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

OCT 17 2018

REPLY TO THE ATTENTION OF:

WW-16J

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

Dear Mr. Skuta:

The U.S. Environmental Protection Agency has conducted a complete review of the final Total Maximum Daily Loads (TMDLs) for sixteen waterbodies in the St. Louis River watershed, including supporting documentation and follow up information. The St. Louis River watershed is located in St. Louis, Carlton, Aitkin and Itasca Counties, Minnesota. The TMDLs were calculated for *E. coli*, total suspended solids, total phosphorus, and temperature to address the impaired aquatic recreation and aquatic life uses.

EPA has determined that these 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 sixteen TMDLs in the St. Louis 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 addressing aquatic recreational and aquatic life uses, and look forward to future 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,

Linda Holst

Linda Holst
Acting Director,
Water Division

Enclosure

cc: Celine Lyman, MPCA
Mike Kennedy, MPCA

wq-iw10-12g

TMDL: St. Louis River Watershed TMDL, St. Louis, Carlton, Aitkin and Itasca Counties, MN
Date:

DECISION DOCUMENT FOR THE ST. LOUIS RIVER WATERSHED TMDLS; ST. LOUIS, CARLTON, AITKIN, AND ITASCA COUNTIES, MN

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

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

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

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

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

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

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

Comment:

Location Description/Spatial Extent:

The St. Louis River watershed is located in St. Louis, Carlton, Aitkin and Itasca Counties, Minnesota, in the northeast portion of Minnesota. The St. Louis River begins in St. Louis and Lake Counties, and flows southwest, then southeast to Lake Superior at Duluth, Minnesota. The TMDL addresses eleven streams impaired for bacteria, two streams impaired for total suspended solids (TSS), one stream for temperature, and two lakes impaired for TP. MPCA determined that West Two River is impaired for dissolved oxygen swings due to excessive phosphorus from West Two River Reservoir. A separate TMDL was not calculated for West Two River, the river will be addressed by the TMDL for the West River Reservoir (Section 3.5.3 of the TMDL).

Several other waterbodies in the watershed are also impaired, mainly due to fish and macroinvertebrate impairments (Tables 1 and 2 of the TMDL). MPCA developed a Stressor Identification Report for the St. Louis River watershed, which determined that many of these biological impairments were not pollutant-based, or needed further analysis (Section 1.4 of the TMDL). Therefore, MPCA has deferred development of TMDLs for these waters until further work can be done.

Table 1 of this Decision Document identifies the waterbodies addressed in this TMDL. The physical characteristics of the lakes are in Table 2 of this Decision Document, and information on the impaired rivers/creeks are in Table 3 of this Decision Document.

Table 1: Waterbodies Addressed by the St. Louis River Watershed TMDLs (HUC 04010201-###)

Listed Waterbody Name	Reach (AUID)	Designated Use Class	Bacteria	Phosphorus	TSS	Temperature
Barber Creek (East Swan River)	569	Aquatic Recreation	X			
Barber Creek (East Swan River)	641	Aquatic Recreation	X			
Buhl Creek	580	Aquatic Recreation	X			
Dempsey Creek	582	Aquatic Recreation	X			
East Swan River	558	Aquatic Life			X	
Hay Creek	751	Aquatic Recreation	X			
Penobscot Creek	936	Aquatic Recreation	X			
Pine River (White Pine River)	543	Aquatic Recreation	X			
Stony Creek	963	Aquatic Life			X	
Unnamed Creek	542	Aquatic Recreation	X			
Unnamed creek (also known as West Rocky Run)	625	Aquatic Recreation	X			
Unnamed creek	A22	Aquatic Recreation	X			
Unnamed creek (East Swan Creek)	888	Aquatic Recreation	X			
West Two River*	535	Aquatic Life		X*		
Wyman Creek	942	Aquatic Life				X
Lakes						
Dinham Lake	69-0544-00	Aquatic Recreation		X		
West Two Rivers Reservoir	69-0994-00	Aquatic Recreation		X		

* - Will be addressed by the TMDL for West Two River Reservoir

Table 2: Lake Physical Characteristics

	Dinham Lake	West Two River Reservoir
Watershed Area (ac)	4569	19938
Surface Area (ac)	200	726
Mean Depth (m)	3.7	3.6
Max Depth (m)	7.5	8.2
Watershed ratio	23:1	27:1
Littoral Area %	63	70

Table 3: Impaired River/Creek information

Watershed	Listed Waterbody Name	Reach (AUID)	Watershed Area (ac)
Swan River-Hibbing	Barber Creek (East Swan River)	569	30451
	Barber Creek (East Swan River)	641	23910
	Buhl Creek	580	4598
	Dempsey Creek	582	22955
	East Swan River	558	94536
	Penobscot Creek	936	2982
	Unnamed Creek	542	5142
	Unnamed Creek	A22	2286
	Unnamed Creek (East Swan Creek)	888	10997
West Two River	West Two River	535	26434
Partridge River	Wyman Creek	942	7075
Stony Creek	Stony Creek	963	15158
Pine River	Pine River	543	29764
Midway River	Unnamed Creek/West Rocky Run	625	5781
	Hay Creek	751	7788

Land Use:
The St. Louis River TMDL watersheds are a mixture of forest (43%), and wetlands (36%), with some barren (mining) land (8%) (Section 3.4 of the TMDL). Land use information for each TMDL reach is found in Table 10 of the TMDL. MPCA does not anticipate changes in bacteria, TSS, or phosphorus loading due to changes in land use within the watersheds. MPCA does not expect significant growth in the watershed.

Problem Identification:
All the waterbodies were placed on the MPCA 303(d) list of impaired waters in 2012. The segments were placed on the MPCA 303(d) list of impaired waters due to exceedances of the *E. coli*, phosphorus, temperature, and TSS criteria. Section 3.5 of the TMDL summarizes the data used to assess the waterbodies, and indicates that at least one value per observation per month in the recreational season exceeds the *E. coli* criteria, as well as the exceedences of the TSS criteria.

Wyman Creek (-942) is impaired due to DO exceedences as a result of high temperatures. MPCA performed a detailed monitoring survey of Wyman Creek in 2016, and determined that DO levels did not meet the DO criterion of 7.0 mg/L. MPCA also noted that the daily changes in DO levels was approximately 5.0 mg/L, greater than the 3.0 mg/L allowed. The monitoring effort determined that excess nutrients were not the cause of the DO impairment; warm water discharged from mining pits, as well as ponding from culverts and beaver dams was slowing water flow and allowing the water to heat up and contain less DO (Section 3.5.4 of the TMDL).

Water quality in Dinham Lake and West Two River Reservoir exceeded the TP criterion. The average TP concentration in Dinham Lake was 36 ug/L. The lake also had average concentrations of 20 ug/L for chlorophyll-a (chl-a), and 1.3 m for Secchi depth. The criteria for Dinham Lake are TP $\leq$ 30 ug/L, chl-a $\leq$ 9 ug/L, and Secchi depth $\geq$ 2.0 m. The average TP concentration in West Two River Reservoir was 40 ug/L. The lake also had average concentrations of 15 ug/L for chlorophyll-a (chl-a), and 1.7 m for Secchi depth. The criteria for West Two River Reservoir are TP $\leq$ 30 ug/L, chl-a $\leq$ 9 ug/L, and Secchi depth $\geq$ 2.0 m.

Pollutants of Concern:
The pollutants of concern are *E. coli*, TP, temperature, and TSS.

Pollutants:
E. coli: Bacteria exceedances can negatively impact recreational uses (fishing, swimming, wading, boating, 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.

Total phosphorus: While TP is an essential nutrient for aquatic life, elevated concentrations of TP can lead to nuisance algal blooms that negatively impact aquatic life and recreation (swimming, boating, fishing, etc.). Algal decomposition depletes oxygen levels which stresses benthic macroinvertebrates and fish. 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. Furthermore, depletion of oxygen can cause phosphorus release from bottom sediments (i.e. internal loading).

Degradations in aquatic habitats or water quality (ex. low dissolved oxygen) can negatively impact aquatic life use. Increased algal growth, brought on by elevated levels of nutrients within the water column, can reduce dissolved oxygen in the water column, and cause large shifts in dissolved oxygen and pH throughout the day. Shifting chemical conditions within the water column may stress aquatic biota (fish and macroinvertebrate species). In some instances, degradations in aquatic habitats or water quality have reduced fish populations or altered fish communities from those communities supporting sport fish species to communities which support more tolerant rough fish species.

TSS: TSS is a measurement of the sediment and organic material that inhibits natural light from penetrating the surface water column. Excessive sediment and organic material within the water column can negatively impact fish and macroinvertebrates within the ecosystem. Excess sediment and organic material may create turbid conditions within the water column and may increase the costs of treating surface waters used for drinking water or other industrial purposes (ex. food processing).

Excessive amounts of fine sediment in stream environments can degrade aquatic communities. Sediment can reduce spawning and rearing areas for certain fish species. Excess suspended sediment can clog the gills of fish, stress certain sensitive species by abrading their tissue, and thus reduce fish health. When in suspension, sediment can limit visibility and light penetration which may impair foraging and predation activities by certain species.

Excess siltation and flow alteration in streams impacts aquatic life by altering habitats. Excess sediment can fill pools, embed substrates, and reduce connectivity between different stream habitats. The result is a decline in habitat types that, in healthy streams, support diverse macroinvertebrate communities. Excess sediment can reduce spawning and rearing habitats for certain fish species.

Temperature: The Clean Water Act includes temperature as a pollutant. Variations from natural temperatures can result in degradation of habitat for aquatic life use. Excessive temperatures can impact the amount of dissolved oxygen that water can contain. DO levels are typically higher in colder water. At higher temperatures and lower DO levels, cold water species such as brook trout have reduced life expectancies and reduced spawning capabilities.

