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

FEB 2 2 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 twenty five waterbodies in the Zumbro River watershed, including supporting documentation and follow up information. The Zumbro River watershed is located in Olmsted, Dodge, Wabasha, Goodhue, Steele and Rice Counties, Minnesota. The TMDLs were calculated for *E. coli*, total phosphorus, and total suspended solids. The TMDLs address the impairments of aquatic recreational 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 twenty five TMDLs in the Zumbro 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

for Christopher Korleski
Director, Water Division

Enclosure

cc: Celine Lyman, MPCA
Justin Watkins, MPCA

wq-iw7-45g

TMDL: Zumbro River #2 Watershed TMDL, Olmsted, Dodge, Wabasha, Goodhue, Steele and Rice Counties, MN
Date: 2/22/2018

DECISION DOCUMENT FOR THE ZUMBRO RIVER #2 WATERSHED TMDLS; OLMSTED, DODGE, WABASHA, GOODHUE, STEELE, AND RICE 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 Zumbro River watershed is located in Olmsted, Dodge, Wabasha, Goodhue, Steele and Rice Counties, Minnesota, in the southeast portion of Minnesota. The Zumbro River begins in Rice and Steele Counties, and flows east to the Mississippi River just south of Lake Pepin. The TMDL addresses seventeen streams impaired for bacteria, seven streams impaired for total suspended solids (TSS) and one lake impaired for total phosphorus (TP). A TMDL report for the Zumbro River was approved in 2012, which addressed turbidity in a portion of the Zumbro River basin. This TMDL Decision Document addresses additional impaired waters in the basin, and will be referred to as the "Zumbro River #2".

Table 1 of this Decision Document identifies the waterbodies addressed in this TMDL. The physical characteristics of the lake 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 Zumbro River #2 Watershed TMDLs

HUC-10 Watershed	Listed Waterbody Name	Reach (AUID)	Designated Use Class	Bacteria	Phosphorus	TSS
Middle Fork Zumbro River	Milliken Creek	07040004-555	2B, 3C			x
Middle Fork Zumbro River	Zumbro River	07040004-973	2B, 3C	x		
Middle Fork Zumbro River	Zumbro River	07040004-992	2B, 3C	x		
Middle Fork Zumbro River	Zumbro River	07040004-993	2B, 3C			x
North Fork Zumbro River	Trout Brook	07040004-515	1B, 2A, 3B	x		
North Fork Zumbro River	Zumbro River	07040004-971	2B, 3C	x		x
South Branch Middle Fork Zumbro River	Rice Lake	74-0001-00	2B, 3C		x	
South Branch Middle Fork Zumbro River	Zumbro River	07040004-978	2B, 3C	x		
South Branch Middle Fork Zumbro River	Dodge Center Creek	07040004-989	2B, 3C	x		x
South Fork Zumbro River	Bear Creek	07040004-538	2B, 3C	x		
South Fork Zumbro River	Unnamed Creek	07040004-595	2B, 3C	x		
South Fork Zumbro River	Unnamed Creek	07040004-596	2B, 3C	x		
Zumbro River	West Indian Creek	07040004-542	1B, 2A, 3B	x		
Zumbro River	Long Creek	07040004-565	1B, 2A, 3B	x		
Zumbro River	Middle Creek	07040004-567	1B, 2A, 3B	x		
Zumbro River	Spring Creek	07040004-568	1B, 2A, 3B			x
Zumbro River	Spring Creek	07040004-570	1B, 2A, 3B	x		x
Zumbro River	Trout Brook	07040004-571	1B, 2A, 3B	x		
Zumbro River	Hammond Creek	07040004-575	1B, 2A, 3B	x		
Zumbro River	Dry Run Creek	07040004-576	2B, 3C	x		
Zumbro River	Spring Creek Tributary	07040004-769	1B, 2A, 3B	x		x

Table 2: Rice Lake Physical Characteristics

HUC-10 Watershed	South Branch Middle Fork Zumbro River
Watershed Area (ac)	4352
Surface Area (ac)	609
Mean Depth (m)	0.9
Max Depth (m)	2.1

Table 3: Impaired River/Creek information

HUC-10 Watershed	Listed Waterbody Name	Reach (AUID)	AUID Length (miles)	Watershed Area (ac)
Middle Fork Zumbro River	Milliken Creek	07040004-555	4.72	19,975
Middle Fork Zumbro River	Zumbro River	07040004-973	34.25	82,102
Middle Fork Zumbro River	Zumbro River	07040004-992	9.01	132,563
Middle Fork Zumbro River	Zumbro River	07040004-993	6.37	275,942
North Fork Zumbro River	Trout Brook	07040004-515	10.73	35,625
North Fork Zumbro River	Zumbro River	07040007-971	45.22	116,786
South Branch Middle Fork Zumbro River	Zumbro River	07040004-978	8.56	140,453
South Branch Middle Fork Zumbro River	Judicial Ditch 1	07040004-987	4.68	19,191
South Branch Middle Fork Zumbro River	Dodge Center Creek	07040004-989	24.47	57,374
South Fork Zumbro River	Bear Creek	07040004-538	2.95	51,812
South Fork Zumbro River	Unnamed Creek	07040004-595	0.84	8,552
South Fork Zumbro River	Unnamed Creek	07040004-596	0.91	3,268
Zumbro River	West Indian Creek	07040004-542	6.52	16,856
Zumbro River	Long Creek	07040004-565	8.94	21,026
Zumbro River	Middle Creek	07040004-567	4.88	11,404
Zumbro River	Spring Creek	07040004-568	4.19	21,069
Zumbro River	Spring Creek	07040004-570	1.96	40,862
Zumbro River	Trout Brook	07040004-571	2.1	6,042
Zumbro River	Hammond Creek	07040004-575	1.57	7,210
Zumbro River	Dry Run Creek	07040004-576	4.25	19,236
Zumbro River	Spring Creek Tributary	07040004-769	0.6	966

Land Use:
The Zumbro River watershed is a mixture of grassland/pasture (23.2%), and agricultural land (56%), with some urban land (9.0%) in the South Fork Zumbro River watershed (Section 3.5 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:
Almost all the waterbodies were placed on the MPCA 303(d) list of impaired waters in 2016. The segments were placed on the MPCA 303(d) list of impaired waters due to exceedances of the *E. coli*, TP and TSS criteria. Section 3.6 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 and TP criteria.

Water quality in Rice Lake significantly exceeded the TP criterion. The average TP concentration in the lake was 290 ug/L. The lake also had average concentrations of 148 ug/L for chlorophyll-a (chl-a), and 0.229 m for Secchi depth. The criteria for Rice Lake are TP ≤ 90 ug/L, chl-a ≤ 30 ug/L, and Secchi depth ≥ 0.7 m.

