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

MAR 2 8 2017

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 (TMDL) for the Yellow Medicine River Watershed (YMRW), including support documentation and follow up information. The YMRW is in southwestern Minnesota in Lac qui Parle, Lincoln, Lyon, Redwood, and Yellow Medicine Counties. The YMRW TMDLs address impaired aquatic recreation due to excessive nutrients and *E.* coli, and impaired aquatic life use due to excessive sediment (TSS/turbidity).

EPA has determined that the YMRW TMDLs meet the requirements of Section 303(d) of the Clean Water Act and EPA's implementing regulations set forth at 40 C.F.R. Part 130. Therefore, EPA approves Minnesota's twenty-six TMDLs. 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 efforts in submitting these TMDLs and look forward to future TMDL submissions by the State of Minnesota. If you have any questions, please contact Mr. Peter Swenson, Chief of the Watersheds and Wetlands Branch, at 312-886-0236.

Sincerely,

Christopher Korleski
Director, Water Division

Enclosure

cc: Celine Lyman, MPCA

wq-iw7-41g

TMDL: Yellow Medicine River Watershed TMDL, Lac qui Parle, Lincoln, Lyon, Redwood and Yellow Medicine Counties, Minnesota
Date: 03/28/2017

Decision Document for the Approval of the Yellow Medicine River Watershed TMDLs

Section 303(d) of the Clean Water Act (CWA) and EPA's implementing regulations at 40 C.P.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 (chl-a) and phosphorus loadings for excess algae; length of riparian buffer; or number of acres of best management practices.

Comments:

The comments below discuss the waterbodies covered in this TMDL, pollutants of concern in these waterbodies, and Minnesota Pollution Control Agency (MPCA) priority ranking process. This information is found in Sections 1, 3, and 5 of the Yellow Medicine River Watershed (YMRW) TMDL.

Identification of Waterbody

MPCA has submitted a TMDL for the YMRW, located in southwestern Minnesota. The YMRW TMDL document outlines the spatial extent of the watershed in Sections 1.1 and 3 of the TMDL. Figure 1.1 of the TMDL shows the location of the watershed within Minnesota. The YMRW is a predominantly agricultural area with small town centers that are not expected to grow in the future.

The YMRW TMDL addresses twenty-seven impairments, seven of which are shallow polymictic lakes, with the remainder being stream segments. Table 1.1 of the TMDL outlines the assessment units addressed in this TMDL including: assessment unit Id number; designated use; impairments addressed; and year listed as impaired. The impaired assessment units are shown in Figures 3.2, 3.3, and 3.4 of the TMDL for *E. coli*, turbidity, and nutrients respectively. See Table 1 below.

Table 1 – Impairment Summary of the YMRW

Impairments in Addressed in the Yellow Medicine River Watershed TMDL						
Aggregated HUC12 Subwatershed	**Stream Reach Description or Lake Name**	**Assessment Unit ID or MN DNR Lake #**	**Year Listed**	**Affected Designated Use**	**Stressor**	**TMDL**
Hazel Creek- County Ditch No. 9	T115N, R43W, S33 to MN River	07020004-536	2014	Aquatic Recreation	*Escherichia coli*	*E. coli*
Judicial Ditch 10-Wood Lake Creek	Wood Lake outlet to MN River	07020004-547	2014	Aquatic Recreation	*Escherichia coli*	*E. coli*
	Lady Slipper Lake	42-0020-00	2014	Aquatic Recreation	Nutrient Eutrophication	Total P
	Wood Lake	87-0030-00	2010	Aquatic Recreation	Nutrient Eutrophication	Total P
Judicial Ditch 17	CD 3 to YMR	07020004- 622	2014	Aquatic Recreation	*Escherichia coli*	*E. coli*
	Cotton Wood Lake	42-0014-00	2010	Aquatic Recreation	Nutrient Eutrophication	Total P
Lower Yellow Medicine River	S Br YMR to Spring Creek	07020004-513	2014	Aquatic Recreation	*Escherichia coli*	*E. coli*
		07020004-513	2008	Aquatic Recreation/Aquatic Life	Turbidity	TSS
Mud Creek	Headwaters to T114, R43W, S35, south line	07020004-543	2014	Aquatic Recreation	*Escherichia coli*	*E. coli*
North Branch Yellow Medicine River	Steep Bank Lake	41-0082-00	2014	Aquatic Recreation	Nutrient Eutrophication	Total P
South Branch Yellow Medicine River	CD 35 Headwaters to YMR	07020004-503	2002	Aquatic Life	Turbidity	TSS
			1994	Aquatic Recreation	Fecal coliform bacteria	*E. coli*
	JD 29 T111N, R44W, S16 South Line to S Br YMR	07020004-550	2006	Aquatic Recreation	Fecal coliform bacteria	*E. coli*
	T112N, R44W, S20 to T112N, R44W, S26	07020004-595	2014	Aquatic Recreation	*Escherichia coli*	*E. coli*
	T112N, R44W, S26 to T112N, R43W, S18	07020004-597	2006	Aquatic Recreation	Fecal coliform bacteria	*E. coli*
	T112N, R43W, S8 to T113N, R43W, S35	07020004-599	2006	Aquatic Recreation	Fecal coliform bacteria	*E. coli*
	CD 24 to CD 35	07020004-600	2006	Aquatic Recreation	Fecal coliform bacteria	*E. coli*
	Lake Stay	41-0034-00	2014	Aquatic Recreation	Nutrient Eutrophication	Total P
Spring Creek	Headwaters to YMR	07020004-538	2014	Aquatic Recreation	*Escherichia coli*	*E. coli*
Stony Run Creek	T116N, R40W, S30, West Line to MN River	07020004-535	2014	Aquatic Recreation	*Escherichia coli*	*E. coli*
Upper Yellow Medicine River	T113N, R43W, S20 to T113N, R43W, S9	07020004-545	2014	Aquatic Recreation	*Escherichia coli*	*E. coli*
	Headwaters to Mud Creek	07020004-584	2014	Aquatic Recreation	*Escherichia coli*	*E. coli*
			2010	Aquatic Life	Turbidity	TSS
	Perch Lake	41-0067-00	2014	Aquatic Recreation	Nutrient Eutrophication	Total P
Wood Lake Creek - MN river	T114N, R37W, S20, west line to MN River	07020004-555	2014	Aquatic Recreation	*Escherichia coli*	*E. coli*
	Curtis Lake	87-0016-00	2010	Aquatic Recreation	Nutrient Eutrophication	Total P

The YMRW TMDL covers the southwestern portion of the Hawk-Yellow Medicine River basin (HUC code 07020004), comprising approximately 707,000 acres. The YMRW spans the Western Corn Belt Plains (WCBP) and the Northern Glaciated Plains (NGP) ecoregions. Land use statistics are aggregated by related HUC 12s, as shown in Table 3.3 of the TMDL document. The predominant land use of all subwatersheds is cropland (66.7 % - 90.4%) mainly consisting of corn and soybeans. Furthermore, the North and South Branches of Yellow Medicine River as well as the Upper Yellow Medicine River subwatersheds are classified as pasture/hay (21.2%-22.4%) for over a fifth of their land cover. All of the subwatersheds are less than 10% developed (4.4%-6.9%), with populations centers scattered throughout the YMRW.

Pollutants of Concern

The YMRW has seven impairments for nutrient eutrophication, three for turbidity, eleven *Escherichia coli*, and five for fecal coliform bacteria (Table 1.1 of the TMDL). These impairments are addressed by measuring *Escherichia coli*, total suspended solids, and total phosphorus. See the sections below for more details.

Escherichia coli (*E. coli*)

E. coli and fecal coliform bacteria are indicator organisms that are usually associated with harmful organisms transmitted by fecal matter contamination. These organisms can be found in the intestines of warm-blooded animals (humans and livestock). The presence of *E. coli* and fecal coliform bacteria in water suggests the presence of fecal matter associated bacteria, viruses, and protozoa that are pathogenic to humans when ingested. Based on bacteria sampling data collected from April through October (2001-2010), *E. coli* exceedances were found for both the monthly geometric mean and acute criteria for various assessment units in the YMRW (Table 3.4 of the TMDL). Some of the older sampling data for the watershed were for fecal coliform, based upon an older water quality standard. Fecal coliform data was converted to representative *E. coli* data by multiplying by 0.63, the ratio between the 126 *E. coli* geometric mean standard and previous 200 fecal coliform geometric mean standard.

Total Suspended Solids (TSS)

TSS is the concentration of suspended material in the water column as measured by the dried weight of solids filtered from a known volume of water. Suspended material can be present in a variety of forms including detritus, algae, organic matter, etc.; however, fine sediment generally comprises most of the suspended material in streams. Adverse ecological impacts caused by excessive TSS include hampering the ability of aquatic organisms to visually locate food, impaired gill function, and smothering of spawning beds and benthic organism habitat. Transparency tube and turbidity data was collected from April through October (2001-2008), 25% or more of the samples exceeded the 65 mg/L TSS standard (Table 3.5 of the TMDL).