Source Identification (point and nonpoint sources):

Bacteria:

Point Source Identification:

MPCA identified two Wastewater Treatment Plants (WWTP) discharging to two bacteria-impaired watersheds (Table 24 of Section 5 of this Decision Document). MPCA also identified several Municipal Separate Storm Sewer Systems (MS4) in several watersheds. Table 25 of Section 5 of this Decision Document identifies the MS4 permittees in the watersheds. Stormwater from MS4s can transport bacteria to surface water bodies during or shortly after storm events. MPCA explained that three municipalities are expected to meet the requirements for a MS4 permit in the near future, and therefore calculated an allocation for the future permittees (Section 4.1.1 of the TMDL).

Combined Sewer Overflows (CSOs): There are no CSO communities in the St. Louis River watersheds.

Confined Animal Feeding Operations (CAFOs): No CAFOs were identified in the watershed.

Nonpoint Source Identification: The potential bacteria nonpoint sources for the St. Louis River watershed TMDLs are:

Non-regulated stormwater runoff: Non-regulated stormwater runoff can add bacteria to the waterbodies. Runoff from urban areas (urban, residential, commercial or industrial land uses) can contribute bacteria to local water bodies. Stormwater from urban areas, which drain impervious surfaces, may introduce bacteria (derived from wildlife or pet droppings) to surface waters.

Stormwater from feedlots near surface waters: Animal Feeding Operations (AFOs) are generally defined as smaller animal operations that are not regulated under NPDES. AFOs in close proximity to surface waters can be a source of bacteria to water bodies in the St. Louis River watersheds. 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 watersheds. However, MPCA noted that there is very little agricultural land in the watersheds, so loading from agricultural lands is expected to be slight. MPCA provided information on livestock numbers in the watersheds (Table 44 of the TMDL).

Wildlife: Wildlife is a known source of bacteria and phosphorus 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. Wildlife contributes to the potential impact of contaminated runoff from animal habitats, such as park areas, forest, and rural areas.

Failing septic systems: MPCA noted that failing septic systems, where waste material can pond at the surface and eventually flow into the waterbodies or be washed in during precipitation events, are potential sources of *E. coli*. MPCA contacted the local county health departments, and they provided estimates on septic systems in the watersheds. MPCA determined that while there are septic systems in use in the watersheds, failing septic systems are an unlikely source of bacteria in the watersheds (Section 3.6.1 and Table 43 of the TMDL).

TSS:

Point Source Identification:

MPCA identified two WWTPs discharging to the East Swan Creek TSS-impaired watershed (Table 26 of Section 5 of this Decision Document). MPCA also identified one MS4 in the East Swan Creek watershed (558), The City of Hibbing MS4 (Table 26 of Section 5 of this Decision Document). Stormwater from MS4s can transport sediment to surface water bodies during or shortly after storm events. MS4s are considered by MPCA to be a significant source of TSS in the East Swan Creek watershed.

Stormwater runoff from permitted construction areas: Construction may contribute sediment via stormwater runoff during precipitation events. These areas within the two TSS-impaired watersheds must comply with the requirements of the MPCA's NPDES Stormwater Program. The NPDES program requires construction sites to create a Stormwater Pollution Prevention Plan (SWPPP) that summarizes how stormwater will be minimized from the site.

Stormwater runoff from permitted industrial sites: MPCA identified discharges from permitted industrial sites in the two TSS-impaired watersheds as potential sources of TSS. The allocations are for sites regulated under the Industrial Stormwater Multi-Sector Permit (MNR050000) and the General Permit for Nonmetallic Mining and Associated Activities (MNG490000). Allocations were not developed for the Hibbing Taconite Company (MN0001465), which has several outfalls from mine dewatering pits. Discharges from the Hibbing Taconite Company are not considered significant sources of TSS by MPCA (Section 4.2.1 of the TMDL)

Non-Point Source Identification:

Stream channelization and streambank erosion: Eroding stream banks and channelization efforts may add sediment to local surface waters. 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 stream bed 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. Unrestricted livestock access to streams and streambank areas may lead to streambank degradation and sediment additions to stream environments. Although not quantified, MPCA believes the channel erosion contribution is significant in the East Swan Creek watershed, and the dominant TSS source in the Stony Creek watershed.

Upland erosion: During the modeling process, MPCA determined that erosion from upland sources contributes a minor amount of TSS to East Swan Creek and Stony Creek (Section 3.6.2 of the TMDL). The limited agricultural land in the watersheds suggests that field run-off is not a significant contributor of TSS to the two creeks.

Phosphorus:

Point Source Identification: MPCA determined that there are two point sources discharging to the West Two Rivers Reservoir, and no point sources discharging to Dinham Lake (Section 4.3 of the TMDL). The Mountain Iron WWTP (MN0040835) is located in the watershed. The US-

Steel Minntac Mining Area (MN0052493) is located in the subwatershed as well. This permit regulates mine dewatering discharges in the watershed. No CAFOs or CSOs were identified in the West Two Rivers Reservoir watershed. No point sources other than potential construction general permits were identified in the Dinham Lake watershed.

Stormwater runoff from permitted construction areas: Construction may contribute sediment via stormwater runoff during precipitation events. These areas within the two TP-impaired watersheds must comply with the requirements of the MPCA's NPDES Stormwater Program. The NPDES program requires construction sites to create a SWPPP that summarizes how stormwater will be minimized from the site.

Stormwater runoff from permitted industrial sites: MPCA identified discharges from permitted industrial sites in the two TP-impaired watersheds as potential sources of TP. The allocations are for sites regulated under the Industrial Stormwater Multi-Sector Permit (MNR050000) and the General Permit for Nonmetallic Mining and Associated Activities (MNG490000). Allocations were also developed for the US-Steel Minntac Mining Area (surface discharge 17) (MN0052493). Both the construction and industrial activities are not considered significant sources of TP by MPCA (Section 4.3.1 of the TMDL)

Non-Point Source Identification: The potential nonpoint sources for the West Two River Reservoir and Dinham Lake watershed phosphorus TMDLs are:

Stormwater runoff from land use practices: Runoff from wetlands and forest lands may contain significant amounts of nutrients, organic material and organic-rich sediment which may lead to impairments in the lake watersheds. Phosphorus, organic material and organic-rich sediment may be added via surface runoff from upland areas. MPCA noted that there is very limited agricultural land within the two watersheds.

Failing septic systems: MPCA noted that failing septic systems, where waste material can pond at the surface and eventually flow into the waterbodies or be washed in during precipitation events, are potential sources of phosphorus. MPCA contacted the local county health departments; they provided data on septic systems in the watershed. Failing septic systems were determined to be a potential source of TP in Dinham Lake. Very few cabins were present near West Two River Reservoir, so MPCA determined septic systems were not a source of TP to the lake (Section 3.6.3 of the TMDL.

Atmospheric deposition: Phosphorus may be added via particulate deposition. Particles from the atmosphere may fall onto lake surfaces or other surfaces within the watersheds. Phosphorus can be bound to these particles which may add to the phosphorus inputs to surface water environments.

Internal loading: The release of phosphorus from lake sediments via physical disturbance from benthic fish (rough fish, ex. carp) and from wind mixing the water column may all contribute internal phosphorus loading to the lake. Phosphorus may build up in the bottom waters of the lake and may be resuspended or mixed into the water column when the thermocline decreases and the lake water mixes (Section 3.6.3 of the TMDL). MPCA utilized the modeling effort to estimate the potential for internal loading to the two lakes. West Two Rivers Reservoir was determined to have significant internal loading of TP, while Dinham Lake showed little impact from internal loading of TP.

Future Growth:
MPCA expects little change in the allocations between point and nonpoint sources. There may be changes in allocations as land is annexed. These changes will be addressed in the MS4 permit, and any changes in allocations will need to comply with the respective WLA and LA values calculated in the TMDLs.

Priority Ranking:
The water bodies addressed by the St. Louis River TMDLs were given a priority ranking for TMDL development due to: the impairment impacts on public health and aquatic life, the public value of the impaired water resource, the likelihood of completing the TMDL in an expedient manner, the inclusion of a strong base of existing data, the restorability of the water body, the technical capability and the willingness of local partners to assist with the TMDL, and the appropriate sequencing of TMDLs within a watershed or basin. Water quality degradation has led to efforts to improve the overall water quality within the St. Louis River watershed, and to the development of TMDLs for these water bodies. Additionally, MPCA explained that its TMDL development priorities were prioritized to align with its Statewide watershed monitoring approach and its 10-year Watershed Restoration and Protection Strategies (WRAPS) schedule.

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 waterbody, the applicable numeric or narrative water quality criterion, and the antidegradation policy (40 C.F.R. §130.7(c)(1)). EPA needs this information to review the loading capacity determination, and load and wasteload allocations, which are required by regulation.

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

Comment:

Designated Uses:

Minnesota Rule Chapter 7050 designates uses for waters of the state. As noted in Table 4 of this Decision Document, the impaired waters addressed by this TMDL are designated as either Classes 2A or 2B.

Class 2A waters are protected for aquatic life and recreation use described as (boating, swimming, fishing, etc.). The use is described as:

> *"The quality of Class 2A surface waters shall be such as to permit the propagation and maintenance of a healthy community of cold water aquatic biota, and their habitats according to the definitions in subpart 2c. These waters shall be suitable for aquatic recreation of all kinds, including bathing, for which the waters may be usable. This class of surface waters is also protected as a source of drinking water."*

Class 2B waters are protected for aquatic life and recreation use (boating, swimming, fishing, etc.). The Class 2B aquatic life and recreation designated use is described as:

> *"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. "*

While the uses vary for waters in the watershed, the bacteria and TP criteria are the same for the various uses. The TSS criteria do depend upon the designated use as noted below. There is only one waterbody impaired for temperature (DO), Wyman Creek, which is designated a Class 2A water.