In 2012, the Zumbro River turbidity TMDL was approved. This TMDL project addressed 17 waterbodies impaired by TSS, mainly in the South Branch Zumbro River watershed. There is one waterbody that overlaps with the previous TMDL, Dodge Center Creek. After the 2012 TMDL was approved, MPCA redesignated the lower portion of Dodge Center Creek, and revised the segment ID. Segment 592 in the original 2012 TMDL is now Segment 989. The new TMDL for Segment 989 replaces the previously approved TMDL.

Pollutants of Concern:
The pollutants of concern are *E. coli*, TP, 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. Flow alterations in the Zumbro River watershed have resulted from drainage improvements on or near agricultural lands. Specifically, tile drains and land smoothing have increased surface and subsurface flow to streams. This results in higher peak flows during storm events and flashier flows which carry sediment loads to streams and erode stream banks.

Source Identification (point and nonpoint sources):
Bacteria:
Point Source Identification:
MPCA identified thirteen Wastewater Treatment Facilities (WWTF) discharging to six bacteria-impaired watersheds (Table 34 of Section 5 of this Decision Document). MPCA also identified several Municipal Separate Storm Sewer Systems (MS4) in three watersheds. Table 4 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 Oronoco Township is expected to meet the requirements for a MS4 permit in the near future, and therefore calculated an allocation for the township.

Table 4: MS4 Permittees in the Zumbro River watershed

Water Body Name	Reach (ID)	Watershed Area (acres)	MS4 area (acres)	% MS4 area	List of MS4 Communities		Parameter
Zumbro River	07040004-978	140,453	739	0.53%	Oronoco Township (FUTURE)		*E. coli*
Zumbro River	07040004-993	275,942	5,685	2.06%	Oronoco Township (FUTURE)		TSS
Bear Creek	07040004-538	51,812	10,882	21.0%	Federal Medical Center	17 acres	*E. coli*
					Haverhill Township	2 acres	
					Marion Township	2017 acres	
					MnDOT Outstate	855 acres	
					Olmstead County	214 acres	
					Rochester City	6753 acres	
					Rochester Comm & Tech College	101 acres	
					Rochester Township	923 acres	
Dry Run Creek	07040004-576	19,236	1,566	8.14%	Oronoco Township (FUTURE)		*E. coli*

Permitted Construction and Industrial Areas: Construction and industrial sites may contribute bacteria via runoff during stormwater events. These areas within the watersheds must comply with the requirements of the MPCA's NPDES Stormwater Program. The NPDES program requires construction and industrial sites to create Stormwater Pollution Prevention Plans (SWPPPs) which summarize how stormwater pollutant discharges will be minimized from construction and industrial sites.

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

Concentrated Animal Feeding Operations (CAFOs): MPCA identified 38 active CAFOs in the Zumbro River watershed (Section 3.7.3.1 of the TMDL; Table 36 of Section 5 of this Decision Document). CAFOs are regulated under the EPA National Pollutant Discharge Elimination System (NPDES) program and are generally defined as large confined animal operations. CAFO facilities must be designed to contain all surface water runoff (i.e., have zero discharge from their facilities) and have a current manure management plan. MPCA explained that these facilities do not discharge effluent and therefore were not assigned a portion of the WLA (WLA = 0).

Nonpoint Source Identification: The potential nonpoint sources for the Zumbro River watershed bacteria 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 agricultural land use practices and 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 Zumbro 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. Feedlots generate manure which may be spread onto fields. Runoff from fields with spread manure can be exacerbated by tile drainage lines, which channelize the stormwater flows and reduce the time available for bacteria to die-off. MPCA identified approximately 1,030 AFOs in the Zumbro River watershed (Section 3.7.3.1 and Figure 14 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, who provided data on septic systems in the watersheds. MPCA determined that there are septic systems in use in the watersheds, and that failing septic systems are a source of bacteria in the watersheds (Table 21 of the TMDL).

TSS:

Point Source Identification:
MPCA identified thirteen Wastewater Treatment Facilities (WWTF) discharging to one TSS-impaired watershed (Table 37 of Section 5 of this Decision Document). MPCA also identified one MS4 in the Zumbro River watershed (-993). Table 4 of this Decision Document identifies the MS4 permittees in the watersheds. Stormwater from MS4s can transport sediment to surface water bodies during or shortly after storm events. MPCA explained that Oronoco Township is expected to meet the requirements for a MS4 permit in the near future, and therefore calculated an allocation for the township.

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

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.

Upland erosion: During the modeling process, MPCA determined that erosion from upland sources contributes 42% of the sediment load in the Zumbro River watershed (Section 3.7.4.2 of the TMDL). Gully/ravine erosion contributed 18%, and bed/bank erosion contributed 39%. Table 22 of the TMDL provides the sediment sources by watershed.

Stormwater runoff from agricultural land use practices: Runoff from agricultural lands may contain significant amounts of sediment which may lead to impairments in the Zumbro River watershed. Sediment inputs to surface waters can be exacerbated by tile drainage lines, which channelize the stormwater flows. Tile lined fields and channelized ditches enable particles to move more efficiently into surface waters.

Phosphorus:

Point Source Identification: MPCA determined that there are no point sources discharges (WWTFs, MS4, CSOs) to Rice Lake (Section 3.7.2.1 of the TMDL). Two CAFOs are located within the Rice Lake watershed.

Non-Point Source Identification: The potential nonpoint sources for the Rice Lake watershed phosphorus TMDL are:

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

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, who provided data on septic systems in the watershed.

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 3.7.3.2 of the TMDL).

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 Zumbro River 2 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 Zumbro 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 1 of this Decision Document, the impaired waters addressed by this TMDL are designated as either Classes 1B/2A/3B or Classes 2B/3C. Class 1B waters are protected for drinking water use, and are described as

> *"The quality of Class 1B waters of the state shall be such that with approved disinfection, such as simple chlorination or its equivalent, the treated water will meet both the primary (maximum contaminant levels) and secondary drinking water standards…"*

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. "*

Class 3 waters are protected for industrial use. While the uses vary for waters in the watershed, the bacteria criteria are the same for the various uses. The TSS criteria does depend upon the designated use as noted below.

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 Zumbro 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 Rice Lake are those set forth for Class 2B shallow lakes in the Western Corn Belt Plains (WCBP) 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 Rice Lake in the WCBP Ecoregion

Parameter	Eutrophication Standard Shallow Lakes
Total Phosphorus (µg/L)	TP ≤ 90
Chlorophyll-a (µg/L)	chl-a ≤ 30
Secchi Depth (m)	SD ≥ 0.7

Target:
MPCA selected a target of 81 µg/L of TP for Rice Lake to develop the lake nutrient TMDL. As further explained in Section 6 of this Decision Document, MPCA reduced the criteria by 10% to account for Margin of Safety. 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 Zumbro River watershed

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

* Applicable from April 1-September 30.

Targets: MPCA employed the South Region TSS criteria of 10 mg/L and 65 mg/L.

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.