Total Phosphorus (Total P)

Phosphorus is an essential nutrient for aquatic life, but elevated concentrations of Total P can lead to nuisance algal blooms that negatively impact aquatic life and recreation (swimming, boating, fishing, etc.). Excess algae increases turbidity which degrades aesthetics and causes adverse ecological impacts (see above). Algal decomposition depletes oxygen levels which stress aquatic biota (fish and macroinvertebrate species). Oxygen depletion can cause phosphorus release from bottom sediments (i.e. internal loading), which contributes to increased nutrient levels in the water column. Excess phosphorus can alter biological communities by shifting species composition toward organisms better suited to deal with excess phosphorus. Measurements were collected for Total P, chlorophyll a, and secchi disk transparency from June through September in (2010-2011). All arithmetic means of the measurements exceeded targets with the exception of secchi disk transparency for Lake Stay and Perch Lake (Table 3.6 of the TMDL).

Pollutant Sources

The pollutant loads in the YMRW can be attributed to both point and nonpoint sources. There are also "natural" sources of loading identified in the TMDLs. The pollutants and their corresponding sources are broken out below followed by tables of the relevant permitted facilities (Tables 2 and 3 of this Decision Document).

E. coli
MPCA identified several potential sources of *E. coli* that can impact *E. coli* counts within the watershed (see Section 3.6.1 of the YMRW TMDL). The majority of these sources are related to the raising of animals in an agricultural setting, specifically pasture runoff, manure application, and animal feedlots. Additional animal related contamination may come from pet waste runoff and from wildlife scat. Human sources include nine permitted WWTFs, and potential straight pipe/failing septic systems. MPCA estimated that Subsurface Sewage Treatment Systems (SSTSs) non-compliance ranges from 35% to 62% by county. More details on the specific sources can be found below.

Point sources
WWTPs – NPDES permitted facilities may contribute bacteria loads to surface waters through discharges of treated wastewater. Permitted facilities must discharge treated wastewater according to their NPDES permit. MPCA determined that there are nine wastewater treatment facilities (WWTPs) in the YMRW which contribute bacteria from treated wastewater releases (Table 2 of this Decision Document) to segments impaired by bacteria. MPCA assigned each of these facilities a portion of the bacteria wasteload allocation (WLA).

Municipal Separate Storm Sewer System (MS4) Communities – Stormwater from MS4s can transport bacteria to surface water bodies during or shortly after storm events. MPCA determined that the YMRW does not have any MS4 communities which contribute bacteria loads to the YMRW bacteria TMDLs.

Combined Sewer Overflows (CSOs) and Sanitary Sewer Overflows (SSOs) – MPCA did not identify any CSOs or SSOs which contribute bacteria to the *E. coli* impaired segments of the YMRW.

Concentrated Animal Feedlot Operations (CAFOs) – MPCA identified 32 CAFOs in the YMRW (Table 4.2 of the TMDL, Table 3 of this Decision Document). CAFO facilities must be designed to contain all surface water runoff from the production facilities (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 sources
Agriculture – Animal Feeding Operations (AFOs) in close proximity to surface waters can be a source of bacteria to water bodies in the YMRW. These areas may contribute bacteria via the mobilization and transportation of pollutant laden waters from feeding, holding and manure storage sites. These sites are not regulated under the NPDES CAFO permit program. Runoff from agricultural lands may contain significant amounts of bacteria which may lead to impairments in the YMRW. Feedlots generate manure which may be spread onto fields as fertilizer. 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 die-off. Additionally, unrestricted livestock access to streams in pasture areas may add bacteria directly to the surfaces waters or resuspend bacteria laden sediment that had settled on the stream bottom. Direct deposition of animal wastes can result in very high localized bacteria counts and may contribute to downstream impairments. Smaller animal facilities may add bacteria to surface waters via wastewater from these facilities or stormwater runoff from near-stream pastures.

SSTS or Unsewered Communities – Failing septic systems are a potential source of bacteria within the YMRW. Septic systems generally do not discharge directly into a waterbody, but effluents from SSTS may leach into groundwater or pond at the surface where they can be washed into surface waters via stormwater runoff events. Age, construction and use of SSTS can vary throughout a watershed and influence the bacteria contribution from these systems. Furthermore, systems which discharge partially treated sewage to the ground surface, road ditches, tile lines, and directly into streams, rivers and lakes are considered an imminent threat to public health and safety (ITPHS). ITPHS systems also include illicit discharges from unsewered communities.

Wildlife and Pets – Wildlife is a known source of bacteria in water bodies as many animals spend time in or around water bodies. Deer, geese, ducks, raccoons, and other animals all create potential sources of bacteria. Wildlife contributes to the potential impact of contaminated runoff from animal habitats, such as urban park areas, forest, and rural areas. Animal impact can be exacerbated in urban areas with high pet populations and a lack of sanitary disposal of pet waste.

<u>TSS</u>
MPCA specifically identifies several sources of suspended sediment in the YMRW (see Section 3.6.2 of the TMDL). These sources include WWTFs, overland erosion of cultivated lands, and changes in flow regimes which causes increases in scour and bank erosion. MPCA identifies tile drains on agricultural lands as the main cause of hydrologic changes in the YMRW. More details on the specific sources and additional minor sources are identified below.

Point sources
WWTPs – NPDES permitted facilities may contribute sediment to surface waters through discharges of treated wastewater. Permitted facilities must discharge treated wastewater according to their NPDES permit. MPCA determined that there are four wastewater treatment facilities (WWTPs) in the YMRW which contribute sediment (Table 2 of this Decision Document) to segments impaired for TSS. MPCA assigned each of these facilities a portion of the suspended sediment wasteload allocation (WLA). These discharges are not a major source of TSS and the permit limits are well below WQS.

MS4 Communities – Stormwater from MS4s can transport sediment to surface water bodies during or shortly after storm events. MPCA determined that the YMRW does not have MS4 communities which contribute sediment loads to the YMRW TSS TMDLs.

CSOs and SSOs – MPCA did not identify any CSOs or SSOs which contribute sediment to the impaired segments of the YMRW.

CAFOs – MPCA identified thirty-two CAFOs in the YMRW (Table 4.2 of the TMDL, Table 3 of this Decision Document). CAFO facilities must be designed to contain all surface water runoff from the production facilities (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 sources
Overland Erosion – Runoff from agricultural lands may contain significant amounts of sediment which may lead to impairments in the YMRW. 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.

Hydrologic Changes – MPCA has attributed extensive tile draining to the major hydrologic changes in the YMRW. This is exacerbated by channelization efforts. These changes led to eroding riparian areas and streambanks which increase overall soil inputs into the water column. Changes in flow patterns may also encourage down-cutting of the streambed and streambanks. Stream channelization efforts can increase the velocity of flow (via the removal of the sinuosity of a natural channel) and disturb the natural sedimentation processes of the streambed. Additionally, unrestricted livestock access to streams and streambank areas may lead to streambank degradation and sediment additions to stream environments.

Wetland and Forest Sources – Sediment may be added to surface waters by stormwater flows through wetland or forested areas in the YMRW. Storm events may mobilize decomposing vegetation and organic soil particles through the transport of suspended solids and other organic debris.

Atmospheric deposition – Sediment may be added via particulate deposition. Particles from the atmosphere may fall onto surface waters within the YMRW.

Total P

MPCA identified several source categories of phosphorus as contributing to the nutrient impairments of seven impaired lakes within the YMRW, including: SSTS; manure and fertilizer application; erosion; internal load; and atmospheric loading. MPCA determined that there are no point sources discharging phosphorus into the lake subwatersheds. There are no MS4s in the YMRW and none of the WWTFs in the YMRW are in the impaired lakes contributing areas. MPCA attributes the majority of the load to agricultural related practices. Phosphorus sorbs to soil particles, which in turn are eroded into streams and lakes though overland flow or though tile drains. Details on these specific sources and others not mentioned directly in the TMDL can be found below.

Point sources

There are no point sources contributing to the Total P TMDL watersheds.

Nonpoint sources

SSTS or Unsewered Communities– Septic systems generally do not discharge directly into a waterbody, but effluents from SSTS may leach into groundwater or pond at the surface where they can be washed into surface waters via stormwater runoff events. Age, construction and use of SSTS can vary throughout a watershed and influence the nutrient contribution from these systems. MPCA estimated that the SSTS non-compliance rate ranges from 35% to 62% by county.

Manure and Fertilizer Application – Runoff from agricultural lands may contain significant amounts of nutrients, organic material and organic-rich sediment which may lead to impairments in the YMRW. 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. Stormwater runoff may contribute nutrients and organic-rich sediment to surface waters from livestock manure, fertilizers, vegetation and erodible soils. This nutrient laden stormwater can also come from urban areas where phosphorus and phosphorus-rich organic matter (grass clippings, etc.) run off into waterways. Furthermore, livestock with direct access to a waterway can directly deposit nutrients via animal wastes into a waterbody, which may result in very high localized nutrient concentrations. This nutrient deposition may also contribute to downstream impairments.

Erosion and Channel Destabilization – Overland erosion of sediment can be major source of Total P for the above reasons. Furthermore, eroding streambanks and channelization efforts may add nutrients, organic material and organic-rich sediment to local surface waters. Nutrients may be added if there is particulate phosphorus bound with eroding soils. Eroding riparian areas may be linked to soil inputs within the water column and potentially to changes in flow patterns. Changes in flow patterns may also intensify down-cutting of the streambed and streambanks. Stream channelization efforts can increase the velocity of flow (via the removal of the sinuosity of a natural channel) and disturb the natural sedimentation processes of the streambed. This problem can be exacerbated by livestock with direct access to stream environments, which may add nutrients directly to the surface waters or resuspend particles that had settled on the stream bottom.