Table 4: Use Classifications of TMDL Waterbodies in the St. Louis River Watershed

Use Classification	Waterbody Name	AUID #
2A	Barber Creek (East Swan River)	569
	East Swan River	558
	Penobscot Creek	936
	Unnamed Creek (East Swan Creek)	888
	Wyman Creek	942
	Pine River	543
	Unnamed Creek/West Rocky Run	625
	Hay Creek	751
2B	Barber Creek (East Swan River)	641
	Buhl Creek	580
	Dempsey Creek	582
	Stony Creek	963
	Unnamed Creek	542
	Unnamed Creek	A22
	West Two River	535
	Dinham Lake	69-0544-00
	West Two Rivers Reservoir	69-0994-00

Numeric bacteria criteria:

Through adoption of WQS into Minnesota's administrative rules (principally Chapters 7050 and 7052), MPCA has identified designated uses to be protected in each of its drainage basins and the criteria necessary to protect these uses. The bacteria water quality standards which apply to the *E. coli* impaired waters are:

Table 5: Bacteria Water Quality Standards Applicable in the St. Louis River TMDL

Parameter	Units	Water Quality Standard
E. coli [1]	# / 100 mL	1,260 in < 10% of samples [2]
		Geometric Mean < 126 [3]

[1] = *E. coli* standards apply only between April 1 and October 31
[2] = Standard shall not be exceeded by more than 10% of the samples taken within any calendar month
[3] = Geometric mean based on minimum of 5 samples taken within any calendar month

Target:
The target is the standard as stated above, for both the geometric mean portion and the daily maximum portion, which is applicable from April 1st through October 31st. However, the focus of these TMDLs is on the "chronic" geometric mean standard of 126 cfu/100ml. MPCA determined that utilizing the 126 cfu/100 mL portion of the water quality standard will result in the greatest bacteria reductions within the impaired watersheds, and that the geometric mean is the more relevant value in determining water quality. MPCA stated that while the TMDL will focus on the geometric mean portion of the water quality standard, both parts of the water quality standard must be met.

Numeric phosphorus criteria:
Numeric criteria for total phosphorus, chlorophyll-a (chl-a), and Secchi Disk (SD) depth are set forth in Minnesota Rules 7050.0222. These three parameters are the eutrophication standards that must be achieved to attain the aquatic recreation designated use. The numeric eutrophication standards which are applicable to Dinham Lake and West Twin River Reservoir are those set forth for Class 2B shallow lakes in the Northern Lakes and Forest (NLF) Ecoregion (Table 6 of this Decision Document). In developing the lake nutrient standards for Minnesota lakes, the MPCA evaluated data from a large cross-section of lakes within each of the State's ecoregions. Clear relationships were established between the causal factor, TP, and the response variables, chl-a and SD (Section 2.2 of the TMDL).

Table 6: MPCA Eutrophication Criteria for Lakes in the NLF Ecoregion

Parameter	Eutrophication Standard Shallow Lakes
Total Phosphorus (µg/L)	TP ≤ 30
Chlorophyll-a (µg/L)	chl-a ≤ 9
Secchi Depth (m)	SD ≥ 2.0

Target:
MPCA selected a target of 30 µg/L of TP for the two lakes to develop the nutrient TMDLs. MPCA selected total phosphorus as the appropriate parameter to address eutrophication problems in the lakes because of the interrelationships between TP and chl-a, as well as SD. 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 will decrease water clarity that is measured by SD.

Numeric TSS criteria:
EPA approved MPCA's regionally-based TSS criteria for rivers and streams in 2015. The TSS criteria replaced Minnesota's statewide turbidity criterion. The TSS criteria provide water clarity targets for measuring suspended particles in rivers and streams, and are noted in Table 7 below:

Table 7: TSS criteria for the St. Louis River watershed

Parameter	Water Quality Standard*	Notes
TSS	10 mg/L	Northern River Nutrient Region – for coldwater streams (Class 2A) exceeded less than 10% of the time
	15 mg/L	Northern River Nutrient Region – for warmwater streams (Class 2B) exceeded less than 10% of the time

* Applicable from April 1-September 30.

Targets: MPCA employed the Northern River Nutrient Region TSS criteria of 10 mg/L and 15 mg/L.

Numeric Dissolved Oxygen/Temperature Criteria: Wyman Creek (-942) was listed as impaired due to low dissolved oxygen (DO) levels. Wyman Creek is a coldwater stream (Class 2A), and the DO criteria is no less than 7.0 mg/L at any time. MPCA investigated the cause of the low DO in the St. Louis River Stressor Identification Report (SID), and determined that the cause is elevated temperatures in the creek (Section 3.5.4 of the TMDL). Criteria for temperature for Class 2A waters are set forth in Minnesota Rules 7050.0222. For temperature, the requirement is "no material increase". For Wyman Creek, the SID report focused upon the temperature needs for brook trout. MPCA determined that the temperature needs to be between 7.8 and 20.0° C to support growth (Section 2.2 of the TMDL).

Target: MPCA determined the target for protection of cold-water fish species is 20.0° C. To meet this temperature target, MPCA determine the kilocaloric load[1] per day limit (kcal/day).

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

3. Loading Capacity - Linking Water Quality and Pollutant Sources

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

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

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

[1] A calorie is the approximate amount of energy needed to raise the temperature of one gram of water by one degree Celsius.

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:
Functionally a TMDL is represented by the equation:

$$TMDL = LC = \Sigma WLA + \Sigma LA + MOS + RC,$$

where: LC is the loading capacity; WLA is the wasteload allocation; LA is the load allocation; MOS is the margin of safety; and (pursuant to MPCA rules) RC is any reserve capacity set aside for future growth. MPCA used several approaches for TMDLs in the St. Louis River watershed, all of which used a Hydrologic Simulation Program FORTRAN (HSPF) model to determine flow: (1) A load duration curve (LDC) for the stream segment TMDLs (to determine *E. coli* and TSS loads); (2) an in-stream response model (QUAL2K) to determine DO and temperature responses for Wyman Creek, and (3) a conventional daily load mass balance for the Dinham Lake and West Two Rivers Reservoir (TP) TMDLs. The lake TMDLs applied the BATHTUB model approach using the HSPF spatially relevant hydrologic response unit (HRU) model output as the inflow values. Details on these models, the LDC process, and specifics related to pollutants of concern (including the TMDL tables) can be found in the Decision Document sections below, and in Section 4 and Appendices C and D of the TMDL.

HSPF
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.[2,3] The output of the HSPF process is a model of multiple HRUs, or subwatersheds of the overall St. Louis River watershed. The flow from these HRUs were calibrated to eight different gage sites with up to twelve years of data (2003 through 2012).

***E. coli*:**
The approach utilized by the MPCA to calculate the loading capacity for the *E. coli* TMDLs are described in Section 4.1 of the TMDL.

For the *E. coli* TMDLs, a geometric mean of 126 cfu/100 ml *E. coli* for five samples equally spaced over a 30-day period was used to calculate the loading capacity of the TMDLs. 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

[2] HSPF User's Manual - https://water.usgs.gov/software/HSPF/code/doc/hspfhelp.zip
[3] EPA TMDL Models Webpage - https://www.epa.gov/exposure-assessment-models/tmdl-models-and-tools

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."

MPCA stated that while the bacteria TMDL will focus on the geometric mean portion of the water quality standard (i.e., the chronic WQS of 126 cfu/100mL), attainment of the WQS involves the water body meeting both the chronic (126 cfu/100 mL) and acute (1,260 cfu/100 mL) portions of the water quality standard. 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 St. Louis River watershed 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.

A flow duration curve (FDC) was created for the waterbodies. The FDC was developed from flow data from several monitoring sites in the St. Louis River watershed. Daily stream flows were necessary to implement the load duration curve (LDC) approach. MPCA utilized the flow results from the HSPF model to provide additional input into the LDCs (Section 4.1.1 of the TMDL).

The FDC was transformed into a LDC by multiplying individual flow values by the WQS (126 cfu/100 mL) and then multiplying that value by a conversion factor. The resulting points are plotted onto a load duration curve graph. The LDC graph for the seventeen waterbodies has 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 LDC used *E. coli* measurements in billions of bacteria per day. The curved line on a LDC graph represents the TMDL for the respective flow conditions observed at that location.

E. coli values from the monitoring sites were converted to individual sampling loads by multiplying the sample concentration by the instantaneous flow measurement observed/estimated at the time of sample collection. The individual sampling loads were plotted on the same figure with the LDC (Figures 59-69 of the TMDL).

The LDC plots were subdivided into five flow regimes; very high flows (exceeded 0–10% of the time), high conditions (exceeded 10–40% of the time), mid-range flows (exceeded 40–60% of the time), low conditions (exceeded 60–90% of the time), and very low flows (exceeded 90–100% of the time). LDC plots can be organized to display individual sampling loads and the calculated LDC. Watershed managers can interpret these plots (individual sampling points plotted with 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 sources, and specific source reductions are not quantified. Overall, MPCA believes and 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.

TMDLs for the eleven waterbodies were calculated as appropriate. The regulated permittees discharging *E. coli* have allocations determined for them (Tables 8-18 of this Decision Document). The load allocation was calculated after the determination of the Margin of Safety (10% of the loading capacity). Other load allocations (ex. non-regulated stormwater runoff, wildlife inputs, etc.) were not split amongst individual nonpoint contributors. Instead, load allocations were combined together into a generalized loading. Review of the LDCs indicate that exceedences are occurring under all flow conditions, and therefore control of several source types will be needed. The LDCs demonstrate that reductions ranging from 0%-93% are needed to attain standards.

Tables 8-18 of this Decision Document calculate five points (the midpoints of the designated flow regime) on the loading capacity curves. 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 these TMDLs.

EPA concurs with the data analysis and LDC approach utilized by MPCA in its calculation of loading capacities, wasteload allocations, load allocations and the margin of safety for the bacteria TMDLs. The methods used for determining the TMDL are consistent with EPA technical memos.[4]

TSS:

The approach utilized by the MPCA to calculate the loading capacity for the TSS TMDLs is described in Section 4.2 of the final TMDL.

For the TSS TMDLs, the TSS criteria of 10 mg/L for Class 2A waters and 15 mg/L for Class 2B waters (Table 7 of this Decision Document) were used to calculate the loading capacity of the TMDLs.

