	Freeborn WWTP[1] (MNG585018)	0.50
	Good Thunder WWTP[1] (MNG585206)	1.45
	Hartland WWTP[1] (MNG585102)	0.81
	Janesville WWTP[1] (MNG585025)	3.51
	Mapleton WWTP[1] (MNG585089)	3.68
	New Richland WWTP[1] (MN0021032)	3.15
	Saint Clair WWTP[1] (MN0024716)	1.12
	Waseca WWTP[1] (MN0020796)	10.82
	Wells Public Utilities WWTP[1] (MN0025224)	15.96
	Mankato Township MS4 (MS400297)[2]	9.28
	Mankato City MS4 (MS400226)[2]	1.62
	Eagle Lake City MS4 (MS400284)[2]	1.07
	South Bend Township MS4 (MS400299)[2]	0.85
	Waseca City MS4 (MS400258)[2]	0.35
	MnDOT ROW MS4 (MS400180)[2]	0.07
	Blue Earth County ROW MS4 (MS400276)[2,5]	0.01
	Construction stormwater[2]	0.29
	Industrial stormwater[2]	0.29
	Total WLA	57.16
Boundary Condition (Eagle, Elysian, Freeborn, Lura, Madison Lakes)		21.70
Margin of Safety (MOS)		37.86
Reserve Capacity (RC)		1.23
Total LA[2]		639.26
TMDL		757.21
Existing summer mean TP concentration (µg/L)[3]		432
Estimated percent reduction[3]		65%

[1] Existing NPDES/SDS TP limits are sufficient to ensure compliance with these WLAs

[2] The daily WLAs for MS4s, construction and industrial stormwater, and the total LA (i.e., nonpermitted watershed runoff) equate to a mean summer TP runoff concentration target of 141 µg/L. This target is for the outlet of Reach 501 and therefore includes losses of phosphorus in the impaired reach and stream network upstream of the impaired reach (see sections 3.7.2.1 and 8.1.3 for further discussion)

[3] Water quality monitoring station(s) used to estimate reductions: S000-340

[4] WLAs for Pemberton WWTF and Waldorf WWTF were not developed for this TMDL because they are not authorized to discharge from June 1 through September 30 (see Section 3.7.1.1)

[5] Blue Earth County MS4 is not a significant contributor to the impairment in Reach 501, see Appendix C

Table 7. Cobb River (07020011-556) TP TMDL summary.

- Numeric standard used to calculate TMDL: 150 µg/L TP
- TMDL and allocations apply June 1 through September 30

TMDL parameter		TMDL TP load (lbs/day)
WLA[4]	Freeborn WWTP[1] (MNG585018)	0.50
	Mapleton WWTP[1] (MNG585089)	3.68
	Construction stormwater[2]	0.09
	Industrial stormwater[2]	0.09
	Total WLA	4.36
Boundary Condition (Freeborn Lake)		3.18
Margin of Safety (MOS)		10.50
Reserve Capacity (RC)		0.26
Total LA[2]		191.70
TMDL		210.00
Existing summer mean TP concentration (µg/L)[3]		308
Estimated percent reduction[3]		51%

[1] Existing NPDES/SDS TP limits are sufficient to ensure compliance with these WLAs

[2] The daily WLAs for construction and industrial stormwater and the total LA (i.e., nonpermitted watershed runoff) equate to a mean summer TP runoff concentration target of 141 µg/L. This target is for the outlet of Reach 556 and therefore includes losses of phosphorus in the impaired reach and stream network upstream of the impaired reach (see Section 3.7.2.1 further discussion)

[3] Water quality monitoring station(s) used to estimate reductions: S003-446

[4] WLAs for Pemberton WWTF and Waldorf WWTF were not developed for this TMDL because they are not authorized to discharge from June 1 through September 30 (see Section 3.7.1.1)

Table 8. Little Cobb River (07020011-504) TP TMDL summary.

- Numeric standard used to calculate TMDL: 150 µg/L TP
- TMDL and allocations apply June 1 through September 30

TMDL parameter		TMDL TP load (lbs/day)
WLA	Construction stormwater[1]	0.04
	Industrial stormwater[1]	0.04
	Total WLA	0.08
Margin of Safety (MOS)		4.26
Reserve Capacity (RC)		0.10
Total LA[1]		80.84
TMDL		85.28
Existing summer mean TP concentration (µg/L)[2]		187
Estimated percent reduction[3]		20%

[1] The daily WLAs for construction and industrial stormwater and the total LA (i.e., nonpermitted watershed runoff) equate to a mean summer TP runoff concentration target of 141 µg/L. This target is for the outlet of Reach 504 and therefore includes losses of phosphorus in the impaired reach and stream network upstream of the impaired reach (see Section 3.7.2.1 further discussion).

[2] Water quality monitoring station(s) used to estimate reductions: S003-574.