Internal Loading – The release of phosphorus from lake sediments via physical disturbance from benthic fish (rough fish, ex. carp), the release of phosphorus from wind mixing the water column, and the release of phosphorus from decaying curly-leaf pondweeds, may all contribute internal phosphorus loading to the lakes of the YMRW. 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.

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

Groundwater Discharge – Phosphorus can be added to the lake's water column through groundwater discharge. Phosphorus concentrations in groundwater are usually below the water quality standards for phosphorus. Instances where significant groundwater discharge into lake environments is occurring, phosphorus inputs can impact the phosphorus budgeting of the waterbody.

Wetland and Forest Sources – Phosphorus, organic material and organic-rich sediment may be added to surface waters by stormwater flows through wetland and forested areas in the YMRW. Storm events may mobilize phosphorus through the transport of suspended solids and other organic debris.

Wildlife and Pets – Wildlife is a known source of nutrients 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 nutrients from animal waste. Wildlife contributes to the potential impact of contaminated runoff from animal habitats, such as urban park areas, forest, and rural areas. This impact may be increased in urban areas with high pet populations and improper pet waste disposal.

Upstream Contributions – Upstream lakes may contribute nutrient, organic material and organic-rich sediment loads via water flow between hydrologically connected upstream and downstream lake systems. Upstream lakes may contribute nutrient loads to downstream lakes via non-regulated stormwater runoff into the upstream lakes, nutrient contributions from wetland areas and forested areas into the upstream lakes, internal loading in upstream lakes, etc. These sources can all add nutrients to hydrologically connected downstream lakes and waters.

Table 2 – YMRW WWT

Wastewater Treatment Facilities in the Yellow Medicine River Watershed			
Aggregated HUC12 Subwatershed	**Stream Reach AUID #**	**Facility**	**Permit #**
Hazel Creek- County Ditch No. 9	07020004-536	Clarkfield WWTF	MNG440401
Judicial Ditch 10-Wood Lake Creek	07020004-547	Cottonwood WWTF	MNG580010
		Wood Lake WWTF	MNG580107
Wood Lake Creek - MN river	07020004-555	Echo WWTF	MNG490046
Lower Yellow Medicine River	07020004-513	Ivanhoe WWTF	MNG580103
		Minnesota WWTF	MNG580033
		Porter WWTF	MNG580128
		Taunton WWTF	MNG580090
Upper Yellow Medicine River	07020004-545	Taunton WWTF	MNG580090
	07020004-584	Ivanhoe WWTF	MNG580103
South Branch Yellow Medicine River	07020004-503	Minnesota WWTF	MNG580033
Spring Creek	07020004-538	Saint Leo WWTF	MN0024775
Wood Lake Creek - MN river	07020004-555	Echo WWTF	MNG490046

Table 3 –YMRW CAFOs

NPDES Permitted Concentrated Animal Feeding Operations in the YMRW		
Aggregated HUC12 Subwatershed	**Feedlot Name**	**Permit #**
Hazel Creek- County Ditch No. 9	Christensen Farms Site C071	MNG440401
	Paul Syring Farm	MNG440951
Judicial Ditch 10-Wood Lake Creek	L & N Hog Farms	MNG440561
	Ben and Mike Hinz Farm	MNG441226
	Tim Schlenner Farm 17	MNG441184
	Dave Schwerin - Site 3	MNG441229
Judicial Ditch 17	Allied Dairy LLP	MNG440248
Lower Yellow Medicine River	Plainview Farms Inc	MNG440339
	Buysse Inc - Crestview Farm	MNG440731
	Hentges Family Farm	MNG440456
	Stevens Farms LLP	MNG440796
Mud Creek	Mike Verhelst Farm	MNG441144
Sacred Heart Creek - MN River	Christensen Farms Site F148	MNG440281
	Hentges Finisher	MNG441285
	Jordan Hog Finishing Site	MNG440316
South Branch Yellow Medicine River	Prairieview Pork Inc	MNG440058
	Guy Jeremiason Farm - South	MNG440287
	Kevin R Leibfried Farm	MNG440462
	Pat & Sharon Hennen	MNG440144
	John Wambeke Farm	MNG441283
Spring Creek	Rob Hill Farms Inc	MNG440759
	Christensen Farms Site C072	MNG440125
	Richard Nuytten Farm	MNG440426
	Christensen Farms Site C073	MNG440519
Stony Run Creek	Patrick W McCoy Hog Barns	MNG440430
Stony Run Creek - MN River	Montevideo Farms Inc	MNG440843
	Sundlee Pork Inc	MNG440970
Upper Yellow Medicine River	Christensen Farms Site F068	MNG440665
	Steve Citterman Farm	MNG440461
Wood Lake Creek - MN river	Pederson Pork Farm	MNG441085
	Jon Busack Farm	MNG441308
	Kvistad Farms Inc	MNG441052

Priority Ranking

MPCA monitors and assesses Minnesota's major watersheds on a 10-year cycle. The monitoring cycle dictates the order that TMDLs are completed for any impaired waterbodies. The most recent listings in this TMDL are those found in the 2014 draft 303(d) list of impaired waterbodies (Section 1.3 of the TMDL)

EPA finds that the TMDL document submitted by 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)(l)). 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.

<u>Comments:</u>
The YMRW TMDL addresses twenty-seven impairments, three for aquatic life use and twenty-four for aquatic recreation (Table 1.1 of the TMDL). Section 2 of the TMDL lists the applicable water quality standards (WQS). The impaired assessment units are shown in Figures 3.2, 3.3, and 3.4 of the TMDL for *E. coli*, turbidity (TSS), and nutrients (Total P) respectively. Table 1 of this Decision Document lists the impairments and their associated pollutants.

Designated Use

WQS are the fundamental benchmarks by which the quality of surface waters is measured. Within the State of Minnesota, WQS are developed pursuant to the Minnesota Statutes Chapter 115, Sections 03 and 44. Authority to adopt rules, regulations, and standards as are necessary and feasible to protect the environment and health of the citizens of the State is vested with the MPCA. Through adoption of WQS into Minnesota's administrative rules (principally Chapters 7050 and 7052), MPCA has identified designated uses to be protected in each of its drainage basins and the criteria necessary to protect these uses. See Section 2 of the TMDL.

Minnesota Rule Chapter 7050 designates uses for waters of the state. The segments addressed by the YMRW TMDL are designated as Class 2 waters for aquatic recreation use (fishing, swimming, boating, etc.) and aquatic life use. The Class 2 designated use is as follows:

> "*Aquatic life and recreation includes all waters of the state that support or may support fish, other aquatic life, bathing, boating, or other recreational purposes and for which quality control is or may be necessary to protect aquatic or terrestrial life or their habitats or the public health, safety, or welfare.*"[1]

Narrative Criteria

The streams and rivers are listed as impaired for aquatic recreation and/or aquatic life use. The lakes are listed as impaired for aquatic recreation. All waters fall under the Class 2B waters designated use, the

[1] Use classification 2B waters (Minn. R. 7050.0140, Subp 3)

applicable narrative criteria states:

> *"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 fish 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. This class of surface water is not protected as a source of drinking water."*[2]

Numeric Criterion

Table 4 –Minnesota Water Quality Standards

Applicable Water Quality Standards				
Parameter	**Water Quality Standard**	**Units**	**Criteria**	**Applicable Time Period**
Escherichia coli - Class 2 waters	Not to exceed 126	org/100 mL	Monthly geometric mean of a least 5 samples within one calendar year	April 1st – October 31st
	Not to exceed 1,260	org/100 mL	Monthly upper 10th percentile	
TSS Class 2 Waters	Not to Exceed 65	TSS mg/L	No more than 10% of total samples	April 1st – September 30ith
Total P - NGP & WCBP Shallow Lakes	Less than 90	P µg/L	Concentration should not exceed	June 1st – September 30ith
	Less than 30	Chlorophyll-α µg/L	Concentration should not exceed	
	Greater than 0.7	meters	Secci depth measurement should exceed	

E. coli

The applicable numeric criteria for the waters of the YMRW are in Table 4 of this Decision Document. The focus of this TMDL is on the 126 organisms (orgs) per 100 mL (126 orgs/100 mL) geometric mean portion of the standard. MPCA believes that using the 126 orgs/100 mL portion of the standard for TMDL calculations will result in the greatest bacteria reductions within the YMRW, and will result in the attainment of the 1,260 orgs/100 mL portion of the standard. While the bacteria TMDLs will focus on the geometric mean portion of the water quality standard, attainment of both criteria of the water quality standard is required.

TSS

When the YMRW was assessed the applicable water quality standard was the statewide criterion of 25 nephelometric turbidity units (NTUs). On January 23, 2015, EPA approved MPCA's regionally-based TSS criteria for rivers and streams to replace the NTU standard. The old standard measured light scatter and absorption, and therefore could not be applied as a daily load target. To compensate a regional TSS criteria was developed to more accurately address the turbidity impairments.[3] The southern Minnesota standard is a maximum of 65 mg/L not to be exceeded more than 10% of the time over a multiyear period. The 65 mg/L criterion applies to all of the TSS TMDLs in the YMRW (Table 4 of this Decision Document).

Total P

[2] Narrative criteria class 2B waters (Minn. R. 7050.0222, subp. 4.)