The same process was used for the TSS TMDLs as was used for the bacteria TMDLs. A FDC was created for the waterbodies. The FDC was developed from flow data from several monitoring sites in the St. Louis River watershed. Daily stream flows were necessary to implement the load duration curve (LDC) approach. MPCA utilized the flow results from the HSPF model to provide additional input into the LDCs (Section 4.2.1 of the TMDL).

The FDC was transformed into a LDC by multiplying individual flow values by the WQS (10 mg/L or 15 mg/L) and then multiplying that value by a conversion factor. The resulting points are plotted onto a load duration curve graph. The curved line on a LDC graph represents the TMDL for the respective flow conditions observed at that location.

TMDLs for the two waterbodies were calculated as appropriate. The regulated permittees discharging TSS have allocations determined for them (Tables 19-20 of this Decision Document). The load allocation was calculated after the determination of the Margin of Safety (10% of the loading capacity). Other load allocations (ex. non-regulated stormwater runoff, wildlife inputs, etc.) were not split amongst individual nonpoint contributors. Instead, load allocations were combined together into a generalized loading. Review of the LDCs indicate that exceedences are occurring under higher flows, indicating precipitation-related sources are significant contributors to the TSS impairments.

Tables 19-20 of this Decision Document calculate five points (the midpoints of the designated flow regime) on the loading capacity curves. 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 these TMDLs.

***Dissolved Oxygen/Temperature*:**

QUAL2K is a steady state, one-dimensional model that can simulate in-stream water temperatures and DO concentrations on an hourly time step (Section 1 of Appendix D of the TMDL). Typically, daily data is simulated during critical conditions (e.g., low flow and warm

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[4] 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.

temperatures) and iterated over multiple repeated days to achieve convergence. QUAL2K represents streams as a series of segments, each of which has approximately constant characteristics (e.g., slope, shading, bottom width). Each segment is further divided into a series of equally spaced model computational elements, which are assumed fully mixed. Factors that affect in-stream temperature and DO concentrations are represented in QUAL2K, including solar inputs, stream shading, air temperature, oxidation of suspended and dissolved organic matter. The relative magnitude of these factors can be determined through model application, and scenarios can be developed to evaluate if management actions can improve in-stream conditions.

The results of the QUAL2K modeling show that several factors are contributing to the DO impairment. Wyman Creek receives flow from two mining pits, which have relatively high DO levels but also higher temperature levels. Beaver dams are present along much of the middle stretch of Wyman Creek. These dams allow water to slow and stagnate, increasing temperature and losing DO. In addition, the beavers have removed many of the trees immediately along the streambank, decreasing shading of the creek. There is also a culvert in the upper portion of Wyman Creek that restricts flow downstream, allowing water again to stagnate.

The QUAL2K model was used to evaluate several scenarios to meet the WQS (Section 5 of Appendix D of the TMDL). The scenario that attains the DO criteria and the temperature target involves the following modifications:

- Removal of the west braid of Wyman Creek
- Increasing shade along the lowermost reaches of the creek
- Water temperature improvements to the middle of Wyman Creek; this was either increased shade or other implementation to reduce in-stream temperatures.

Further detail on the QUAL2K model can be found in Appendix D of the TMDL.

MPCA then determined the thermal load in kilocalories per day (kcal/day) to attain the temperature target of 20°C. Table 21 of this Decision Document summarizes the temperature TMDL for Wyman Creek.

Total Phosphorus:

MPCA used the U.S. Army Corps of Engineers (USACE) BATHTUB model to calculate the loading capacity for Dinham Lake and West Two Rivers Reservoir (Section 4.3 of the TMDL). BATHTUB is a model for lakes and reservoirs to determine steady-state water and nutrient mass balances in a spatially segmented hydraulic network. BATHTUB uses empirical relationships to determine "eutrophication-related water quality conditions".[5] These TMDLs use the BATHTUB model to link observed phosphorus water quality conditions and modeled phosphorus loading to in-lake water quality estimates. BATHTUB can be a steady-state annual or seasonal model that predicts a lake's water quality. BATHTUB utilizes annual or seasonal time-scales which are appropriate because watershed TP loads are normally impacted by seasonal conditions.

The model estimates in-lake phosphorus concentration by calculating net phosphorus loss (phosphorus sedimentation) from annual phosphorus loads as functions of inflows to the lake, lake depth, and hydraulic flushing rate. To estimate loading capacity the model is rerun, reducing current loading to the lake until the modeled result shows that in-lake total phosphorus

[5] BATHTUB Manual - http://www.wwwalker.net/bathtub/help/bathtubWebMain.html

would meet the applicable WQS.[6] The BATHTUB model also allows MPCA to assess impacts of changes in nutrient loading from the various sources.

The BATHTUB modeling effort was used to calculate the loading capacity for the two lakes. The loading capacity is the maximum phosphorus load which the waterbody can receive over an annual period and still meet the lake nutrient WQS. The loading capacity was calculated to meet the WQS during the growing season (June 1 through September 30). This time period contains the months that the general public typically uses the lake for aquatic recreation. This time of the year also corresponds to the growing season when water quality is likely to be impaired by excessive nutrient loading.

The West Twin River Reservoir TMDL had internal loading of TP incorporated in the model. Modeling results indicated that the lake watershed is mainly forest and wetlands, and therefore little reduction in runoff can occur (Section 4.3.1 of the TMDL). To meet the lake criteria, a 39% reduction in internal load is needed, as well as reduction in the WLA. (Section 4.3.1 of the TMDL). For Dinham Lake, the BATHTUB default internal loading function was sufficient to account for TP loading. Tables 22 and 23 of this Decision Document shows the TMDL summary for the lakes. For West Twin River Reservoir, the overall TP reduction is estimated to be 32%, with a 43% reduction in TP from the Mountain Iron WWTP, and a 39% reduction in load allocation (mainly internal loading). For Dinham Lake, the overall TP reduction is 19%, from the load allocation.

<u>Critical conditions:</u> The critical condition for the bacteria, TSS, TP, and temperature TMDLs is the late summer season, when flows are low and temperatures are higher. During this time, the pollutants remain in the system longer, allowing bacteria to remain, DO levels to decrease, temperatures to increase, and the greatest stress on biological communities. MPCA accounted for the critical conditions by modeling impacts during these critical times, ensuring that if pollutant loadings will meet the water quality standards under these conditions, then they will be met in less critical times.

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

4. Load Allocations (LA)

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.

<u>Comment:</u>
Load allocations are addressed in Section 4 of the TMDL. The *E. coli* LAs for the eleven *E. coli* TMDLs are in Tables 8-18 of this Decision Document. Review of the LDCs show that the exceedences occur under all flow conditions, indicating there are both wet and dry-weather sources contributing to the impairments. The LAs for TSS are in Tables 19-20 of this Decision

[6] BATHTUB Manual - http://www.wwwalker.net/bathtub/help/bathtubWebMain.html

Document. Review of the LDCs show that the exceedences occur under all flow conditions but particularly under higher flows, indicating that precipitation-related sources are of particular concern. The LAs for the West Twin River Reservoir and Dinham Lake TP TMDLs are in Tables 22-23 of this Decision Document. The LA for the Wyman Creek temperature TMDL is in Table 21 of this Decision Document. None of the LAs were subdivided by source type, but were calculated as "gross allotments" as per 40 CFR 130.2(g).

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

5. Wasteload Allocations (WLAs)

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

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

Comment:

***E. coli*:**

MPCA identified two active WWTPs discharging to *E. coli*-impaired streams (Section 4.1 of the TMDL). These facilities were given an individual WLA based upon the maximum daily flow times the *E. coli* geometric mean criteria of 126 org/100 mL (Table 24 of this Decision Document).

Table 24: *E. coli* TMDL WLAs

Segment Name and ID	Facility	Permit ID	Design Wet Flow (mgd)	Effluent Conc. Limit (org/100 mL)	*E. coli* WLA (billion org/day)
Barber Creek/East Swan River: 569 and 641	Central Iron Range Sanitary Sewer District (CIRSSD)	MN0020117	2.5	126 geometric mean	11.9
Unnamed Creek/ East Swan Creek: 888	Hibbing South WWTP	MN0030643	4.5	126 geometric mean	21.5

In Section 4.1.1 and Table 83 of the TMDL, MPCA stated that CIRSSD discharges to a portion of Barber Creek that is classified as Class 7, a limited use water. As such, it has higher *E. coli* criteria of 630/100 ml geometric mean based on minimum of 5 samples taken within any calendar month and 1260/100 mL not to be exceeded by more than 10% of the samples taken within any calendar month. However, the remaining portion of Barber Creek is Class 2A, and thus must meet the Class 2A bacteria criteria. MPCA set the WLA to meet the downstream portion of Barber Creek.

MPCA noted that the Class 7 bacteria criteria applies from May 1 to October 31, while the Class 2A criteria applies from April 1 to October 31. To comply with the CIRSSD's WLA, the MPCA noted that it has future permit discretion to: 1) expand the fecal coliform[7] effluent limit effective period to include April, or 2) require the permittee to conduct a stream monitoring program to determine whether Barber Creek is impaired for *E. coli* in April and implement an expanded disinfection period only if the impairment occurs in April. MPCA determined that further reductions in *E. coli* load, beyond the extension of the disinfection months, are not needed. The EPA notes this plan is not part of this TMDL decision, and will be addressed in the NPDES permit process.

MPCA determined individual WLAs for the MS4 permittees in the *E. coli*-impaired watersheds (Tables 8-18 and Table 25 of this Decision Document). The MS4 WLAs were based upon the land area under the jurisdiction of the MS4 permit as discussed in Section 4.3.1 of the TMDL. MPCA also determined MS4 WLAs for three townships as noted in Table 25 of this Decision Document. MPCA anticipates the townships will be designated as MS4s in the near future, and therefore determined WLAs.