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 two approaches for TMDLs in the Zumbro River watershed, both 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); and (2) a conventional daily load mass balance for the Rice Lake (TP) TMDL. The lake TMDL 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 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.[1,2] The output of the HSPF process is a model of multiple HRUs, or subwatersheds of the overall Zumbro River watershed. The flow from these HRUs were calibrated to eight different gage sites with up to twelve years of data (1996 through 2009).

***E. coli*:**

The approach utilized by the MPCA to calculate the loading capacity for the *E. coli* TMDLs are described in Section 4.3 of the final 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 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.

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

[2] EPA TMDL Models Webpage - https://www.epa.gov/exposure-assessment-models/tmdl-models-and-tools

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 Zumbro 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 (Figures 18-34 of the TMDL). The FDC was developed from flow data from several monitoring sites in the Zumbro 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 4.3.1 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 18-34 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 seventeen waterbodies were calculated as appropriate. The regulated permittees discharging *E. coli* have allocations determined for them (Tables 8-24 found in Attachment 1 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%-90% are needed to attain standards.

Tables 8-24 in Attachment 1 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 U.S. EPA technical memos.[3]

TSS:

The approach utilized by the MPCA to calculate the loading capacity for the TSS TMDLs is described in Section 4.4 of the final TMDL.

For the TSS TMDLs, the TSS criteria of 10 mg/L for Class 2A waters and 65 mg/L for Class 2B waters (Table 1 and Table 7 of this Decision Document) were used to calculate the loading capacity of the TMDLs.

[3] U.S. Environmental Protection Agency. August 2007. *An Approach for Using Load Duration Curves in the Development of TMDLs*. Office of Water. EPA-841-B-07-006. Washington, D.C.

The same process was used for the TSS TMDLs as was used for the bacteria TMDLs. A FDC was created for the waterbodies (Figures 35-43 of the TMDL). The FDC was developed from flow data from several monitoring sites in the Zumbro 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 4.3.1 of the TMDL).

The FDC was transformed into a LDC by multiplying individual flow values by the WQS (10 mg/L or 65 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. For two segments (-989 Dodge Center Creek and -570 Spring Creek), water quality data was limited, so MPCA used the HSPF flow simulations to model TSS loads in the two segments. For these two segments, two LDCs were developed; one using water quality data and one using modeled values. In either case, the loading capacity remained the same. The modeled LDCs better identified under what flow conditions exceedences were occurring (Section 4.4.6 of the TMDL).

TMDLs for the seven waterbodies were calculated as appropriate. The regulated permittees discharging TSS have allocations determined for them (Tables 25-31 of Attachment 2 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 while exceedences are occurring under all flow conditions, the greatest exceedences are occurring under higher flows, indicating precipitation-related sources are significant contributors to the TSS impairments.

Tables 25-31 of Attachment 2 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.

Total Phosphorus:
MPCA used the U.S. Army Corps of Engineers (USACE) BATHTUB model to calculate the loading capacity for Rice Lake (Section 4.2 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".[4] This TMDL uses 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.

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

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 would meet the applicable WQS.[5] 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 Rice Lake. 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 Rice Lake TMDL had internal loading of TP incorporated in the model. Modeling results indicated that the lake did not respond completely to watershed run-off reductions. To account for internal loading, an internal load of 4.95 $mg/m^3/day$ was added to the model (Section 4.2.1 of the TMDL). Table 32 of this Decision Document shows the TMDL summary for the lake.

Table 32: Rice Lake TMDL Summary

Rice Lake 74-0001-00 Load Allocation		Existing TP Load		Allowable TP Load		Estimated Load Reduction	
		kg/yr	kg/day	kg/yr	kg/day	kg/yr	%
Margin of Safety 10%*							
Wasteload	Permitted Municipal and Industrial Wastewater Facilities**	NA	NA	NA	NA	NA	NA
	Permitted Industrial Stormwater Facilities***	NA	NA	NA	NA	NA	NA
	Construction and Industrial Stormwater	0.57	0.002	0.57	0.002	NA	NA
	MS4****	NA	NA	NA	NA	NA	NA
	Total WLA	0.57	0.002	0.57	0.002	NA	NA
Total Load Allocation (LA)		5062.0	13.86	565.29	1.55	4496.72	88.83
Total Load Capacity (WLA + LA)		**5062.57**	**13.86**	**565.85**	**1.55**	**4496.72**	**88.82**

* 10% MOS was taken off the WQ target concentration

** No permitted wastewater facilities within the lake drainage area

*** No permitted individual stormwater facilities in the watershed

**** No current MS4 communities within the drainage area

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

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.

Comment:

Load allocations are addressed in Section 4 of the final TMDL document. The *E. coli* LAs for the seventeen *E. coli* TMDLs are in Tables 8-24 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 25-31 of this Decision 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 LA for the Rice TP TMDL is in Table 32 of this Decision Document. MPCA noted that there are no point sources identified in the watershed, so the actual loading to the lake is all LA. 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 fourteen WWTFs discharging to *E. coli*-impaired streams (Appendix B 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 33 of this Decision Document).

Table 33: *E. coli* TMDL WLAs

Segment Name and ID	Facility	Permit ID	Design Flow (mgd)	Effluent Conc. Limit (org/100 mL)	*E. coli* WLA (billion org/day)
Zumbro River - 973	West Concord WWTF	MN0025241	0.473	126	2.26
Zumbro River - 992	Pine Island WWTF	MN0024511	0.705	126	3.36
Trout Brook - 515	Goodhue WWTF	MN0020958	0.099	126	0.47
Zumbro River - 971	Kenyon WWTF	MN0021628	0.357	126	1.70
Zumbro River - 971	Mazeppa WWTF	MN0046752	0.073	126	0.35
Zumbro River - 971	Wanamingo WWTF	MN0022209	0.458	126	2.18
Zumbro River - 971	Zumbrota WWTF	MN0025330	1.110	126	5.29
Zumbro River - 978	Byron WWTF	MN0049239	1.400	126	6.68
Zumbro River - 978	Kasson WWTF	MN0050725	2.070	126	9.87
Zumbro River - 978	Mantorville WWTF	MN0021059	0.232	126	1.11
Dodge Center Creek - 989	Claremont WWTF	MN0022187	0.206	126	0.98
Dodge Center Creek - 989	Dodge Center WWTF	MN0021016	0.973	126	4.64
Dodge Center Creek - 989	Hayfield WWTF	MN0023612	0.780	126	3.72

MPCA determined individual WLAs for the MS4 permittees in the Bear Creek (-538) *E. coli*-impaired watershed (Table 34 of the TMDL and Table 14 of this Decision Document). The MS4 WLAs were based upon the land area under the jurisdiction of the MS4 permit as discussed in Section 4.3.3 of the TMDL. MPCA also determined a MS4 WLA for Oronoco Township (Zumbro River - 978 and Dry Run Creek – 576). MPCA anticipates the township will be designated as a MS4 in the near future, and therefore determined a WLA.