[3] MPCA's Aquatic Life Water Quality Standard Draft Technical Support Document for Total Suspended Solids (Turbidity) (May 2011) – https://www.pca.state.mn.us/sites/default/files/wq-s6-11.pdf

Numeric criteria for Total P, chlorophyll-*a*, and Secchi Disk (SD) depth in lakes are set forth in Minnesota Rules 7050.0222. These three parameters form MPCA eutrophication standard that must be achieved to attain the aquatic recreation designated use. The numeric eutrophication standards which are applicable to the YMRW lake TMDLs are found in Table 4 of this Decision Document. By evaluating multiple lakes in multiple ecoregions MPCA has stated that achieving these phosphorus targets will also achieve the targets for SD depth and chlorophyll-*a*.[4]

In developing the lake nutrient standards for Minnesota lakes, 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, Total P, and the response variables, chl-*a* and SD depth. MPCA anticipates that by meeting the Total P concentration of 90 µg/L the response variables chl-*a* and SD will be attained and the lakes addressed by the YMRW lake TMDLs will achieve their designated beneficial uses. For lakes to achieve their designated beneficial use, the lake must not exhibit signs of eutrophication and must allow water-related recreation, fishing and aesthetic enjoyment. MPCA views the control of eutrophication as the lake enduring minimal nuisance algal blooms and exhibiting desirable water clarity.

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)(l)). 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 = ΣWLA + ΣLA + MOS + RC, where: LC is the loading capacity; WLA is the wasteload allocation; LA is the load allocation; MOS

[4] Minnesota Lake Water Quality Assessment report: Developing Nutrient Criteria (September 2005) – https://www.pca.state.mn.us/sites/default/files/lwq-a-nutrientcriteria.pdf

is the margin of safety; and (pursuant to MPCA rules) RC is any reserve capacity set aside for future growth. In the YMRW TMDLs MPCA did not set aside any RC as they do not anticipate future growth in the YMRW. The TMDLs for the YMRW can be broken down into two different approaches both of which utilize a Hydrologic Simulation Program FORTRAN (HSPF) model to determine flow: (1) A load duration curve (LDC) approach for the stream segment TMDLs (to determine TSS and *E. coli* loads); (2) a conventional daily load mass balance approach for the lake (Total P) TMDLs. These lake TMDLs apply the BATHTUB model approach using the HSPF spatially relevant 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 sections below and in Section 4.7 and Appendices A-C 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.[5,6] The output of the HSPF process is a model of multiple hydrologic response units (HRUs), or subwatersheds of the overall YMRW. These HRUs compute flow and loading for their respective areas based off calibration for area specific criteria and calibration to the overall model's pour point (US Geological Survey gaging station 05313500). According to MPCA in Section 4.5 of the TMDL, the HSPF "was calibrated and validated using 17 years (1996 through 2012) of flow data from USGS gaging station 05313500 and 11 years (1999 through 2009) of water chemistry data."

BATHTUB

MPCA used the U.S. Army Corps of Engineers (USACE) BATHTUB model to calculate the loading capacities for lake Total P TMDLs. BATHTUB is a model for lakes and reservoirs (surficial depressions with retention times greater than two weeks) 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".[7] This TMDL uses the BATHTUB model to link observed phosphorus water quality conditions and modeled phosphorus loading to in-lake water quality estimates. BATHTUB is a steady-state annual or seasonal model that predicts a lake's growing season (June 1 to September 30) average surface water quality. BATHTUB utilizes annual or seasonal time-scales which are appropriate because watershed Total P loads are normally impacted by seasonal conditions.

BATHTUB has built-in statistical calculations which account for data variability and provide a means for estimating confidence in model predictions. BATHTUB employs a mass-balance Total P model that accounts for water and Total P inputs from tributaries, direct watershed runoff, the atmosphere, sources internal to the lake, outputs through the lake outlet, water loss via evaporation, and Total P sedimentation and retention in the lake sediments. BATHTUB allows the user the choice of several different mass-balance Total P models for estimating loading capacity. BATHTUB provides flexibility to tailor model inputs to specific lake morphometry,

[5] HSPF User's Manual - https://water.usgs.gov/software/HSPF/code/doc/hspfhelp.zip
[6] EPA TMDL Models Webpage - https://www.epa.gov/exposure-assessment-models/tmdl-models-and-tools
[7] BATHTUB Manual - http://www.wwwalker.net/bathtub/help/bathtubWebMain.html

watershed characteristics and watershed inputs. The BATHTUB model also allows MPCA to assess impacts of changes in nutrient loading from the various sources.

The loading capacity of the lakes were determined through the use of BATHTUB and the Canfield-Bachmann subroutine and then allocated to the WLA, LA, and MOS. To simulate the load reductions needed to achieve the WQS, a series of model simulations were performed. Each simulation reduced the total amount of Total P entering each of the water bodies during the growing season (June 1 through September 30) and computed the anticipated water quality response within the lake. The goal of the modeling simulations was to identify the loading capacity appropriate (i.e., the maximum allowable load to the system, while allowing it to meet WQS) from June 1 to September 30. The modeling simulations focused on reducing the Total P to the system.

The BATHTUB modeling efforts were used to calculate the loading capacity for each lake. The loading capacity is the maximum phosphorus load which each of these water bodies can receive over an annual period and still meet the shallow and general lake nutrient WQS. Loading capacities were calculated to meet the WQS during the growing season (June 1 through September 30). This time period of June to September was chosen by MPCA because it corresponds to the eutrophication criteria, which contains the months that the general public typically uses lakes in the YMRW 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. Loading capacities were divided by 365 to calculate the daily loading capacities.

Loading capacities were determined using Canfield-Bachmann equations from BATHTUB. The model equations were originally developed by the US Army Corps of Engineers (USACE) from data taken from over 40 lakes. 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.[8]

EPA concurs with use of and BATHTUB approach to determine loading capacities, wasteload allocations, load allocations and the margin of safety for the Total P TMDLs.

LDC

Flow Duration Curve (FDC) graphs have flow duration interval (percentage of time flow exceeded) on the X-axis and discharge (flow per unit time) on the Y-axis. For the YMRW TSS and *E. coli* TMDLs FDCs were generated from the spatially relevant flow generated by their HSPF HRUs. The FDC were transformed into LDC by multiplying individual flow values by the WQS and then multiplying that value by a conversion factor. The resulting points are plotted onto a LDC graph. LDC graphs, have flow duration interval (percentage of time flow exceeded) on the X-axis and the pollutant load (or count of colonies for *E. coli*) on the Y-axis. The curved line on a LDC graph represents the TMDL of the respective flow conditions observed at that location.

Water quality monitoring was completed in the YMRW and measured pollutant concentrations were converted to individual sampling loads by multiplying the sample concentration by the instantaneous

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

flow measurement observed/estimated at the time of sample collection. The individual sampling loads were plotted on the same figure with the created LDC. Individual LDCs are found in Appendix A of the TMDL document.

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

The LDC TMDL tables in this Decision Document report five points (the midpoints of the designated flow regime) on the loading capacity curve. However, it should be understood that the components of the TMDL equation could be illustrated for any point on the entire loading capacity curve. The LDC method can be used to display pollutant monitoring data and allows for the estimation of load reductions necessary for attainment of the appropriate WQS. Using this method, daily loads were developed based upon the flow in the waterbody. Loading capacities were determined for the segment from multiple flow regimes. This creates a TMDL that represents the allowable daily load across all flow conditions. The TMDL tables identify the loading capacity for the waterbody at each flow regime. Although there are numeric loads for each flow regime, the LDC is what is being approved as a TMDL.

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. The LDC approach is useful in determining loading capacities, wasteload allocations, load allocations and the margin of safety for *E. coli* and TSS TMDLs. The methods used are consistent with U.S. EPA technical memos.[9]

E. coli

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".[10] To establish the loading capacities for the YMRW *E. coli* TMDLs, MPCA used Minnesota's WQS for *E. coli* (in orgs/mL). A loading capacity is,

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[9] An Approach for Using Load Duration Curves in the Development of TMDLs
https://www.epa.gov/sites/production/files/2015-07/documents/2007_08_23_tmdl_duration_curve_guide_aug2007.pdf

[10] 40 CFR §130.2

"the greatest amount of loading that a water can receive without violating water quality standards."[11] 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 waterbody. If all sources meet the WQS at discharge, then the waterbody should meet the WQS and the designated use.

MPCA uses the geometric mean for *E. coli* counts to calculate loading capacity values for the *E. coli* TMDLs (126 orgs/100 mL). MPCA believes the geometric mean of the WQS provides the best overall characterization of the status of the watershed. EPA agrees with this assertion, as stated in the preamble of, "The WQS for Coastal and Great Lakes Recreation Waters Final Rule", "…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."[12] MPCA stated that the *E. coli* TMDLs will focus on the geometric mean portion of the WQS (126 orgs/100 mL) and that it expects that by attaining the 126 orgs/100 mL portion of the *E. coli* WQS the 1,260 orgs/100 mL portion of the *E. coli* WQS will also be attained. EPA finds these assumptions to be reasonable.

In addition to using the geometric mean, MPCA structures their WQS to reflect when there is the highest potential of contact (spring though summer). By targeting this critical exposure period MPCA can achieve the greatest overall protection. As for flow there is no observed critical period of flow as excess loading occurs throughout the historical flow regime. The lack of midrange and low flow data could be influencing this assumption for the Lower Yellow Medicine River (AUID 07020004-513), South Branch Yellow Medicine River (AUID 07020004-600), and Spring Creek (AUID 07020004-538). The South Branch Yellow Medicine River (AUID 07020004-503, 595, 597,599) all show 100% exceedance under very low flow conditions.