Table 25: *E. coli* WLAs for MS4 sites in the St. Louis River Watershed

MS4 Name	Permit Number	Reach (ID)*	MS4 Regulated Area (acres)
Hibbing City	MS400270	542, 569, 580, 582, 641, 888, 936, A22	5424
Hermantown City	MS400093	543, 625	117
Midway Township	MS400146	625	9
Cloquet City	MS400267	543	895
St. Louis County	MS400158	543	38
MnDOT Outstate District	MS400180	543	44
Grand Lake Township	proposed	543	262
Canosia township	proposed	543	143
Thompson Township	proposed	543, 751	126

* - Tables 8-18 contain the specific WLAs for each permittee

TSS:

MPCA determined that two point sources discharge to TSS-impaired waterbodies (Section 4.2 of the TMDL). Both dischargers are WWTPs. Table 26 of this Decision Document lists the

[7] While the MPCA bacteria criteria are for *E. coli*, the effluent limits by rule in MPCA NPDES permits are for fecal coliform.

facilities for which TSS WLAs were calculated by MPCA. All the facilities in Table 26 of this Decision Document have a WLA based upon the design flow and the TSS WQS of 10 mg/L (Section 4.2.1 of the TMDL). MPCA noted that the technology-based TSS limits in the NPDES permits are 30 mg/L as a calendar month average and 45 mg/L as a maximum calendar week average. MPCA explained that the facilities have tertiary treatment systems which result in very low actual effluent TSS concentrations (Section 4.2.1 of the TMDL).

Table 26: TSS TMDL WLAs

Segment Name and ID	Facility	Permit ID	Design Flow (mgd)	TSS WLA (tons/day)*
East Swan River - 558	Central Iron Range Sanitary Sewer District (CIRSSD)	MN0020117	2.5	0.10
East Swan River - 558	Hibbing WWTP South	MN0030643	4.5	0.19
East Swan River - 558	Hibbing City MS4	MS400270	4643 (acres)	**

* - Applies from April 1 to September 30

** - See Table 19 for the flow regime WLA

MPCA also determined a MS4 WLA for the City of Hibbing (East Swan River – 558). The MS4 WLA was based upon the land area under the jurisdiction of the MS4 permit (4643 acres) multiplied by a target runoff rate of 0.05 tons per acre as discussed in Section 4.2.1 of the TMDL. MPCA explained that this target rate is within the expected range of loading rates for Minnesota cities using primarily wet ponds to treat runoff. The WLAs were calculated for the very high, high, and mid-range flow regimes, as runoff is not expected to occur under lower flows. The WLA is in Table 19 of this Decision Document.

MPCA set aside 0.02% total loading capacity to account for TSS loading from construction and industrial stormwater (Tables 19-20 of this Decision Document; Section 4.2.1 of the TMDL). MPCA reviewed the areal coverage of construction and industrial general permits issued in the counties, and calculated coverage to be 0.02% each. MPCA noted that the WLA for East Swan Creek includes discharge from the Hibbing Taconite Company. MPCA explained that the discharge is from a series of stormwater pits, which have lengthy retention time and therefore very low TSS loads. The state determined that the facility has minimal impact on TSS loads in the East Swan River and therefore no WLA is needed (Section 4.2.1 of the TMDL, Response to Comments from MPCA to Hibbing Taconite Company).

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; they 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.

TP:

MPCA determined that two point sources discharge to the West Two Rivers Reservoir (Section 4.3.1 of the TMDL). One discharger is a WWTP and one is an industrial wastewater discharger (Table 27 of this Decision Document). The Mountain Iron WWTP has a current TP permit limit of 2.08 kg/day and a 1.0 mg/L monthly TP average. The WLA is based upon the current design flow and an effluent concentration of 0.23 mg/L of TP (Section 4.3.1 of the TMDL).

The US Steel- Minntac Mining area also discharges industrial wastewater to the West Two Rivers Reservoir. MPCA noted that the actual discharge over a 10-year period is much lower (6.2 MGD) than the permitted average daily volume (12.8 MGD) and the permitted daily maximum volume (49.2 MGD). Sampling of the industrial discharge shows that the average TP concentration is 0.005 mg/l, well below the lake criteria of 0.030 mg/L. To ensure a realistic calculation of the TP loading impacts on the lake, MPCA modeled the Minntac discharge at the current flows and concentrations.

Table 27: Individual TP WLAs for West Two River Reservoir

Wastewater Treatment Facility (NPDES Permit #)	Average Wet Weather Design Flow (MGD)	Observed Daily Average flow (MGD)	TP WLA (lb/year)	TP WLA (lb/day)
Mountain Iron WWTP (MN0040835)	0.55	--	385	1.1
US Steel–Minntac Mining Area (MN0052493)		6.2	94*	0.26*

* - MPCA noted that the WLA may be exceeded if the increase is due to higher discharge volumes at or below the 0.005 mg/L phosphorus concentration. See Section 10 for further discussion.

No point source dischargers were identified in the Dinham Lake watershed other than potential construction or industrial stormwater discharges (Table 23 of this Decision Document and Section 4.3.1 of the TMDL).

MPCA set aside a portion of the total WLA to account for TP loading from construction stormwater and from industrial stormwater of 0.02% each. MPCA reviewed the areal coverage of construction permits issued in the counties, and calculated coverage based upon the areal extent. For industrial stormwater, MPCA reviewed the state-wide industrial stormwater permit data, and calculated the extent of each watershed based upon permit coverage. Each watershed has a WLA calculated for construction and industrial stormwater.

MPCA explained that BMPs and other stormwater control measures should be implemented at active construction sites to limit the discharge of pollutants of concern; they 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.

Temperature/DO:
MPCA determined that one point source discharges to Wyman Creek (Section 4.5.1 of the TMDL). The Cliffs Erie-Hoyt Lakes Mining Area (MN004236) discharges water from an abandoned mining area into Wyman Creek. Monitoring results by MPCA determined that the discharge is slightly elevated in temperature compared to Wyman Creek, but has a much higher DO level. The QUAL2K modeling effort demonstrated that Wyman Creek is positively impacted by the higher-DO water, more than offsetting the slightly higher temperature (Appendix D of the TMDL). MPCA noted that the DO level is the critical target for attaining the biological use, and therefore the discharge from the abandoned mine has a beneficial impact on DO levels in Wyman Creek (Section 4.5.1 and Appendix D of the TMDL). Therefore, MPCA determined that Cliffs Erie-Hoyt Lake does not have reasonable potential to cause or contribute to impairment in Wyman Creek. Based upon this determination, MPCA did not determine a WLA for Cliffs Erie-Hoyt Lakes Mining Area (WLA = 0).

MPCA set aside a portion of the total WLA to account for temperature loading from construction stormwater and from industrial stormwater of 0.1% each. MPCA reviewed the areal coverage of construction permits issued in the counties, and calculated coverage based upon the areal extent. For industrial stormwater, MPCA reviewed the state-wide industrial stormwater permit data, and calculated the extent of each watershed based upon permit coverage. Each watershed has a WLA calculated for construction and industrial stormwater.

MPCA explained that BMPs and other stormwater control measures should be implemented at active construction sites to limit the discharge of pollutants of concern; they 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 storm water 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.

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

6. Margin of Safety (MOS)

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

Comment:

E. coli:

The *E. coli* TMDLs incorporated an explicit MOS of 10% of the total loading capacity (Section 4.1.1 of the TMDL). The MOS reserved 10% of the loading capacity and allocated the remaining loads to point (WLA) and nonpoint sources (LA) (Tables 8-18 of this Decision Document). MPCA used both flow gages in the impaired waters as well as results from the HSPF model flow modeling to generate the LDC curves (Section 4.1.1 of the TMDL; St. Louis, Cloquet, and Nemadji River Basin Models Calibration, Volume 1-3 Tetratech, 2016). The HSPF modeling utilized nine stream flow gages in the watershed.

The use of the LDC approach minimized variability associated with the development of the 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. The calibration results indicate the model adequately characterized the waterbody segments, and therefore additional MOS is not needed.

The MOS 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.

TSS:

The TSS TMDLs incorporated an explicit MOS of 10% of the total loading capacity (Tables 19-20 of this Decision Document). MPCA determined this is sufficient based upon the modeling results. MPCA used both flow gages in the impaired waters as well as results from the HSPF model flow modeling to generate the LDC curves. MPCA noted that the MOS is reasonable due to the generally good calibration of the HSPF model for hydrology and pollutant loading (Section 4.2.1 of the TMDL; St. Louis, Cloquet, and Nemadji River Basin Models Calibration, Volume 1-3 Tetratech, 2016). The HSPF modeling utilized nine stream flow gages in the watershed. The calibration results indicate the model adequately characterize the waterbody segments, and therefore additional MOS is not needed.

TP:

The two lake TP TMDLs incorporated an explicit MOS of 10% of the TMDL (Table 22-23 of this Decision Document). MPCA used results from the HSPF model flow modeling to provide flow and loading inputs into the BATHTUB model (Section 4.3.1 and Appendix C-1 of the TMDL).

MPCA noted that the MOS is reasonable due to the generally good calibration of the HSPF BATHTUB model for hydrology and pollutant loading (Section 4.2.1 of the TMDL; St. Louis, Cloquet, and Nemadji River Basin Models Calibration, Volume 1-3 Tetratech, 2016). The HSPF modeling utilized nine stream flow gages in the watershed. The calibration results indicate the models adequately characterize the waterbody segments, and therefore additional MOS is not needed.

Temperature/DO:

The temperature TMDL for Wyman Creek incorporated an implicit MOS in the TMDL (Table 21 of this Decision Document). The QUAL2K model determined the temperature and DO relationship for several scenarios, before determining the scenario that would attain the DO WQS (Section 4.5.1 and Appendix D of the TMDL). The TMDL scenario slightly overachieves the DO criteria and temperature target that is needed to attain the biological use.

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)).

Comment:

Bacteria: Bacterial loads vary by season, typically reaching higher values in the dry summer months when low flows and warm water contribute to bacteria abundance, and reaching relatively lower values in colder months when bacterial growth rates attenuate. Bacterial WQS need to be met between April 1st to October 31st, regardless of the flow condition. The development of the LDC utilized flow measurements from local flow gages. These flow measurements were collected over a variety of flow conditions observed during the recreation season. The LDC developed from these flow records represents a range of flow conditions within the *E. coli* – impaired watersheds and thereby accounted for seasonal variability over the recreation season.