MPCA identified numerous CAFOs in the watershed. MPCA noted that these feedlots must be designed to totally contain runoff, and manure management planning requirements are more stringent than for smaller feedlots. CAFOs are inspected by the MPCA in accordance with the MPCA NPDES Compliance Monitoring Strategy approved by the EPA. All CAFOs are inspected by the MPCA on a routine basis with an appropriate mix of field inspections, offsite monitoring and compliance assistance. Smaller AFOs are inspected either by MPCA or by county inspector in designated counties. The number of AUs by animal type registered with the MPCA feedlot database are summarized in Table 35 for the permitted CAFOs in the Zumbro River watershed. The CAFOs were not given an allocation (WLA = 0).

Table 34: CAFOs in the Zumbro River watershed

Facility Name	NPDES Permit No	Livestock Type	AUs
BC Calf Farm	MNG441289	Cows	980
Belvidere Group Partner - Merle	MNG440031	Swine	1260
Brian Edgar Farm - Sec 18	MNG440449	Swine	1200
Brian Herbst Farm Sec 2	MNG441115	Swine	1022
Central Livestock Assn - Zumbrota Market	MNG441119	Cows, Horse, Sheep, & Swine	1530
Craig & Carly Benedix Farm - Craig 3000	MNG440445	Swine	900
Craig & Caryl Benedix Farm - Ridge	MNG440445	Swine	900
Daley Brothers LLC	MN0067911	Cows	1428
David C Johnson Farm Sec - 20	MNG440260	Swine	1124.4
David Gosch Farm	MNG441180	Cows & Swine	972
Donley Farm Inc	MNG441101	Cows & Swine	1382.4
Durst Bros Dairy - Site I	MNG440646	Cows	2240
Ellingsberg Farm	MNG441030	Swine	864
Eric Dressel	MNG441214	Swine	1470
Fieseler Farms	MNG440787	Swine	1200
Grandview Hogs of Dodge Center LLP - Sow	MNG440054	Swine	912.6
Grant T Erler Farm	MNG441240	Swine	895
Jason Tebay Farm	MNG441032	Swine	1320
Jennie-O Turkey Store - Claremont Farm	MNG440039	Poultry	1839
Kevin Hoebing Farm	MNG441192	Swine	1459.5
Knott Farms	MNG440030	Swine	1200
Luke Scherger	MNG441008	Swine	2250
Manco of FMT Inc	MNG440042	Swine	1500
Mathew & Daniel Arendt Farm	MNG440942	Swine	1020
McNallan Dairy	MNG440504	Cows	1196
Minnesota Family Farms - Sow Site 1	MNG440044	Swine	1096
Nicholas Hanson Farm	MNG440765	Swine	1500
Richard Wolf Farm	MNG440963	Cows, Goats, & Swine	946.5
Schoenfelder Farms LLP -Main Farm	MN0063517	Cows, Horse, & Swine	4317
Schumacher Farms of Elgin Inc	MN0070025	Cows	2417
Shane Wagner Farm South	MNG440575	Swine	900
Shane Wagner Farm West	MNG440575	Swine	1320
Toquam Hogs	MNG440043	Swine	1176
VanZuilen Enterprises	MNG440323	Swine	1200
VZ Hogs LLP - North Finishers	MNG440265	Swine	1200
VZ Hogs LLP - Sow Site 1	MNG440265	Swine	1032
Wayne Evers Farm	MNG441278	Cows	2523
William Schmidt Farm 1	MNG440451	Swine	900

There are no CSOs identified in the watersheds, therefore, they were not given an allocation (WLA = 0).

TSS:

MPCA determined that thirteen point sources discharge to TSS-impaired waterbodies (Appendix B of the TMDL). Twelve dischargers are WWTFs, and one is a crushed limestone facility (Stussy Construction). Table 35 of this Decision Document lists the facilities for which TSS WLAs were calculated by MPCA. None of these facilities discharge to Spring Brook or its tributaries, which have a TSS criteria of 10 mg/L. All the facilities in Table 36 of this Decision document have a WLA based upon the design flow and the TSS effluent limit of 30 mg/L (Section 4.3 of the TMDL).

Table 35: TSS TMDL WLAs

Segment Name and ID	Facility	Permit ID	Design Flow (mgd)	Effluent Conc. Limit (tons/day)	TSS WLA (tons/day)
Zumbro River - 971	Kenyon WWTF	MN0021628	0.357	30	0.04
Zumbro River - 971	Mazeppa WWTF	MN0046752	0.073	30	0.01
Zumbro River - 971	Wanamingo WWTF	MN0022209	0.458	30	0.06
Zumbro River - 971	Zumbrota WWTF	MN0025330	1.110	30	0.14
Zumbro River - 993	Byron WWTF	MN0049239	1.400	30	6.68
Zumbro River - 993	Kasson WWTF	MN0050725	2.070	30	9.87
Zumbro River - 993	Mantorville WWTF	MN0021059	0.232	30	1.11
Zumbro River - 993	Pine Island WWTF	MN0024511	0.705	30	0.09
Zumbro River - 993	Stussy Construction Inc.	MNG490134	0.540	30	0.07
Zumbro River - 993	West Concord WWTF	MN0025241	0.473	30	0.06
Dodge Center Creek - 989	Claremont WWTF	MN0022187	0.206	30	0.03
Dodge Center Creek - 989	Dodge Center WWTF	MN0021016	0.973	30	0.12
Dodge Center Creek - 989	Hayfield WWTF	MN0023612	0.780	30	0.10

MPCA also determined a MS4 WLA for Oronoco Township (Zumbro River - 993). MPCA anticipates the township will be designated as a MS4 in the near future, and therefore determined a WLA (Table 26 of this Decision Document and Table 47 of the TMDL). The MS4 WLA was based upon the land area under the jurisdiction of the MS4 permit as discussed in Section 4.3.3 of the TMDL.

MPCA set aside 0.10% total loading capacity to account for TSS loading from construction and industrial stormwater (Section 4.4.3 of the TMDL). MPCA reviewed the areal coverage of construction and industrial general permits issued in the counties, and calculated coverage to be 0.10%.

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 there are no WWTF, MS4s, or CSOs, in the Rice Lake watershed. Two CAFOs were identified in the watershed, but MPCA stated that that these feedlots must be designed to totally contain runoff, and manure management planning requirements are more stringent than for smaller feedlots. CAFOs are inspected by the MPCA in accordance with the MPCA NPDES Compliance Monitoring Strategy approved by the EPA. All CAFOs (NPDES permitted, State Disposal System (SDS) permitted and not required to be permitted) are inspected by the MPCA on a routine basis with an appropriate mix of field inspections, offsite monitoring and compliance assistance. The number of AUs by animal type registered with the MPCA feedlot database are summarized in Table 34 for the permitted CAFOs in the Zumbro River watershed. The CAFOs were not given an allocation (WLA = 0).