The YMRW *E. coli* TMDLs are shown to have anywhere from 21 - 94% reduction in loading to achieve the various TMDLs (Table 4.2 of the TMDL). These reductions will be achieved by reducing the sources outlined in the Pollutant Sources section of this decision document. Reasonable assurance that the nonpoint source reductions will be achieved is outlined in Section 8 of this decision document.

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

The TMDL tables for all of the *E. coli* TMDLs are found below and in Section 4.7.1, Bacteria Impaired Stream Reach Loading Capacities, of the TMDL.

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[11] 40 CFR §130.2

[12] 69 FR 67218-67243 (November 16, 2004) – https://www.gpo.gov/fdsys/pkg/FR-2004-11-16/html/04-25303.htm

E. coli TMDL Tables

Table 5 – YMRW E. coli TMDL 1

***E. coli* (Billion organisms per day)**					
Hazel Creek - County Ditch No. 9 Township 115N, Range 43W, Section. 33 to Minnesota River AUID# 07020004-536					
Pollutant Source	**Very High**	**High**	**Mid**	**Low**	**Very Low**
Average Daily Loading Capacity***	364.3	73.7	21.3	4.1	0.03
Margin of Safety	36.4	7.4	2.1	0.4	0.003
Wasteload Allocation					
City of Clarkfield Wastewater Treatment Facility	13.99	13.99	13.99	**	**
Livestock facilities requiring NPDES permits	0	0	0	0	0
"Straight Pipe" Septic Systems	0	0	0	0	0
Load Allocation					
Total Load Allocation	313.9	52.3	5.2	**	**

Table 6 – YMRW E. coli TMDL 2

***E. coli* (Billion organisms per day)**					
Wood Lake Creek - Judicial Ditch 10 Wood Lake outlet to Minnesota River AUID# 07020004-547					
Pollutant Source	**Very High**	**High**	**Mid**	**Low**	**Very Low**
Average Daily Loading Capacity***	240.3	55.4	12	1.1	0.03
Margin of Safety	24	5.5	1.2	0.1	0.003
Wasteload Allocation					
City of Cottonwood Wastewater Treatment Facility	8.83	8.83	8.83	**	**
City of Wood Lake Wastewater Treatment Facility	1.71	1.71	1.71	**	**
Livestock facilities requiring NPDES permits	0	0	0	0	0
"Straight Pipe" Septic Systems	0	0	0	0	0
Load Allocation					
Total Load Allocation	205.8	39.4	0.26	**	**

Table 7 – YMRW E. coli TMDL 3

***E. coli* (Billion organisms per day)**					
Judicial Ditch 17 County Ditch 3 to Yellow Medicine River AUID# 07020004-622					
Pollutant Source	**Very High**	**High**	**Mid**	**Low**	**Very Low**
Average Daily Loading Capacity***	264.7	65.7	18.2	4.4	0.03
Margin of Safety	26.5	6.6	1.8	0.4	0.003
Wasteload Allocation					
Livestock facilities requiring NPDES permits	0	0	0	0	0
"Straight Pipe" Septic Systems	0	0	0	0	0
Load Allocation					
Total Load Allocation	238.2	59.1	16.4	4.1	0.027

Table 8 – YMRW E. coli TMDL 4

***E. coli* (Billion organisms per day)**					
Lower Yellow Medicine River South Branch Yellow Medicine River to Spring Creek AUID# 07020004-513					
Pollutant Source	**Very High**	**High**	**Mid**	**Low**	**Very Low**
Average Daily Loading Capacity***	2312.2	500.2	131.7	16.1	0.03
Margin of Safety	231.2	50	13.2	1.6	0.003
Wasteload Allocation					
City of Ivanhoe Wastewater Treatment Facility	2.6	2.6	2.6	2.6	**
City of Minneota Wastewater Treatment Facility	8.5	8.5	8.5	8.5	**
City of Porter Wastewater Treatment Facility	0.8	0.8	0.8	0.8	**
City of Taunton Wastewater Treatment Facility	0.9	0.9	0.9	0.9	**
Livestock facilities requiring NPDES permits	0	0	0	0	0
"Straight Pipe" Septic Systems	0	0	0	0	0
Load Allocation					
Total Load Allocation	2068.1	437.3	105.6	1.6	**

Table 9 – YMRW E. coli TMDL 5

E. coli (Billion organisms per day)					
Mud Creek Headwaters to Township 114N, Range 43W, Section 35, South Line AUID# 07020004-543					
Pollutant Source	**Very High**	**High**	**Mid**	**Low**	**Very Low**
Average Daily Loading Capacity***	333.3	75.6	18.6	2.3	0.03
Margin of Safety	33.3	7.6	1.9	0.2	0.003
Wasteload Allocation					
City of Porter Wastewater Treatment Facility	0.78	0.78	0.78	0.78	**
Livestock facilities requiring NPDES permits	0	0	0	0	0
"Straight Pipe" Septic Systems	0	0	0	0	0
Load Allocation					
Total Load Allocation	299.2	67.2	15.9	1.32	**

Table 10 – YMRW E. coli TMDL 6

E. coli (Billion organisms per day)					
South Branch Yellow Medicine River AUID# 07020004-503					
Pollutant Source	**Very High**	**High**	**Mid**	**Low**	**Very Low**
Average Daily Loading Capacity***	660.7	130.5	26.1	0.03	0.03
Margin of Safety	66.1	13.1	2.6	0.003	0.003
Wasteload Allocation					
City of Minneota Wastewater Treatment Facility	8.5	8.5	8.5	**	**
Livestock facilities requiring NPDES permits	0	0	0	0	0
"Straight Pipe" Septic Systems	0	0	0	0	0
Load Allocation					
Total Load Allocation	586.1	108.9	15	**	**

Table 11 – YMRW E. coli TMDL 7

E. coli (Billion organisms per day)					
South Branch Yellow Medicine River – JD 29 Township 111N, Range 44W, Section 16, South Line to South Branch Yellow Medicine River AUID# 07020004-550					
Pollutant Source	**Very High**	**High**	**Mid**	**Low**	**Very Low**
Average Daily Loading Capacity***	168.8	34.1	9.1	2.6	0.2
Margin of Safety	16.9	3.4	0.9	0.3	0.02
Wasteload Allocation					
Livestock facilities requiring NPDES permits	0	0	0	0	0
"Straight Pipe" Septic Systems	0	0	0	0	0
Load Allocation					
Total Load Allocation	151.9	30.7	8.2	2.3	0.18

Table 12 – YMRW E. coli TMDL 8

E. coli (Billion organisms per day)					
South Branch Yellow Medicine River Township 112N, Range 44W, Section 20 to Township 113N, Range 43W, Section 35 AUID# 07020004-595, -597, -599					
Pollutant Source	**Very High**	**High**	**Mid**	**Low**	**Very Low**
Average Daily Loading Capacity***	91.6	14.1	2.9	0.03	0.03
Margin of Safety	9.2	1.4	0.3	0.003	0.003
Wasteload Allocation					
Livestock facilities requiring NPDES permits	0	0	0	0	0
"Straight Pipe" Septic Systems	0	0	0	0	0
Load Allocation					
Total Load Allocation	82.4	12.7	2.6	0.027	0.027

Table 13 – YMRW E. coli TMDL 9

E. coli (Billion organisms per day)					
South Branch Yellow Medicine River County Ditch 24 to County Ditch 35 AUID# 07020004-600					
Pollutant Source	**Very High**	**High**	**Mid**	**Low**	**Very Low**
Average Daily Loading Capacity***	162.2	33.1	8.4	1.4	0.005
Margin of Safety	16.2	3.3	0.8	0.1	0.0005
Wasteload Allocation					
Livestock facilities requiring NPDES permits	0	0	0	0	0
"Straight Pipe" Septic Systems	0	0	0	0	0
Load Allocation					
Total Load Allocation	146	29.8	7.6	1.3	0.0045

Table 14 – YMRW E. coli TMDL 10

E. coli (Billion organisms per day)					
Spring Creek Headwaters to Yellow Medicine River AUID# 07020004-538					
Pollutant Source	**Very High**	**High**	**Mid**	**Low**	**Very Low**
Average Daily Loading Capacity***	706.4	151	39.2	5.5	0.03
Margin of Safety	70.6	15.1	3.9	0.6	0.003
Wasteload Allocation					
City of St. Leo Wastewater Wastewater Treatment Facility	0.68	0.68	0.68	0.68	**
Livestock facilities requiring NPDES permits	0	0	0	0	0
"Straight Pipe" Septic Systems	0	0	0	0	0
Load Allocation					
Total Load Allocation	635.1	135.2	34.6	4.22	**

Table 15 – YMRW E. coli TMDL 11

E. coli (Billion organisms per day)					
Stony Run Creek Township 116N, Range 40W, Section 30, West Line to Minnesota River AUID# 07020004-535					
Pollutant Source	**Very High**	**High**	**Mid**	**Low**	**Very Low**
Average Daily Loading Capacity***	301.1	52.7	14.2	2.8	0.03
Margin of Safety	30.1	5.3	1.4	0.3	0.003
Wasteload Allocation					
Livestock facilities requiring NPDES permits	0	0	0	0	0
"Straight Pipe" Septic Systems	0	0	0	0	0
Load Allocation					
Total Load Allocation	271	47.4	12.8	2.5	0.027