TSS: The TSS WQS applies from April to September which is also the time period when high concentrations of sediment are expected in the surface waters of the St. Louis River watershed. Sediment loading to surface waters in the watershed varies depending on surface water flow, land cover and climate/season. Typically in the watershed, sediment is being moved from terrestrial source locations into surface waters during or shortly after wet weather events. Spring is typically associated with large flows from snowmelt, the summer is associated with the growing season as well as periodic storm events and receding streamflows, and the fall brings increasing precipitation and rapidly changing agricultural landscapes. Large precipitation events and minimally covered land surfaces can lead to large runoff volumes, especially to those areas which drain agricultural fields. The conditions generally occur in the spring and early summer seasons. The LDC developed from these flow records represents a range of flow conditions within the TSS – impaired watersheds and thereby accounted for seasonal variability over the recreation season.

TP: The nutrient targets employed in the two lakes nutrient TMDLs were based on the average nutrient values collected during the growing season (June 1 to September 30). The water quality criteria were designed to be met during the period of the year where the frequency and severity of algal growth and low DO is the greatest, the mid-late summer. The mid-late summer time period is typically when eutrophication standards are exceeded and water quality in the lakes is deficient. By calibrating the TMDL development efforts to protect water bodies during the worst water quality conditions of the year, MPCA assumes that the loading capacity established by the TMDL will be protective of water quality during the remainder of the calendar year (October through May).

Temperature/DO: The temperature and DO targets for the TMDL were extensively modeled to determine the impacts of daily and seasonal temperature changes on DO levels. MPCA accounted for seasonal variations in both temperature and DO through the modeling effort (Appendix D of the TMDL).

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

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

Comment:
Sections 6 and 8 of the TMDL provide information on actions and activities to reduce pollutant loading in the watershed. The main entities responsible for overseeing the pollutant reduction activities will be the MPCA, St. Louis, Carlton, Itasca, and Aitkin Counties and several Soil and Water Conservation Districts (SWCD).

MPCA identified several SWCDs that will provide actions and activities to attain WQSs in the St. Louis River watershed. The South St. Louis SWCD has implemented several watershed restoration project to restore trout streams in the St. Louis River watershed and nearby watersheds. A streambank connectivity analysis of impaired waters in the SWCD looked at addressing TSS impairments in a nearby watershed, and this effort could serve as a model for further practices in the St. Louis River watershed. The North St. Louis River SWCD has also implemented projects to restore trout streams in the watershed. These projects will also serve as models for future efforts.

Reasonable assurance that the WLA set forth in the TMDLs 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. MPCA's NPDES permit program is the implementing program for ensuring effluent limits are consistent with the TMDL.

All regulated MS4 communities are required to satisfy the requirements of the MS4 general permit. The MS4 general permit requires the permittee to develop an SWPPP which addresses all permit requirements, including the following six minimum control measures:

- Public education and outreach;

- Public participation;
- Illicit Discharge Detection and Elimination (IDDE) Program;
- Construction-site runoff controls;
- Post-construction runoff controls; and
- Pollution prevention and municipal good housekeeping measures.

A SWPPP is a management plan that describes the MS4 permittee's activities for managing stormwater within their jurisdiction or regulated area. In the event a TMDL study has been completed, approved by EPA prior to the effective date of the general permit, and assigned a wasteload allocation to an MS4 permittee, that permittee must document the WLA in its application and provide an outline of the best management practices to be implemented in the current permit term to address any needed reduction in loading from a MS4 community.

The stormwater program requires construction and industrial sites to create a SWPPP that summarizes how stormwater will be minimized from a site. Permittees are required to review the adequacy of local SWPPPs to ensure that each plan meets WLA set in the TMDL. In the event that the SWPPP does not meet the WLA, the SWPPP will need to be modified prior to the effective date of the next General Permit. This applies to the MS4, Construction, and Industrial Stormwater General Permits.

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 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). The WRAPS report for the St. Louis River watershed was finalized on August 9, 2018. Several of the implementation actions listed in the WRAPS report are already underway.

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).

The EPA finds that this criterion has been adequately addressed.

9. Monitoring Plan to Track TMDL Effectiveness

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

Comment:
The final TMDL document outlines the water monitoring efforts in the St. Louis River watershed (Section 7 of the TMDL). Water quality monitoring is a critical component of the adaptive management strategy employed as part of the implementation planning efforts for these watersheds.

Follow-up monitoring is integral to the adaptive management approach. Monitoring addresses uncertainty in the efficacy of implementation actions and can provide assurance that implementation measures are succeeding in attaining water quality standards, as well as inform the ongoing TMDL implementation strategy. To assess progress toward meeting the TMDL targets, monitoring of the waterbodies will continue to be a part of the Soil and Water Conservation Districts monitoring programs. MPCA noted that monitoring will be especially important in the St. Louis River watershed, as the land use differs in the watershed. The northern portion of the TMDL watershed (Swan River-related) have little agriculture, so other sources such as failing septics and aging infrastructure are more significant sources, while the southern portion of the TMDL watershed has greater agriculture and thus a different mixture of sources. At a minimum, the St. Louis River Watershed will be monitored once every 10 years as part of the MPCA's Intensive Watershed Monitoring cycle, with the next scheduled monitoring in 2019.

The EPA finds that this criterion has been adequately addressed.

10. Implementation

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

Comment:
Implementation strategies are outlined in Section 8 of the TMDL and in the St. Louis River WRAPS plan. The MPCA presented a variety of possible implementation activities which could be undertaken within the watersheds. Most of these actions will address all four pollutants.

Urban/residential stormwater reduction strategies: One of the watersheds has significant amounts of urban/suburban land (Bear Creek). MPCA anticipates that controls on stormwater will be needed to attain and maintain WQS. As noted in Section 5 of this Decision Document, the SWPPPs will be reviewed and revised as needed.

Pasture and Manure Management BMPs: Controlling animal sources, especially manure from small farms in the watersheds, was identified as a significant implementation activity by MPCA. Livestock exclusion from streams, alternate watering facilities, adoption of rotational grazing, and manure management are expected to reduce pollutant loads entering the waterbodies.

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 runoff before the runoff enters the creeks.

Septic System Control: Counties within the St. Louis River watershed have developed ordinances to protect human health and the environment. Upgrades of noncomplying systems may be required to obtain building permits and upon property sale. County support via the St. Louis River WRAPS process may result in designating grants or loans to help in upgrading old and failing septic systems. Failing and noncompliant SSTSs adjacent to lakes, streams and associated drainages should receive the highest priority.

Public Education Efforts: Public programs will be developed to provide guidance to the general public on pollutant reduction efforts and their impact on water quality. These educational efforts could also be used to inform the general public on what they can do to protect the overall health of the waterbodies.

Internal TP reduction (West Two River Reservoir): The TP TMDL for West Two River Reservoir requires a reduction in internal TP load. In Section 8.3 of the TMDL, MPCA discusses the options available to reduce internal TP loading.

The EPA finds that this criterion has been adequately addressed. The EPA reviews 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.

Comment:

The public participation section of the TMDL submittal is found in Section 9 of the TMDL. Throughout the development of the St. Louis River watershed TMDLs the public was given various opportunities to participate in the TMDL process. The MPCA encouraged public participation through public meetings and small group discussions with stakeholders within the watershed.

A kick-off meeting was held on June 4, 2014, to begin the WRAPS process. Tables 88 and 89 of the TMDL lists the numerous meetings regarding the WRAPS and TMDL process held in the watershed. Participants included local government officials, stakeholders, and the public.

The draft TMDL was posted online by the MPCA at (http://www.pca.state.mn.us/water/tmdl). The 30-day public comment period began on February 20, 2018 and ended on March 22, 2018. The MPCA received two public comments and adequately addressed these comments. Comments were submitted by the Hibbing Taconite Company (HTC), and the Minnesota Center for Environmental Advocacy (MCEA).

The comments from HTC noted that stormwater discharges from the HTC mining pits flow through a series of mining pits/ponds, where TSS settle out before discharge, or are contained in the pits and do not discharge. HTC requested, and MPCA agreed, to revise the discussion of stormwater discharge from the HTC pits to explain why the facility does not contribute TSS to East Swan Creek, and remove the WLA assigned to HTC. The TMDL was revised as appropriate.

The comments from MCEA focused on the WRAPS document, and not on the TMDL. MCEA raised concerns regarding additional pollutants including sulfate and conductivity, additional lakes impaired due to eutrophication which are not addressed by the St, Louis River watershed TMDLs, and the lack of nonpoint source controls and monitoring for the WRAPS document. MPCA responded that the State is in the process of developing sulfate and conductivity standards, but does not have numeric criteria to address aquatic life use (Class 2A and 2B) at this time. Regarding the lake eutrophication criteria, MPCA noted that the shallow lakes in question (impaired lakes not addressed in the TMDL) are listed as impaired, but the TMDLs have been deferred until the State has determined if a revised criterion for shallow lakes in the Northern Lakes and Forest Ecoregion is needed. MCEA also questions the detail regarding the non-point source reductions and if sufficient monitoring was proposed to ensure the scale of the impairments is fully understood. MCPA explained that the TMDLs provide additional detail on the source reductions for the various subwatersheds, and that the St. Louis River watershed is scheduled for follow-up basin monitoring in 2019.

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

Comment:

The EPA received the final St. Louis River watershed TMDL document, submittal letter and accompanying documentation from the MPCA on September 17, 2018. The transmittal letter explicitly stated that the final St. Louis River watershed TMDL for *E. coli*, total phosphorus, temperature, and TSS were being submitted to EPA pursuant to Section 303(d) of the Clean Water Act for 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 St. Louis River watershed by the MPCA satisfies the requirements of this twelfth element.