MPCA set aside a portion of the total WLA to account for TP loading from construction stormwater and from industrial stormwater of 0.10%. 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.

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 4.3.4 of the TMDL). The MOS reserved 10% of the loading capacity and allocated the remaining loads to point (WLA) and nonpoint sources (LA) (Tables 8-24 of this Decision Document). 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 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 25-31 of this Decision Document). MPCA determined this is sufficient based upon the modeling results. MPCA noted that the MOS is reasonable due to the generally good calibration of the HSPF model for hydrology and pollutant loading (Section 4.4.4 of the TMDL; Zumbro River Watershed, HSPF Model Development Project, Limnotech, 2014). The calibration results indicate the model adequately characterize the waterbody segments, and therefore additional MOS is not needed.

TP:
The Rice Lake TP TMDL incorporated an explicit MOS of 10% of the TMDL (Table 32 of this Decision Document). MPCA used an in-lake target of 81 µg/L rather than the WQS of 90 µg/L when calculating TP loads. MPCA noted that the MOS is reasonable due to the generally good calibration of the HSPF and BATHTUB models for hydrology and pollutant loading (Section 4.3.4 of the TMDL; Zumbro River Watershed, HSPF Model Development Project, Limnotech, 2014). The calibration results indicate the model adequately characterize the lake, and therefore additional MOS is not needed.

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 Zumbro 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 Rice Lake nutrient TMDL were based on the average nutrient values collected during the growing season (June 1 to September 30). The water quality criteria were designed to meet 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).

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:
Section 6 of the TMDL provides 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, Olmsted, Dodge, Wabasha, Goodhue, Steele and Rice Counties and several Soil and Water Conservation Districts (SWCD).

The Zumbro River Partnership has been active in the watershed. The Partnership has spent considerable time and money on implementation activities such as stream bank restoration and stormwater controls in the last decade. The Southeast Minnesota Water Resources Board has coordinated Section 319 funds to address small non-permitted feedlots in southeastern Minnesota. These feedlots were identified as a high priority by MPCA, and the improvements or elimination of these sources has helped reduce pollutant loads in the watershed.

The Southeast Minnesota Wastewater Initiative (SMWI) is a state-funded program designed to assist small communities to address wastewater problems. SMWI has assisted several communities in the Zumbro River watershed to upgrade wastewater systems, and reducing the loads of pollutants in the watershed.

Several SWCDs have mapped structural BMPs and drainage areas in the watershed (Figure 45 of the TMDL). This allows the SWCDs to track BMP progress and identify priority locations for further work. The SWCDs also are implementing the "Identifying Priority Erosion Sites " (IPES), to identify which portions of the Zumbro River watershed have the highest potential for erosion. The report from this project has been used to secure funding for implementation.

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 a Stormwater Pollution Prevention Plan (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 Zumbro River watershed was finalized on November 8, 2017. 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 Zumbro 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 the 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. For example, the Goodhue SWCD monitors waters in the Zumbro River watershed periodically. The SWCD Comprehensive Plan (2010-2020) describes the ongoing monitoring efforts in the county, including waters addressed under the TMDL. At a minimum, the Zumbro River Watershed will be monitored once every 10 years as part of the MPCA's Intensive Watershed Monitoring cycle.

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 final TMDL document and in the Zumbro 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 three 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 into the creeks.

Septic System Control: Counties within the Zumbro 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 Zumbro 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 (Rice Lake): The TP TMDL for Rice Lake requires a significant (over 90%) reduction in TP load. In Section 8.2 of the TMDL, MPCA discusses the options available to reduce internal TP loading. Recent efforts have focused on biomanipulation, where increases in aquatic plants and improving fish communities have been pursued to improve water quality. As the BMPs are implemented in the Rice Lake watershed, MPCA will review progress and determine if efforts should be continued or whether a more complete rough fish removal via chemical agents is warranted.

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 Zumbro 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 March 19, 2016, to begin the WRAPS process. Table 53 of the TMDL lists the seventeen 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 August 21, 2017 and ended on September 20, 2017. The MPCA received two public comments and adequately addressed these comments. Comments were submitted by the Minnesota Department of Transportation (MnDOT), and the Minnesota Department of Natural Resources (MDNR).

Only one of the comments from the MDNR focused on the TMDL; the other comments focused on the WRAPS document. MDNR suggested that the effects of climate change on the hydrology of the Zumbro River watershed should be included in the report. MPCA responded that a detailed analysis of climate change effects are beyond the scope of the TMDL, but noted that the reports used to develop the TMDL discuss the precipitation trends in southeast Minnesota.

The comment from the MnDOT expressed concerns about how the WLAs for bacteria and TSS could be implemented in the MnDOT permit. MnDOT noted that the loads are extremely small as a result of the very small land area that is the responsibility of MnDOT. MPCA noted that the TMDL discusses how the SWPPPs for the MnDOT land call for BMPs that are performance-based, and may be met through BMPs. Regarding construction runoff and TSS, MPCA cited the language from Section 8.1.1 of the TMDL (referenced in Section 5 of this Decision Document) which explains that if a construction stormwater permittee properly selects, installs and maintains appropriate BMPs, their discharge would be expected to be consistent with the WLA.

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 Zumbro River watershed TMDL document, submittal letter and accompanying documentation from the MPCA on November 21, 2017. The transmittal letter explicitly stated that the final Zumbro River watershed TMDL for *E. coli*, nutrients, 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 Zumbro 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 Zumbro River watershed satisfy all of the elements of approvable TMDLs. This approval is for 25 TMDLs, addressing aquatic recreational use impairments due to bacteria and phosphorus and aquatic life use due to TSS.

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.

Attachment 1 – *E. coli* TMDL Summaries for the Zumbro River #2 Watershed

Table 8: TMDL summary for the Zumbro River 07040004-973

Zumbro River 07040004-973 TMDL Summary		VHigh	High	Mid	Low	VLow
		Billions of Organisms/day				
E. coli Loading Capacity (TMDL)		1023.54	265.45	145.94	85.25	35.19
Wasteload Allocation (WLA) Components	Permitted Municipal and Industrial Wastewater Facilities*	2.26	2.26	2.26	2.26	2.26
	MS4**	NA	NA	NA	NA	NA
	Total WLA	2.26	2.26	2.26	2.26	2.26
Load Allocation		918.93	236.65	129.09	74.47	29.41
10% Margin of Safety		102.35	26.54	14.59	8.53	3.52

* See Table 34 of this Decision Document for list of permitted facilities

** No current MS4 communities within reach drainage area

Table 9: TMDL summary for the Zumbro River 07040004-992

Zumbro River 07040004-992 TMDL Summary		VHigh	High	Mid	Low	VLow
		Billions of Organisms/day				
E. coli Loading Capacity (TMDL)		1680.08	441.03	239.83	143.90	61.28
Wasteload Allocation (WLA) Components	Permitted Municipal and Industrial Wastewater Facilities*	5.62	5.62	5.62	5.62	5.62
	MS4**	NA	NA	NA	NA	NA
	Total WLA	5.62	5.62	5.62	5.62	5.62
Load Allocation		1506.45	391.30	210.23	123.89	49.54
10% Margin of Safety		168.01	44.10	23.98	14.39	6.13