Table 16 – YMRW E. coli TMDL 12

E. coli (Billion organisms per day)					
Upper Yellow Medicine River Township 113N, Range 43W, Section 20 to Township 113N, Range 43W, Section 9 AUID# 07020004-545					
Pollutant Source	**Very High**	**High**	**Mid**	**Low**	**Very Low**
Average Daily Loading Capacity***	143.9	23.2	5.9	0.8	0.03
Margin of Safety	14.4	2.3	0.6	0.08	0.003
Wasteload Allocation					
City of Taunton Wastewater Treatment Facility	0.93	0.93	0.93	**	**
Livestock facilities requiring NPDES permits	0	0	0	0	0
"Straight Pipe" Septic Systems	0	0	0	0	0
Load Allocation					
Total Load Allocation	128.6	20	4.4	**	**

Table 17 – YMRW E. coli TMDL 13

E. coli (Billion organisms per day)					
Upper Yellow Medicine River Headwaters to Mud Creek AUID# 07020004-584					
Pollutant Source	**Very High**	**High**	**Mid**	**Low**	**Very Low**
Average Daily Loading Capacity***	672.2	118.5	32.7	4	0.03
Margin of Safety	67.2	11.9	3.3	0.4	0.003
Wasteload Allocation					
City of Taunton Wastewater Treatment Facility	0.93	0.93	0.93	0.93	**
City of Ivanhoe Wastewater Treatment Facility	2.64	2.64	2.64	2.64	**
Livestock facilities requiring NPDES permits	0	0	0	0	0
"Straight Pipe" Septic Systems	0	0	0	0	0
Load Allocation					
Total Load Allocation	601.4	103	25.8	0.03	**

Table 18 – YMRW E. coli TMDL 14

E. coli (Billion organisms per day)					
Wood Lake Creek-MN River T114N, R37W, S20, west line to Minnesota R AUID# 07020004-555					
Pollutant Source	**Very High**	**High**	**Mid**	**Low**	**Very Low**
Average Daily Loading Capacity***	122.8	25.6	6.5	0.9	0.03
Margin of Safety	12.3	2.6	0.7	0.1	0.003
Wasteload Allocation					
City of Echo Wastewater Treatment Facility	3.1	3.1	3.1	**	**
Livestock facilities requiring NPDES permits	0	0	0	0	0
"Straight Pipe" Septic Systems	0	0	0	0	0
Load Allocation					
Total Load Allocation	107.4	19.9	2.7	**	**

**WWTF design/discharge flow exceeded low flow, therefore allocation = (flow contribution from a given source) x (126 org/100ml). See Section 4.3 of the Final TMDL for details.
*** Values may be rounded.

TSS

MPCA developed LDCs to calculate the TSS TMDLs for the YMRW. The same LDC development strategies were employed for the sediment as those for the *E.* coli TMDLs. The FDC were transformed into LDC by multiplying individual flow values by the numeric criteria (65 mg/L) and then multiplying that value by a conversion factor.

The LDC method can be used to display collected sediment monitoring data and allows for the estimation of load reductions necessary for attainment of the Class 2B TSS WQS. Using this method, daily loads were developed based upon the flow in the waterbody. Loading capacities were determined for each segment for multiple flow regimes. This allows the TMDL to be represented by an allowable daily load across all flow conditions. The tables at the end of this section show the loading capacity for each segment all flow regimes. Although there are numeric loads for each flow regime, the LDC is what is being approved as a TMDL.

MPCA determined that the TSS LDCs also show that the main concern for TSS is higher flows from flashy storms. The YMRW TMDL LDCs show that all three TSS assessment units have exceedances of the WQS in the very high flow range. the Lower Yellow Medicine River (AUID 07020004-513) shows exceedances during very high and high flow periods and the South Branch Yellow Medicine River (AUID 07020004-503) appears to have more general exceedances in the greater than 50% flow range.

The YMRW TSS TMDLs are shown to have anywhere from 45 – 52% reduction in loading to achieve the various TMDLs (Table 4.4 of the TMDL). These reductions will be achieved by reducing the sources outlined in the Pollutant Sources section of this decision document. Reasonable assurance that the nonpoint source reductions will be achieved is outlined in Section 8 of this decision document.

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

The TMDL tables for all of the TSS TMDLs are found below and in Section 4.7.2, Turbidity (TSS) Impaired Stream Reach Loading Capacities, of the TMDL document.

TSS TMDL Tables

Table 19 – YMRW TSS TMDL 1

TSS (tons per day)					
Lower Yellow Medicine River - South Branch Yellow Medicine River to Spring Creek AUID# 07020004-513					
Pollutant Source	**Very High**	**High**	**Mid**	**Low**	**Very Low**
Average Daily Loading Capacity**	147	31	8.5	1.2	0.002
Margin of Safety	14.7	3.1	0.9	0.1	0.0002
Wasteload Allocation					
City of Ivanhoe Wastewater Treatment Facility	0.02	0.02	0.02	0.02	*
City of Minneota Wastewater Treatment Facility	0.07	0.07	0.07	0.07	*
City of Porter Wastewater Treatment Facility	0.01	0.01	0.01	0.01	*
City of Taunton Wastewater Treatment Facility	0.01	0.01	0.01	0.01	*
Livestock facilities requiring NPDES permits	0	0	0	0	0
"Straight Pipe" Septic Systems	0	0	0	0	0
Construction and Industrial Stormwater 1%	1.3	0.3	0.08	0.01	*
Load Allocation					
Total Load Allocation	130.9	27.5	7.42	0.99	*

Table 20 – YMRW TSS TMDL 2

TSS (tons per day)					
South Branch Yellow Medicine River – County Ditch 35 Headwaters to Yellow Medicine River AUID# 07020004-503					
Pollutant Source	**Very High**	**High**	**Mid**	**Low**	**Very Low**
Average Daily Loading Capacity**	42	7.9	1.8	0.002	0.002
Margin of Safety	4.2	0.8	0.2	0.0002	0.0002
Wasteload Allocation					
City of Minneota Wastewater Treatment Facility	0.07	0.07	0.07	*	*
Livestock facilities requiring NPDES permits	0	0	0	0	0
"Straight Pipe" Septic Systems	0	0	0	0	0
Construction and Industrial Stormwater 1%	0.4	0.07	0.03	*	*
Load Allocation					
Total Load Allocation	37.33	7	1.5	*	*

Table 21 – YMRW TSS TMDL 3

TSS (tons per day)					
Lower Yellow Medicine River - South Branch Yellow Medicine River to Spring Creek AUID# 07020004-513					
Pollutant Source	**Very High**	**High**	**Mid**	**Low**	**Very Low**
Average Daily Loading Capacity**	40.5	7.3	2.1	0.3	0.002
Margin of Safety	4.1	0.7	0.2	0.03	0.0002
Wasteload Allocation					
City of Ivanhoe Wastewater Treatment Facility	0.02	0.02	0.02	0.02	*
City of Taunton Wastewater Treatment Facility	0.01	0.01	0.01	0.01	*
Livestock facilities requiring NPDES permits	0	0	0	0	0
"Straight Pipe" Septic Systems	0	0	0	0	0
Construction and Industrial Stormwater 1%	0.4	0.07	0.02	0.003	*
Load Allocation					
Total Load Allocation	36	6.5	1.9	0.24	*

*WWTF design/discharge flow exceeded low flow, therefore allocation = Allocation = (flow contribution from a given source) x (TSS Permit Limit). See section 4.3 of the Final TMDL for details.

**Values may be rounded.

Total P

MPCA subdivided Total P loading capacity among the WLA, LA, and MOS components of the TMDL (Tables 21-25 at the end of this section). These calculations were based on the critical condition, the summer growing season, which is when the water quality in each lake is typically degraded and phosphorus loading inputs are the greatest. TMDL allocations assigned during the summer growing season will protect the YMRW lakes during the time of the year with the highest potential for degraded water quality. MPCA assumed that the loading capacities established by the TMDL will be protective of water quality during the remainder of the calendar year (October through May). Minnesota reflects these concerns with their targeted WQS approach for the months of June through September. In addition to their WQS reflecting this period, the BATHTUB model was calibrated to the summer growing period when loading is expected to be the greatest.

The YMRW Total P TMDL use the calibrated and validated HSPF model to determine inputs (flow and concentration inputs) for the BATHTUB models instead of direct measurements of the various lakes watersheds. When MPCA compared the modeled in lake concentrations with the two years of field data (2010 through 2011) they found that the BATHTUB models under predicted in-lake phosphorus concentrations. To calibrate the model, MPCA modified the internal load concentrations to reflect that which was observed in the measured data (Section 3.6.3 of the TMDL).

The YMRW TSS TMDLs are shown to have anywhere from 37 – 82% reduction in loading to achieve the various TMDLs (Table 4.4 of the TMDL). These reductions will be achieved by reducing the sources outlined in the Pollutant Sources section of this decision document. Reasonable assurance that the nonpoint source reductions will be achieved is outlined in Section 8 of this decision document.

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

The TMDL tables for all of the Total P TMDLs are found below and in Section 4.7.3, Impaired Lake Loading Capacities, of the TMDL.