13. Conclusion

After a full and complete review, the EPA finds that the TMDLs for the St. Louis River watershed satisfy all of the elements of approvable TMDLs. This approval is for 16 TMDLs, addressing aquatic recreational use impairments due to bacteria and phosphorus and aquatic life use due to TSS and temperature .

The EPA's approval of these TMDLs extends to the water bodies which are identified In Table 1 of this Decision Document 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.

EPA sent a letter to the Fond du Lac Band of Chippewa in Minnesota. In the letter, EPA offered the Tribal representatives the opportunity to consult with the EPA regarding these TMDLs. EPA received no response.

Table 8: *E. coli* TMDL summary, Buhl Creek (04010201-580)

TMDL Parameter (Permit #)	Flow Regime				
	Very High	High	Mid-Range	Low	Very Low
	E. coli Load (billion org/day)				
Wasteload Allocation: Hibbing City MS4 (MS400270)	0.201	0.0481	0.0156	0.00494	0.000631
Load Allocation	41.9	10.0	3.26	1.03	0.132
MOS	4.68	1.12	0.364	0.115	0.0147
Loading Capacity [a]	46.8	11.2	3.64	1.15	0.147
Existing Load	51.7	5.71	11.1	–	–
Percent Load Reduction	9%	0%	67%	–	–
Percent Load Reduction for Regulated MS4 [b]	0%	0%	0%	0%	0%
Percent Load Reduction for Unregulated Sources	19%	0%	71%	–	–

a. Loading capacities are rounded to three significant digits.

b. Runoff from the regulated MS4 does not contribute to the impairment, and MS4 load reductions are not required.

Table 9: *E. coli* TMDL summary, Dempsey Creek (04010201-582)

TMDL Parameter (Permit #)	Flow Regime				
	Very High	High	Mid-Range	Low	Very Low
	E. coli Load (billion org/day)				
Wasteload Allocation: Hibbing City MS4 (MS400270)	4.11	0.984	0.301	0.0892	0.0221
Load Allocation	196	46.9	14.3	4.22	1.08
MOS	22.2	5.32	1.62	0.479	0.122
Loading Capacity [a]	222	53.2	16.2	4.79	1.22
Existing Load	398	29.0	10.7	2.98	–
Percent Load Reduction	44%	0%	0%	0%	–
Percent Load Reduction for Regulated MS4 [b]	0%	0%	0%	0%	0%
Percent Load Reduction for Unregulated Sources	50%	0%	0%	0%	–

a. Loading capacities are rounded to three significant digits.

b. Runoff from the regulated MS4 does not contribute to the impairment, and MS4 load reductions are not required.

Table 10: *E. coli* TMDL summary, Barber Creek (04010201-641)

TMDL Parameter (Permit #)		Flow Regime				
		Very High	High	Mid-Range	Low	Very Low
		E. coli Load (billion org/day)				
Wasteload Allocation:	Hibbing City MS4 (MS400270)	4.11	0.984	0.301	0.0892	0.0221
	Central Iron Range Sanitary Sewer District (MN0020117) [a]	11.9	11.9	11.9	11.9	11.9
Load Allocation		252	61.2	21.4	7.16	1.82
MOS		30.1	8.31	3.77	2.14	1.53
Loading Capacity [b]		301	83.1	37.7	21.4	15.3
Existing Load		646	64.6	32.5	15.0	--
Percent Load Reduction		53%	0%	0%	0%	–
Watershed Percent Load reductions[c]		59%	0%	0%	0%	–

a. To implement CIRSSD's WLA, the MPCA has future permit discretion to: 1) expand the fecal coliform effluent limit effective period to include April, or 2) require the permittee to conduct a stream monitoring program to determine whether Barber Creek is impaired for *E. coli* in April and implement an expanded disinfection period only if the impairment occurs in April. Further reductions in *E. coli* load, beyond the extension of the disinfection months, are not needed.
b. Loading capacities are rounded to three significant digits.
c. The watershed percent reductions apply to the regulated MS4s and the unregulated watershed runoff in the LA.

Table 11: *E. coli* TMDL summary, Penobscot Creek (04010201-936)

TMDL Parameter (Permit #)	Flow Regime				
	Very High	High	Mid-Range	Low	Very Low
	E. coli Load (billion org/day)				
Wasteload Allocation: Hibbing City MS4 (MS400270)	12.6	3.12	1.00	0.306	0.0443
Load Allocation	24.9	6.15	1.98	0.603	0.0871
MOS	4.17	1.03	0.331	0.101	0.0146
Loading Capacity [a]	41.7	10.3	3.31	1.01	0.146
Existing Load	177	37.1	32.8	12.1	–
Percent Load Reduction	76%	72%	90%	92%	–
Watershed Percent Load Reduction [b]	79%	75%	91%	93%	–

a. Loading capacities are rounded to three significant digits.
b. The watershed percent reductions apply to the regulated MS4s and the unregulated watershed runoff in the LA.

Table 12: *E. coli* TMDL summary, Barber Creek (04010201-569)

TMDL Parameter (Permit #)		Flow Regime				
		Very High	High	Mid-Range	Low	Very Low
		E. coli Load (billion org/day)				
Wasteload Allocation	Hibbing City MS4 (MS400270)	21.3	5.23	1.74	0.555	0.110
	Central Iron Range Sanitary Sewer District (MN0020117) [a]	11.9	11.9	11.9	11.9	11.9
Load Allocation		309	75.6	26.7	9.14	2.66
MOS		38.0	10.3	4.48	2.40	1.63
Loading Capacity [b]		380	103	44.8	24.0	16.3
Existing Load		1,810	189	94.9	57.4	–
Percent Load Reduction		79%	46%	53%	58%	–
Watershed Percent Load Reduction [c]		82%	54%	66%	79%	–

a. To implement CIRSSD's WLA, the MPCA has future permit discretion to: 1) expand the fecal coliform effluent limit effective period to include April, or 2) require the permittee to conduct a stream monitoring program to determine whether Barber Creek is impaired for *E. coli* in April and implement an expanded disinfection period only if the impairment occurs in April.

Further reductions in *E. coli* load, beyond the extension of the disinfection months, are not needed.

b. Loading capacities are rounded to three significant digits.

c. The watershed percent reductions apply to the regulated MS4s and the unregulated watershed runoff in the LA.

Table 13: *E. coli* TMDL summary, Unnamed Creek (04010201-A22)

TMDL Parameter (Permit #)	Flow Regime				
	Very High	High	Mid-Range	Low	Very Low
	E. coli Load (billion org/day)				
Wasteload Allocation: Hibbing City MS4 (MS400270)	2.51	0.599	0.179	0.049	0.00762
Load Allocation	28.3	6.75	2.02	0.548	0.0860
MOS	3.42	0.817	0.244	0.0663	0.0104
Loading Capacity [a]	34.2	8.17	2.44	0.663	0.104
Existing Load	39.6	11.0	0.511	0.0681	–
Percent Load Reduction	14%	26%	0%	0%	–
Percent Load Reduction for Regulated MS4 [b]	0%	0%	0%	0%	0%
Percent Load Reduction for Unregulated Sources	22%	33%	0%	0%	–

a. Loading capacities are rounded to three significant digits.

b. Runoff from the regulated MS4 does not contribute to the impairment, and MS4 load reductions are not required.

Table 14: *E. coli* TMDL summary, unnamed creek (04010201-542)

TMDL Parameter (Permit #)	Flow Regime				
	Very High	High	Mid-Range	Low	Very Low
	E. coli Load (billion org/day)				
Wasteload Allocation: Hibbing City MS4 (MS400270)	9.19	2.48	1.05	0.606	0.414
Load Allocation	56.7	16.0	7.36	4.72	3.44
MOS	7.32	2.05	0.934	0.592	0.428
Loading Capacity [a]	73.2	20.5	9.34	5.92	4.28
Existing Load	133	12.5	8.98	5.88	–
Percent Load Reduction	45%	0%	0%	0%	–
Watershed Percent Load Reduction [b]	51%	0%	0%	0%	–

a. Loading capacities are rounded to three significant digits.

b. The watershed percent reductions apply to the regulated MS4s and the unregulated watershed runoff in the LA.

Table 15: *E. coli* TMDL summary, Unnamed Creek (04010201-888)

TMDL Parameter (Permit #)		Flow Regime				
		Very High	High	Mid-Range	Low	Very Low
		E. coli Load (billion org/day)				
Wasteload Allocation	Hibbing City MS4 (MS400270)	27.4	7.37	3.12	1.82	1.21
	Hibbing WWTP South (MN0030643) [a]	21.5	21.5	21.5	21.5	21.5
Load Allocation		111	29.8	12.6	7.37	4.83
MOS		17.8	6.52	4.14	3.41	3.06
Loading Capacity [b]		178	65.2	41.4	34.1	30.6
Existing Load		522	94.5	30.7	71.7	–
Percent Load Reduction		66%	31%	0%	52%	–
Watershed Percent Load Reduction [c]		72%	49%	0%	82%	–

a. Reductions in *E. coli* load from Hibbing WWTP South are not needed to meet the WLA.

b. Loading capacities are rounded to three significant digits.

c. The watershed percent reductions apply to the regulated MS4s and the unregulated watershed runoff in the LA.