* See Table 34 of this Decision Document for list of permitted facilities

** No current MS4 communities within reach drainage area

Table 10: TMDL summary for Trout Brook 07040004-515

Trout Brook 07040004-515 TMDL Summary		Flow Regime				
		VHigh	High	Mid	Low	VLow
		Billions of Organisms/day				
E. coli Loading Capacity (TMDL)		415.95	115.62	66.17	37.16	16.08
Wasteload Allocation (WLA) Components	Permitted Municipal and Industrial Wastewater Facilities*	0.47	0.47	0.47	0.47	0.47
	MS4**	NA	NA	NA	NA	NA
	Total WLA	0.47	0.47	0.47	0.47	0.47
Load Allocation		373.88	103.59	59.08	32.97	14.00
10% Margin of Safety		41.59	11.56	6.62	3.72	1.61

* See Table 34 of this Decision Document for list of permitted facilities
** No current MS4 communities within reach drainage area

Table 11: TMDL summary for the Zumbro River 07040004-971

Zumbro River 07040004-971 TMDL		Flow Regime				
		VHigh	High	Mid	Low	VLow
		Billions of Organisms/day				
E. coli Loading Capacity (TMDL)		1531.24	406.51	224.19	122.85	49.97
Wasteload Allocation (WLA) Components	Permitted Municipal and Industrial Wastewater Facilities*	9.53	9.53	9.53	9.53	9.53
	MS4**	NA	NA	NA	NA	NA
	Total WLA	9.53	9.53	9.53	9.53	9.53
Load Allocation		1368.59	356.33	192.25	101.04	35.45
10% Margin of Safety		153.12	40.65	22.42	12.29	5.00

* See Table 34 of this Decision Document for list of permitted facilities
** No current MS4 communities within reach drainage area

Table 12: TMDL Summary for the Zumbro River 07040004-978

Zumbro River 07040004-978 TMDL		Flow Regime				
		VHigh	High	Mid	Low	VLow
		Billions of Organisms/day				
E. coli Loading Capacity (TMDL)		1548.67	452.10	254.60	156.48	82.46
Wasteload Allocation (WLA) Components	Permitted Municipal and Industrial Wastewater Facilities*	27.00	27.00	27.00	27.00	27.00
	Oronoco Township MS4 (0.53% - FUTURE)	7.34	2.14	1.21	0.74	0.39
	Total WLA	34.34	29.14	28.21	27.74	27.39
Load Allocation		1359.47	377.74	200.93	113.09	46.82
10% Margin of Safety		154.87	45.21	25.46	15.65	8.25

*See Table 34 of this Decision Document for the list of permitted facilities

Table 13: TMDL summary for Dodge Center Creek 07040004-989

Dodge Center Creek 07040004-989 TMDL Summary		Flow Regime				
		VHigh	High	Mid	Low	VLow
		Billions of Organisms/day				
E. coli Loading Capacity (TMDL)		651.14	175.13	100.52	59.50	26.46
Wasteload Allocation (WLA) Components	Permitted Municipal and Industrial Wastewater Facilities*	9.34	9.34	9.34	9.34	9.34
	MS4**	NA	NA	NA	NA	NA
	Total WLA	9.34	9.34	9.34	9.34	9.34
Load Allocation		576.68	148.28	81.13	44.21	14.47
10% Margin of Safety		65.11	17.51	10.05	5.95	2.65

* See Table 34 of this Decision Document for list of permitted facilities
** No current MS4 communities within reach drainage area

Table 14: TMDL summary for Bear Creek 07040004-538

Bear Creek 07040004-538 TMDL Summary		Flow Regime				
		VHigh	High	Mid	Lo	VLow
		Billions of Organisms/day				
E. coli Loading Capacity (TMDL)		701.56	201.69	109.68	65.17	30.32
Wasteload Allocation (WLA) Components	Permitted Municipal and Industrial Wastewater Facilities*	NA	NA	NA	NA	NA
	Federal Medical Center MS4 (0.03%)	0.21	0.06	0.03	0.02	0.01
	Haverhill Township MS4 (0.004%)	0.02	0.01	0.004	0.002	0.001
	Marion Township MS4 (3.9%)	24.58	7.07	3.84	2.28	1.06
	MnDOT Outstate MS4 (1.7%)	10.42	3.00	1.63	0.97	0.45
	Olmsted County MS4 (0.4%)	2.61	0.75	0.41	0.24	0.11
	City of Rochester MS4 (13.0%)	82.30	23.66	12.87	7.65	3.56
	Rochester Community & Tech College MS4 (0.2%)	1.23	0.35	0.19	0.11	0.05
	Rochester Township MS4 (1.8%)	11.25	3.23	1.76	1.04	0.49
	Total WLA	132.61	38.12	20.73	12.32	5.73
Load Allocation		498.79	143.40	77.98	46.34	21.56
10% Margin of Safety		70.16	20.17	10.97	6.52	3.03

* No permitted wastewater facilities within reach drainage area

Table 15: TMDL summary for Unnamed Creek 07040004-595

Unnamed Creek 07040004-595 TMDL Summary		Flow Regime				
		VHigh	High	Mid	Low	VLow
		Billions of Organisms/day				
E. coli Equivalent Loading Capacity (TMDL)		94.37	23.42	12.43	6.79	2.35
Wasteload Allocation (WLA) Components	Permitted Municipal and Industrial Wastewater Facilities*	NA	NA	NA	NA	NA
	MS4**	NA	NA	NA	NA	NA
	Total WLA	NA	NA	NA	NA	NA
Load Allocation		84.93	21.08	11.19	6.11	2.11
10% Margin of Safety		9.44	2.34	1.24	0.68	0.23

* No permitted wastewater facilities within reach drainage area
** No current MS4 communities within reach drainage area

Table 16: TMDL summary for Unnamed Creek 07040004-596

Unnamed Creek 07040004-596 TMDL Summary		Flow Regime				
		VHigh	High	Mid	Low	VLow
		Billions of Organisms/day				
E. coli Equivalent Loading Capacity (TMDL)		36.16	8.68	4.63	2.51	0.84
Wasteload Allocation (WLA) Components	Permitted Municipal and Industrial Wastewater Facilities*	NA	NA	NA	NA	NA
	MS4**	NA	NA	NA	NA	NA
	Total WLA	NA	NA	NA	NA	NA
Load Allocation		32.54	7.81	4.16	2.26	0.75
10% Margin of Safety		3.62	0.87	0.46	0.25	0.08