Total P TMDL Tables

Table 22 – YMRW Total P TMDL 1

Total P (lbs per day)	
Cottonwood Lake 42-0014-00	
Pollutant Source	**Loading**
Average Daily Loading Capacity**	5.54
Margin of Safety	0.55
	Wasteload Allocation
Livestock facilities requiring NPDES permits	0
"Straight Pipe" Septic Systems	0
Construction and Industrial Stormwater 1%	0.05
	Load Allocation
Internal Load	0
All Other Load Allocations*	4.94

Table 23 – YMRW Total P TMDL 2

Total P (lbs per day)	
Lady Slipper Lake 42-0020-00	
Pollutant Source	**Loading**
Average Daily Loading Capacity**	1.43
Margin of Safety	0.14
	Wasteload Allocation
Livestock facilities requiring NPDES permits	0
"Straight Pipe" Septic Systems	0
Construction and Industrial Stormwater 1%	0.01
	Load Allocation
Total Load Allocation*	1.28

Table 24 – YMRW Total P TMDL 3

Total P (lbs per day)	
Perch Lake 41-0067-00	
Pollutant Source	**Loading**
Average Daily Loading Capacity**	1.2
Margin of Safety	0.12
	Wasteload Allocation
Livestock facilities requiring NPDES permits	0
"Straight Pipe" Septic Systems	0
Construction and Industrial Stormwater 1%	0.01
	Load Allocation
Total Load Allocation*	1.07

Table 25 – YMRW Total P TMDL 4

Total P (lbs per day)	
Curtis Lake 41-0058-00	
Pollutant Source	**Loading**
Average Daily Loading Capacity**	1.9
Margin of Safety	0.19
	Wasteload Allocation
Livestock facilities requiring NPDES permits	0
"Straight Pipe" Septic Systems	0
Construction and Industrial Stormwater 1%	0.02
	Load Allocation
Internal Load	0
All Other Load Allocations*	1.69

Table 26 – YMRW Total P TMDL 3

Total P (lbs per day)	
Steep Bank Lake 41-0082-00	
Pollutant Source	**Loading**
Average Daily Loading Capacity**	1.01
Margin of Safety	0.1
	Wasteload Allocation
Livestock facilities requiring NPDES permits	0
"Straight Pipe" Septic Systems	0
Construction and Industrial Stormwater 1%	0.01
	Load Allocation
Internal Load	0
All Other Load Allocations*	0.9

Table 27 – YMRW Total P TMDL 4

Total P (lbs per day)	
Lake Stay 41-0034-00	
Pollutant Source	**Loading**
Average Daily Loading Capacity**	2.89
Margin of Safety	0.29
	Wasteload Allocation
Livestock facilities requiring NPDES permits	0
"Straight Pipe" Septic Systems	0
Construction and Industrial Stormwater 1%	0.03
	Load Allocation
Total Load Allocation*	2.57

Table 28 – YMRW Total P TMDL 5

Total P (lbs per day)	
Wood Lake 87-0030-00	
Pollutant Source	**Loading**
Average Daily Loading Capacity**	4.52
Margin of Safety	0.45
	Wasteload Allocation
Livestock facilities requiring NPDES permits	0
"Straight Pipe" Septic Systems	0
Construction and Industrial Stormwater 1%	0.04
	Load Allocation
Total Load Allocation*	4.03

** Values may be rounded
* Load allocations include additional reductions from those modeled to achieve standards

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

4. Load Allocations (LAs)

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

Comment:

MPCA determined the LA calculations for each of the TMDLs based on the applicable WQS. MPCA recognized that LAs for each of the individual TMDLs addressed by the YMRW TMDLs can be attributed to various nonpoint sources. MPCAs' LA methodology in the YMRW was to address nonpoint sources by their pollutant of concern, and not by individual source. The LA for the TMDLs was calculated by summing the WLA and MOS, and assigning the remaining load to the LA.

E. coli

The calculated LA values for the *E. coli* TMDLs are applicable across all flow conditions in the YMRW. MPCA identified several nonpoint sources which contribute bacteria loads to the surface waters of the YMRW, including: non-regulated urban stormwater runoff; stormwater from agricultural and feedlot areas; failing septic systems; wildlife and pets. MPCA did not determine individual load allocation values for each of these potential nonpoint source considerations, but aggregated the nonpoint sources into a categorical LA value. Additionally, MPCA acknowledged that there are likely background *E. coli* levels attributed to naturalized populations, but did not separately calculate a value for this loading.

TSS

The calculated LA values for the TSS TMDLs are applicable across all flow conditions. MPCA identified several nonpoint sources which contribute sediment loads to the surface waters in the YMRW. Load allocations were recognized as originating from many diverse nonpoint sources including: stormwater contributions from overland erosion (typically agricultural sources); hydromodification (stream channelization, draining of wetlands, tile draining of fields); streambank erosion; natural sources from wetlands and forest; and atmospheric deposition. MPCA did not determine individual load allocation values for each of these potential nonpoint source considerations, but aggregated the nonpoint sources into one LA value ('Watershed Runoff').

Total P

MPCA identified several nonpoint sources which contribute Total P loads to the surface waters in the YMRW. Load allocations were recognized as originating from: failing septic systems; stormwater from agricultural and feedlot areas (manure, fertilizer, erosion of soils, transport via tile drains); streambank erosion; atmospheric deposition; and internal loading. For the Total P loading calculations MPCA calculated reductions in the model to achieve standards then further reduced the load by the MOS and the general construction permit loading; the remaining load is the LA. MPCA added internal loading of 0.39 – 2.91 mg/m^2 day for six of the seven lakes to account for differences between observed loading and model loading (Section 4.2.3 of the TMDL). Furthermore, Cotton Lake and Curtis Lake were modeled with a 100% reduction in internal load to achieve the TMDL. MPCA determined that runoff reductions were not sufficient enough to achieve the TMDL, so internal loading was reduced as necessary. The internal loading contribution was 11 and 32.5% of the total load for Cotton and Curtis lakes respectively. This calculation includes the increased internal load mentioned above and that which is part of the BATHTUB model. MPCA will achieve these goals though a flexible framework that could include: rough fish control; chemical phosphorus bonding; and establishment of native vegetation (Section 8.2 of the TMDL) as well as reducing external inputs from runoff in the watershed. For the remainder of the lake TMDLs, surface runoff reductions were adequate to achieve the TMDL.

EPA finds that the TMDL document submitted by 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:

MPCA identified thirty-two CAFOs in the YMRW (Section 4.3.2 of the TMDL). CAFOs and other feedlots are generally not allowed to discharge to waters of the State (Minnesota Rule 7020.2003). CAFOs were assigned a WLA of zero (WLA = 0) for the YMRW *E. coli* and Total P TMDLs. MPCA took a similar approach to straight pipe septic systems. MPCA specifically states that straight pipe septic systems are illegal and therefore receive a WLA of zero for all pollutants. In addition, there are nine permitted WWTFs that discharge into YMRW. None of these WWTFs are in the impaired lake watersheds.

MPCA also calculates a general WLA for construction and industrial stormwater for the TSS and Total P TMDLs. This WLA was represented as a categorical WLA for construction stormwater and a categorical WLA for industrial stormwater. Overall, the construction and industrial stormwater WLA make up a very small portion of the overall loading capacity but MPCA wanted to recognize their contributions. MPCA's process for determining the construction and industrial stormwater WLA is based off the summation of annual permit application areas for the previous 10 years. The summed value is 0.85% of the land area for both construction and industrial stormwater permits. To account for potential higher rates of construction MPCA choose a value of 1% for land area covered by construction and industrial stormwater permits. The allocation associated with this land area is calculated by applying the 1% threshold to the modeled LC.

According to MPCA there are no MS4 communities in the YMRW and none are likely to become subject to MS4 permit requirements in the near future. Furthermore, there are no industrial facilities that discharge within the YMRW.

E. coli

MPCA identified NPDES permitted facilities within the YMRW and assigned those facilities a portion of the WLA. According to MPCA the WWTF WLA "were determined by multiplying the permit limit of 126 org/100 ml by the maximum permitted discharge flow (based on a six inch per day discharge from the facility's secondary ponds)." CAFOs and straight pipe septic systems are included as individual line items for the YMRW *E. coli* TMDL calculations, with a WLA=0. The individual WLAs for *E. coli* can be found in the *E. coli* TMDL Tables 5-18 in Section 3 of this document.

TSS

MPCA identified NPDES permitted facilities within the YMRW and assigned those facilities a portion of the WLA. According to MPCA the WWTF WLA "were determined by multiplying the permit limit of 45 mg/L by the maximum permitted discharge flow (based on a six inch per day discharge from the facility's secondary ponds)." This value is multiplied by a conversion factor to determine the loading in tons of TSS. When the low flow concentration exceeds the TMDL by this methodology, the true WLA is calculated by multiplying the flow contribution from a given source by the TSS permit limit and the conversion factor. CAFOs (WLA = 0), straight pipe septic systems (WLA= 0), and the general construction/industrial stormwater allocation referenced above are included as individual line items for the YMRW TSS TMDL calculations. The individual WLAs for TSS are in Tables 19-21 of this Decision Document.

Total P

CAFOs and straight pipe septic systems are assigned a WLA of zero by MPCA. The general construction/industrial stormwater allocation referenced above also applies to the Total P lake TMDLs. See the Total P TMDL Tables 22-26.

EPA finds that the TMDL document submitted by 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)(l)(C), 40 C.F.R. §130.7(c)(1)). EPA's 1991 TMDL Guidance explains that the MOS may be implicit, i.e., incorporated into the TMDL through conservative assumptions in the analysis, or explicit, i.e., expressed in the TMDL as loadings set aside for the MOS. If the MOS is implicit, the conservative assumptions in the analysis that account for the MOS must be described. If the MOS is explicit, the loading set aside for the MOS must be identified.

Comments:
MPCA applies an explicit MOS to the TMDLs. See Section 4.5, Margin of Safety, in the TMDL.