Table 16: *E. coli* TMDL summary, Pine River (04010201-543)

TMDL Parameter (Permit #)		Flow Regime				
		Very High	High	Mid-Range	Low	Very Low
		E. coli Load (billion org/day)				
Wasteload Allocation	Hermantown City MS4 (MS400093)	0.273	0.0833	0.0330	0.0107	0.00295
	Cloquet City MS4 (MS400267)	0.119	0.0362	0.0143	0.00464	0.00128
	Canosia Township MS4 [a]	1.46	0.445	0.176	0.0570	0.0158
	Grand Lake Township MS4 [a]	2.68	0.816	0.323	0.105	0.0289
	MnDOT Outstate District MS4 (MS400180)	0.448	0.136	0.0540	0.0175	0.00483
	St. Louis County MS4 (MS400158)	0.383	0.117	0.0463	0.0150	0.00414
Load Allocation		299	91.1	36.1	11.7	3.23
MOS		33.8	10.3	4.08	1.32	0.365
Loading Capacity [b]		338	103	40.8	13.2	3.65
Existing Load		64.1	88.7	32.1	10.5	–
Percent Load Reduction [c]		0%	0%	0%	0%	–
Percent Load Reduction for Regulated MS4s [d]		0%	0%	0%	0%	0%
Percent Load Reduction for Unregulated Sources [c]		32%				

a. Not currently regulated but expected to come under permit coverage in the next permit cycle.

b. Loading capacities are rounded to three significant digits.

c. When comparing the geometric mean *E. coli* concentration of each flow regime to the geometric mean standard, the Pine River does not require a load reduction (Figure 67). However, the monthly geometric mean standard was violated based on July data. Using the July *E. coli* geometric mean of 184 organisms per 100 mL, a 32% reduction is needed for the Pine River to meet water quality standards in July, and should come primarily from reduction in *E. coli* loading from livestock; the primary known source of *E. coli* to the Pine River is livestock (Table 47).

d. Regulated MS4s do not contribute to the impairment and are not required to reduce *E. coli* loading.

Table 17: *E. coli* TMDL summary, Unnamed Creek / West Rocky Run (04010201-625)

TMDL Parameter (Permit #)		Flow Regime				
		Very High	High	Mid-Range	Low	Very Low
		E. coli Load (billion org/day)				
Wasteload Allocation	Hermantown City MS4 (MS400093)	0.885	0.271	0.109	0.0368	0.0110
	Midway City MS4 (MS400146)	0.0834	0.0255	0.0103	0.00347	0.00103
Load Allocation		55.7	17.1	6.86	2.32	0.692
MOS		6.30	1.93	0.775	0.262	0.0782
Loading Capacity [a]		63.0	19.3	7.75	2.62	0.782
Existing Load		3,840	33.3	13.0	1.91	–
Percent Load Reduction		98%	42%	40%	0%	–
Percent Load Reduction for Regulated MS4 [b]		0%	0%	0%	0%	0%
Percent Load Reduction for Unregulated Sources		99%	48%	46%	0%	–

a. Loading capacities are rounded to three significant digits.

b. Runoff from the regulated MS4s does not contribute to the impairment, and MS4 load reductions are not required.

Table 18: *E. coli* TMDL summary, Hay Creek (04010201-751)

TMDL Parameter	Flow Regime				
	Very High	High	Mid-Range	Low	Very Low
	E. coli Load (billion org/day)				
Wasteload Allocation: Thomson Township MS4 [a]	1.23	0.376	0.151	0.0511	0.0152
Load Allocation	75.1	23.0	9.21	3.13	0.930
MOS	8.48	2.60	1.04	0.353	0.105
Loading Capacity [b]	84.8	26.0	10.4	3.53	1.05
Existing Load	7,770	21.5	12.2	0.925	–
Percent Load Reduction	99%	0%	15%	0%	–
Percent Load Reduction for Regulated MS4 [c]	0%	0%	0%	0%	0%
Percent Load Reduction for Unregulated Sources	99%	0%	23%	0%	–

a. Not currently regulated but expected to come under permit coverage in the next permit cycle.
b. Loading capacities are rounded to three significant digits.
c. Runoff from the regulated MS4 does not contribute to the impairment, and MS4 load reductions are not required.

Table 19: TSS TMDL summary, East Swan River (04010201-558)

TMDL Parameter (NPDES permit number, where applicable)			Flow Regime				
			Very High	High	Mid-Range	Low	Very Low
			TSS Load (ton/day)				
Wasteload Allocation	Construction Stormwater (MNR100001) [a]		0.0018	0.00044	0.00014	0.000047	0.000019
Wasteload Allocation	Industrial Stormwater	Industrial Stormwater General Permits (MNR050000)[a]	0.0018	0.00044	0.00014	0.000047	0.000019
Wasteload Allocation	Hibbing City MS4 (MS400270)		6.0	1.6	0.64	–	–
Wasteload Allocation	Hibbing South WWTP [b] (MN0030643)		0.19	0.19	0.19	0.19	0.19
Wasteload Allocation	Central Iron Range Sanitary Sewer District [b] (MN0020117)		0.10	0.10	0.10	0.10	0.10
Load Allocation [c]			3.6	0.81	0.15	0.26	0.11
MOS			1.1	0.30	0.12	0.061	0.044
Loading Capacity [d]			11	3.0	1.2	0.61	0.44
Existing Load			361	16	3.2	0.34	–
Percent Load Reduction			97%	81%	63%	0%	–

a. It is assumed that loads from permitted construction and industrial stormwater sites that operate in compliance with the permits are meeting the WLA.

b. WLAs for the two WWTPs apply from April 1 through September 30 and are based on the AWWDF and 10 mg/L TSS.

c. Applies to channel erosion and unregulated watershed runoff.

d. Loading capacities are rounded to two significant digits, except in the case of values greater than 100, which are rounded to the nearest whole number.

Table 20: TSS TMDL summary, Stony Creek (04010201-963)

TMDL Parameter		Flow Regime				
		Very High	High	Mid-Range	Low	Very Low
		TSS Load (tons/d)				
Wasteload Allocation	Construction Stormwater General Permit (MNR100001) [a]	0.00034	0.00010	0.000046	0.000020	0.0000072
	Industrial Stormwater General Permit (MNR050000) [a]	0.00034	0.00010	0.000046	0.000020	0.0000072
Load Allocation		1.8	0.56	0.25	0.10	0.038
MOS		0.20	0.062	0.027	0.012	0.0043
Loading Capacity [b]		2.0	0.62	0.28	0.11	0.042
Existing Load		6.4	0.88	0.26	–	–
Percent Load Reduction		69%	30%	0%	–	–

a. It is assumed that loads from permitted construction and industrial stormwater sites that operate in compliance with the permits are meeting the WLA.

b. Loading capacities are rounded to two significant digits.

Table 21: Total phosphorus TMDL summary, West Two Rivers Reservoir (69-0994-00)

TMDL Parameter			TP TMDL Load (lbs/yr)	TP TMDL Load (lbs/day)
WLA	Mountain Iron WWTP (MN0040835) [a]		385	1.1
	US Steel–Minntac Mining Area (MN0052493) wastewater [b]		94	0.26
	Construction stormwater (MNR100001) [c]		0.26	0.00071
	Industrial Stormwater	US Steel–Minntac Mining Area (MN0052493) stormwater [c]	0.26	0.00071
		Industrial Stormwater General Permits (MNR050000 and MNG490000) [c]		
Load Allocation [d]			1,607	4.4
MOS			232	0.64
Loading Capacity [e]			**2,319**	**6.4**
Existing Load			3,389	9.3
Load Reduction			1,070	2.9
Percent Load Reduction			32%	

a. The WLA for Mountain Iron WWTP is based on the TP concentration of 0.23 mg/L and the facility's AWWDF (Table 75 of the TMDL). The WLA was determined based on the TMDL model scenario in which the nonpoint sources are reduced to natural background conditions and US Steel–Minntac discharges at their existing observed volume and load.

b. The WLA for US Steel–Minntac Mining Area is equal to their existing load, calculated as the product of the average effluent discharge volume and the observed phosphorus concentration in the effluent (Table 76 of the TMDL).

c. It is assumed that loads from permitted construction and industrial stormwater sites that operate in compliance with the permits are meeting the WLA.

d. The load allocation is based on the natural background conditions model scenario, which determined a need for a reduction of 39% (1,015 lb/yr) from nonpoint sources. The reductions will need to come primarily from internal loading. See Table 54 in the TMDL for existing loads.

e. Loading capacities are rounded to whole numbers (annual load) or one decimal place (daily load).

Table 22: Total phosphorus TMDL summary, Dinham Lake (69-0544-00)

TMDL Parameter	TP Load (lbs/yr)	TP Load (lbs/day)
WLA: Construction stormwater (MNR100001) [a]	0.14	0.00038
WLA: Industrial Stormwater (MNR050000) [a]	0.14	0.00038
Load Allocation	816	2.2
MOS	91	0.25
Loading Capacity [b]	**907**	**2.5**
Existing Load	1,123	3.1
Load Reduction	216	0.6
Percent Load Reduction	19%	

a. It is assumed that loads from permitted construction and industrial stormwater sites that operate in compliance with the permits are meeting the WLA.

b. Loading capacities are rounded to whole numbers (annual load) or one decimal place (daily load).

Table 23: Wyman Creek temperature TMDL

Temperature TMDL	Load (million Kcal/day)	Implementation Targets
Wasteload Allocation: Industrial Stormwater General Permit (MNR050000) [a]	0.1	– [a]
Wasteload Allocation: Construction Stormwater General Permit (MNR100001) [a]	0.1	– [a]
Wasteload Allocation: Cliffs Erie–Hoyt Lakes Mining Area (MN0042536)	– [b]	No reductions needed
Load Allocation	151.9	• Removal of the west braid and rerouting of all flow to Reaches 7, 8, and 10 • Average daylight hours shade of 57% along Reaches 7, 8, and 10 • Average daylight hours shade of 57% along Reach 6 or equivalent implementation to reduce instream temperatures entering Reach 7 to 19.7 °C
MOS	*Implicit*	
Loading Capacity	152.1	
Existing Load	169.2	
Percent Load Reduction	10%	

a. It is assumed that loads from permitted industrial and construction stormwater sites that operate in compliance with the permit are meeting the WLA.

b. The WLA for Cliffs Erie–Hoyt Lakes Mining Area (MN0042536) is set to existing conditions. Scenario 4 (Appendix D od the TMDL) evaluated the effect of Cliffs Erie–Hoyt Lakes Mining Area discharges, and determined that the point source does not have reasonable potential to cause or contribute to impairment on the reaches of interest (reaches 7–10 in Appendix D of the TMDL); therefore the facility can continue to discharge at existing conditions. Reductions from point sources are not needed to meet the TMDL in the lower reaches 7–10.