* No permitted wastewater facilities within reach drainage area
** No current MS4 communities within reach drainage area

Table 17: TMDL summary for West Indian Creek 07070004-542

West Indian Creek 07040004-542 TMDL Summary		Flow Regime				
		VHigh	High	Mid	Low	VLow
		Billions of Organisms/day				
E. coli Loading Capacity (TMDL)		172.67	54.29	33.67	21.92	10.19
Wasteload Allocation (WLA) Components	Permitted Municipal and Industrial Wastewater Facilities*	NA	NA	NA	NA	NA
	MS4**	NA	NA	NA	NA	NA
	Total WLA	NA	NA	NA	NA	NA
Load Allocation		155.40	48.86	30.30	19.73	9.17
10% Margin of Safety		17.27	5.43	3.37	2.19	1.02

* No permitted wastewater facilities within reach drainage area
** No current MS4 communities within reach drainage area

Table 18: TMDL summary for Long Creek 07040004-565

Long Creek 07040004-565 TMDL Summary		Flow Regime				
		VHigh	High	Mid	Low	VLow
		Billions of Organisms/day				
E. coli Loading Capacity (TMDL)		209.08	60.31	36.49	22.73	10.93
Wasteload Allocation (WLA) Components	Permitted Municipal and Industrial Wastewater Facilities*	NA	NA	NA	NA	NA
	MS4**	NA	NA	NA	NA	NA
	Total WLA	NA	NA	NA	NA	NA
Load Allocation		188.17	54.28	32.84	20.46	9.84
10% Margin of Safety		20.91	6.03	3.65	2.27	1.09

* No permitted wastewater facilities within reach drainage area
** No current MS4 communities within reach drainage area

Table 19: TMDL summary for Middle Creek 07040004-567

Middle Creek 07040004-567 TMDL Summary		Flow Regime				
		VHigh	High	Mid	Low	VLow
		Billions of Organisms/day				
E. coli Loading Capacity (TMDL)		117.30	38.29	23.17	14.33	6.57
Wasteload Allocation (WLA) Components	Permitted Municipal and Industrial Wastewater Facilities*	NA	NA	NA	NA	NA
	MS4**	NA	NA	NA	NA	NA
	Total WLA	NA	NA	NA	NA	NA
Load Allocation		105.57	34.46	20.85	12.90	5.92
10% Margin of Safety		11.73	3.83	2.32	1.43	0.66

* No permitted wastewater facilities within reach drainage area
** No current MS4 communities within reach drainage area

Table 20: TMDL summary for Spring Creek 07040004-570

Spring Creek – 07040004-570 TMDL Summary		Flow Regime				
		VHigh	High	Mid	Low	VLow
		Billions of Organisms/day				
E. coli Loading Capacity (TMDL)		453.84	137.76	83.57	52.85	24.88
Wasteload Allocation (WLA) Components	Permitted Municipal and Industrial Wastewater Facilities*	NA	NA	NA	NA	NA
	MS4**	NA	NA	NA	NA	NA
	Total WLA	NA	NA	NA	NA	NA
Load Allocation		408.46	123.99	75.21	47.57	22.39
10% Margin of Safety		45.38	13.78	8.36	5.29	2.49

* No permitted wastewater facilities within reach drainage area
** No current MS4 communities within reach drainage area

Table 21: TMDL summary for Trout Brook 0704004-571

Trout Brook 07040004-571 TMDL Summary		Flow Regime				
		VHigh	High	Mid	Low	VLow
		Billions of Organisms/day				
E. coli Loading Capacity (TMDL)		57.64	19.54	12.50	8.24	4.44
Wasteload Allocation (WLA) Components	Permitted Municipal and Industrial Wastewater Facilities*	NA	NA	NA	NA	NA
	MS4**	NA	NA	NA	NA	NA
	Total WLA	NA	NA	NA	NA	NA
Load Allocation		51.88	17.59	11.25	7.41	4.00
10% Margin of Safety		5.76	1.95	1.25	0.82	0.44

* No permitted wastewater facilities within reach drainage area
** No current MS4 communities within reach drainage area

Table 22: TMDL summary for Hammond Creek 07040004-575

Hammond Creek 07040004-575 TMDL Summary		Flow Regime				
		VHigh	High	Mid	Low	VLow
		Billions of Organisms/day				
E. coli Loading	Capacity (TMDL)	89.48	28.13	16.73	10.85	6.52
Wasteload Allocation (WLA) Components	Permitted Municipal and Industrial Wastewater Facilities*	NA	NA	NA	NA	NA
	MS4**	NA	NA	NA	NA	NA
	Total WLA	NA	NA	NA	NA	NA
Load Allocation		80.53	25.32	15.06	9.77	5.87
10% Margin of Safety		8.95	2.81	1.67	1.09	0.65

* No permitted wastewater facilities within reach drainage area
** No current MS4 communities within reach drainage area

Table 23: TMDL summary for Dry Run Creek 07040004-576

Dry Run Creek 07040004-769 TMDL Summary		Flow Regime				
		VHigh	High	Mid	Low	VLow
		Billions of Organisms/day				
E. coli Loading Capacity (TMDL)		235.84	65.10	37.70	21.59	9.40
Wasteload Allocation (WLA) Components	Permitted Municipal and Industrial Wastewater Facilities*	NA	NA	NA	NA	NA
	Oronoco Township MS4 (8.14% - FUTURE)	17.28	4.77	2.76	1.58	0.69
	Total WLA	17.28	4.77	2.76	1.58	0.69
Load Allocation		194.98	53.82	31.17	17.85	7.77
10% Margin of Safety		23.58	6.51	3.77	2.16	0.94

* No permitted wastewater facilities within reach drainage area

Table 24: TMDL summary for Spring Creek Tributary 07040004-769

Spring Creek Tributary 07040004-576 TMDL Summary		Flow Regime				
		VHigh	High	Mid	Low	VLow
		Billions of Organisms/day				
E. coli Loading Capacity (TMDL)		10.73	3.26	1.98	1.25	0.59
Wasteload Allocation (WLA) Components	Permitted Municipal and Industrial Wastewater Facilities*	NA	NA	NA	NA	NA
	MS4**	NA	NA	NA	NA	NA
	Total WLA	NA	NA	NA	NA	NA
Load Allocation		9.66	2.93	1.78	1.12	0.53
10% Margin of Safety		1.07	0.33	0.20	0.12	0.06

* No permitted wastewater facilities within reach drainage area

** No current MS4 communities within reach drainage area

Table 25: TMDL summary for Milliken Creek 07040004-555

Milliken Creek 07040004-555 TMDL Summary		Flow Regime				
		VHigh	High	Mid	Low	VLow
		Tons/day				
TSS Loading Capacity (TMDL)		12.69	3.33	1.86	1.06	0.38
Wasteload Allocation (WLA) Components	Permitted Municipal and Industrial Wastewater Facilities*	NA	NA	NA	NA	NA
	Permitted Industrial Stormwater Facilities**	NA	NA	NA	NA	NA
	Construction and Industrial Stormwater	0.01	0.003	0.002	0.001	0.0003
	MS4***	NA	NA	NA	NA	NA
	Total WLA	0.01	0.003	0.002	0.001	0.0003
Load Allocation		11.41	3.00	1.67	0.95	0.34
10% Margin of Safety		1.27	0.33	0.19	0.11	0.04

* No permitted wastewater facilities within reach drainage area

** No permitted individual stormwater facilities within reach drainage area

*** No current MS4 communities within reach drainage area

Table 26: TMDL summary for the Zumbro River 07040004-993

Zumbro River 07040004-993 TMDL Summary		Flow Regime				
		VHigh	High	Mid	Low	VLow
		Tons/day				
TSS Loading Capacity (TMDL)		189.00	52.16	28.83	17.50	8.36
Wasteload Allocation (WLA) Components	Permitted Municipal and Industrial Wastewater Facilities*	0.92	0.92	0.92	0.92	0.92
	Permitted Industrial Stormwater Facilities**	NA	NA	NA	NA	NA
	Construction and Industrial Stormwater	0.17	0.05	0.03	0.02	0.01
	Oronoco Township MS4 (2.06% - FUTURE)	3.49	0.95	0.52	0.31	0.14
	Total WLA	4.58	1.92	1.47	1.24	1.07
Load Allocation		165.52	45.02	24.49	14.50	6.45
10% Margin of Safety		18.90	5.22	2.88	1.75	0.84

* See Table 36 of this Decision Document for list of permitted facilities

** No permitted individual stormwater facilities within reach drainage are

Table 27: TMDL summary for the Zumbro River 07040004-971

Zumbro River 07040004-971 TMDL Summary		Flow Regime				
		VHigh	High	Mid	Low	VLow
		Tons/day				
TSS Loading Capacity (TMDL)		87.07	23.12	12.75	6.99	2.84
Wasteload Allocation (WLA) Components	Permitted Municipal and Industrial Wastewater Facilities*	0.25	0.25	0.25	0.25	0.25
	Permi tted Industrial Stormwater Facilities**	NA	NA	NA	NA	NA
	Construction and Industrial Stormwater	0.08	0.02	0.01	0.01	0.003
	MS4***	NA	NA	NA	NA	NA
	Total WLA	0.33	0.27	0.26	0.26	0.25
Load Allocation		78.04	20.53	11.21	6.03	2.31
10% Margin of Safety		8.71	2.31	1.27	0.70	0.28

* See Table 36 of this Decision Document for list of permitted facilities
** No permitted individual stormwater facilities within reach drainage area
*** No current MS4 communities within reach drainage area

Table 28: TMDL summary for Dodge Center Creek 07040004-989

Dodge Center Creek 07040004-989 TMDL Summary		Flow Regime				
		VHigh	High	Mid	Low	VLow
		Tons/day				
TSS Loading Capacity (TMDL)		37.03	9.96	5.72	3.38	1.50
Wasteload Allocation (WLA) Components	Permitted Municipal and Industrial Wastewater Facilities*	0.25	0.25	0.25	0.25	0.25
	Permitted Industrial Stormwater Facilities**	NA	NA	NA	NA	NA
	Construction and Industrial Stormwater	0.03	0.01	0.01	0.003	0.001
	MS4***	NA	NA	NA	NA	NA
	Total WLA	0.28	0.25	0.25	0.25	0.25
Load Allocation		33.05	8.71	4.89	2.80	1.11
10% Margin of Safety		3.70	1.00	0.57	0.34	0.15

* See Table 36 of this Decision Document for list of permitted facilities
** No permitted individual stormwater facilities within reach drainage area
*** No current MS4 communities within reach drainage area

Table 29: TMDL summary for Spring Creek 07040004-568

Spring Creek 07040004-568 TMDL Summary		Flow Regime				
		VHigh	High	Mid	Low	VLow
		Tons/day				
TSS Loading Capacity (TMDL)		2.05	0.62	0.38	0.24	0.11
Wasteload Allocation (WLA) Components	Permitted Municipal and Industrial Wastewater Facilities*	NA	NA	NA	NA	NA
	Permitted Industrial Stormwater Facilities**	NA	NA	NA	NA	NA
	Construction and Industrial Stormwater	0.002	0.001	0.0003	0.0002	0.0001
	MS4***	NA	NA	NA	NA	NA
	Total WLA	0.002	0.001	0.0003	0.0002	0.0001
Load Allocation		1.84	0.56	0.34	0.21	0.10
10% Margin of Safety		0.20	0.06	0.04	0.02	0.01

* No permitted wastewater facilities within reach drainage area
** No permitted individual stormwater facilities within reach drainage area
*** No current MS4 communities within reach drainage area

Table 30: TMDL summary for Spring Creek 07040004-570

Spring Creek 07040004-570 TMDL Summary		Flow Regime				
		VHigh	High	Mid	Low	VLow
		Tons/day				
TSS Loading Capacity (TMDL)		3.97	1.21	0.73	0.46	0.22
Wasteload Allocation (WLA) Components	Permitted Municipal and Industrial Wastewater Facilities*	NA	NA	NA	NA	NA
	Permitted Industrial Stormwater Facilities**	NA	NA	NA	NA	NA
	Construction and Industrial Stormwater	0.004	0.001	0.001	0.0004	0.0002
	MS4***	NA	NA	NA	NA	NA
	Total WLA	0.004	0.001	0.001	0.0004	0.0002
Load Allocation		3.57	1.08	0.66	0.42	0.20
10% Margin of Safety		0.40	0.12	0.07	0.05	0.02

* No permitted wastewater facilities within reach drainage area
** No permitted individual stormwater facilities within reach drainage area
*** No current MS4 communities within reach drainage area

Table 31: TMDL summary for Spring Creek Tributary 07040004-769

Spring Creek 07040004-570 TMDL Summary		Flow Regime				
		VHigh	High	Mid	Low	VLow
		Tons/day				
TSS Loading Capacity (TMDL)		0.09	0.03	0.02	0.01	0.01
Wasteload Allocation (WLA) Components	Permitted Municipal and Industrial Wastewater Facilities*	NA	NA	NA	NA	NA
	Permitted Industrial Stormwater Facilities**	NA	NA	NA	NA	NA
	Construction and Industrial Stormwater	0.004	0.001	0.001	0.0004	0.0002
	MS4***	NA	NA	NA	NA	NA
	Total WLA	0.0001	0.00003	0.00002	0.00001	0.000005
Load Allocation		0.08	0.03	0.02	0.01	0.005
10% Margin of Safety		0.01	0.003	0.002	0.001	0.001

* No permitted wastewater facilities within reach drainage area

** No permitted individual stormwater facilities within reach drainage area

*** No current MS4 communities within reach drainage area