E. coli
A 10% explicit margin of safety was established for the YMRW *E. coli* TMDLs. MPCA states that the HSPF model used to generate the hydrologic conditions is “a valid representation of hydrologic conditions in the watershed” and therefore a 10% MOS should account for any uncertainty in the model. EPA agrees with this MOS due to MPCAs determination that the system is appropriately represented with the HSPF model (Section 4.5.1 of the TMDL). MPCA noted that “the model was calibrated and validated using seventeen years (1996 through 2012) of flow data from USGS gaging station 05313500 and eleven years (1999 through 2009) of water chemistry data.”

Challenges associated with quantifying *E. coli* loads include the dynamics and complexity of bacteria in stream environments. Factors such as die-off and re-growth contribute to general uncertainty that makes quantifying stormwater bacteria loads particularly difficult. The MOS for the YMRW bacteria TMDLs 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 orgs/100 mL) and not to apply a rate of decay, which could result in a discharge limit greater than the WQS.

As stated in *EPA’s Protocol for Developing Pathogen TMDLs*[13], 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 conditions of the water. It would be difficult to assert that the rate of decay caused by any given combination of these environmental variables was sufficient to meet the WQS of 126 orgs/100 mL. Therefore, it is more conservative to apply the State's WQS as the bacteria target value, because this standard must be met at all times under all environmental conditions.

TSS
A 10% explicit margin of safety was established for the YMRW TSS TMDLs. MPCA states that the HSPF model used to generate the hydrologic conditions is “a valid representation of hydrologic conditions in the watershed” and therefore a 10% MOS should account for any uncertainty in the model. EPA agrees with this MOS due to MPCAs determination that the system is appropriately represented by the HSPF model (Section 4.5.2 of the TMDL). MPCA noted that “the model was calibrated and validated using seventeen years (1996 through 2012) of flow data from USGS gaging station 05313500 and eleven years (1999 through 2009) of water chemistry data.”

[13] Protocol for Developing Pathogen TMDLs EPA 841-R-00-002 – https://nepis.epa.gov/Exe/ZyPDF.cgi/20004QSZ.PDF?Dockey=20004QSZ.PDF

Total P

A 10% explicit margin of safety was established for the YMRW Total P TMDLs. The nutrient TMDLs use the same calibrated and validated HSPF model to load the BATHTUB models used in calculating the Total P TMDLs. Specific BATHTUB chemistry data was collected for two years (2010 through 2011) to calibrate the model. During calibration of the individual BATHTUB lake models the internal loading concentrations were increased to reflect observed concentration of phosphorus. EPA agrees with this MOS as MPCA explained that "the BATHTUB models are an appropriate representation of the natural system."

EPA finds that the TMDL document submitted by the MPCA satisfies 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)(l)(C), 40 C.F.R. §130.7(c)(l)).

<u>Comment:</u>

Seasonal variation is accounted for in each of the TMDLs by virtue of the datasets and modeling approaches capturing a wide range of conditions within a season, and across multiple years. In addition, MPCA has also developed their WQS to reflect the periods of concern associated with the designated uses addressed in this TMDL. Furthermore, the lake models specifically target the summer months, which are both the most biologically active, and when human contact is at its peak.

E. coli

Bacterial loads vary by season, typically reaching higher numbers in the dry summer months when low flows and bacterial growth rates contribute to their abundance, and reaching relatively lower values in colder months when bacterial growth rates attenuate and loading events, driven by stormwater runoff events aren't as frequent. Bacterial WQS need to be met between April 1st to October 31st, regardless of the flow condition. The development of the LDCs utilized simulated flow data which were validated and calibrated with local flow gage data. Modeled flow (HSPF) measurements represented a variety of flow conditions from the recreation season. LDCs developed from these modeled flow conditions represented a range of flow conditions within the YMRW and thereby accounted for seasonal variability over the recreation season.

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

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 YMRW, although there are differences from reach-to-reach. Sediment loading to surface waters in the YMRW varies depending on surface water flow, land cover, and climate/season. Typically, in the YMRW, sediment transport is attributed to wet weather events. TSS loading comes from overland flow, channel and stream bank erosion, as well as bluff erosion. 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.

Total P

Phosphorus levels in YMRW lake TMDLs vary over the growing season (June 1st to September 30th). The water quality targets were designed to meet the eutrophication WQS during the period of the year where the frequency and severity of algal growth is the greatest.

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

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

8. Reasonable Assurances

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

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

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

Comment:

The Clean Water Legacy Act (CWLA) is a statute passed in Minnesota in 2006 for the purposes of protecting, restoring, and preserving Minnesota water. The CWLA provides the process to be used in Minnesota to develop TMDL implementation plans, which detail the restoration activities needed to achieve the allocations in the TMDL. The TMDL implementation plans are required by the State to obtain funding from the Clean Water Fund (CWF). The Act discusses how MPCA and the involved public agencies and private entities will coordinate efforts regarding land use, land management, water management, etc. Cooperation is also expected between agencies and other entities regarding planning efforts, authorities, and responsibilities. This would also 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. The implementation plans are required to contain ranges of cost estimates for point and nonpoint source load reductions, as well as monitoring efforts to determine effectiveness. MPCA has developed guidance on what is required in the implementation plans (Implementation Plan Review Combined Checklist and Comment, MPCA), which includes cost estimates, general timelines for implementation, and interim milestones and measures. The Minnesota Board of Soil and Water Resources administers the CWF and has developed a detailed grants policy explaining what is required to be eligible to receive CWF money[14].

The CWLA also provides details on public and stakeholder participation, and how the funding will be used. In part to attain these goals, the CWLA requires MPCA to develop Watershed Restoration and Protection Strategies (WRAPS). The WRAPS are required to contain such elements as the identification of impaired waters, watershed modeling outputs, point and nonpoint sources, load reductions, etc.[15] 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.[16] Implementation plans developed for the TMDLs are included in the table, and are considered "priority areas" under the WRAPS process. 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 a WRAPS document.[17] The YMRW WRAPS was approved by MPCA on September 9th, 2016.

The Minnesota Board of Soil and Water Resources administers the CWF as well, and has developed a detailed grants policy explaining what is required to be eligible to receive CWF money (FY 2014 Clean Water Fund Competitive Grants Request for Proposal).[18]

The YMRW *E. coli*, Total P, and TSS TMDLs provide reasonable assurance that actions identified in the implementation section of the TMDL (i.e., Sections 6 and 8 of the TMDL document), will be applied to attain the loading capacities and allocations calculated for the impaired reaches within the YMRW. The recommendations made by MPCA will be successful at improving water quality if the appropriate local groups work to implement these recommendations. Those mitigation suggestions, which fall outside of regulatory authority, will require commitment from state agencies and local stakeholders to carry out the suggested actions. To address the lack of regulatory authority MPCA developed the above mentioned WRAPs to better identify nonregulated sources and community specific BMPs to reduce pollutant loading. In addition, the Yellow Medicine One Watershed-One Plan (YM 1W1P)[19] outlines more specific measures to be implemented to improve overall watershed quality. The sections below outline the reasonable assurance by pollutant sources.

Point Source

Reasonable assurance that WLAs 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

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[14] Minnesota Clean Water Fund – http://www.bwsr.state.mn.us/cleanwaterfund/index.html
[15] Chapter 114D.26; CWLA – https://www.revisor.leg.state.mn.us/statutes/?id=114D&view=chapter#stat.114D.26
[16] Chapter 114D.26, Subd. 1(8); CWLA – https://www.revisor.leg.state.mn.us/statutes/?id=114D&view=chapter#stat.114D.26
[17] WRAPS Template – https://www.pca.state.mn.us/water/tmdl-policy-and-guidance
[18] Clean Water Fund RFP – http://www.bwsr.state.mn.us/cleanwaterfund/index.html
[19] One Watershed, One Plan - http://www.bwsr.state.mn.us/planning/1W1P/index.html

assumptions and requirements of all WLAs in an approved TMDL. MPCA implements its storm water and NPDES permit programs, and is responsible for making the effluent limits consistent with the WLAs in this TMDL. TSS and Total P WLAs were assigned in this TMDL for general construction and industrial stormwater sources. The general permits for construction and industrial stormwater require that BMPs are properly selected, installed, and maintained.

Nonpoint Sources

MPCA has identified several local partners which have expressed interest in working to improve water quality within the YMRW. The following groups are expected to work closely with one another to ensure that pollutant reduction efforts via BMPs are being implemented within the YMRW: local municipal governments, private land owners (some of who have been involved in the planning process), local Soil and Water Conservation Districts (SWCDs); other nongovernmental organizations (NGOs); all under the guidance of the Board of Water and Soil Resources (BWSR). BWSR is a "State Agency overseen by 20 board members, including local government representatives and citizens", whose mission is to improve water and soil resources though cooperation with local organizations and private land owners.

The Yellow Medicine River Watershed District (YMRWD) has revised their 10-Year Watershed Plan to address the impairments noted in the YMRW TMDL. This plan documents lake and stream restoration actions that have occurred or are underway, as well as nutrient management projects. The 10-Year Watershed Plan also notes diagnostic studies regarding nutrients and sediments in the watershed, and discusses the local rules and regulations governing these efforts. Part of the plan's 10 year goal is the identification of priority subwatersheds to be addressed.

Additionally, Yellow Medicine County has a third-generation Priority Watershed Plan that documents actions and activities in Yellow Medicine County to address water quality. The plan lays out the projected implementation actions to be pursued by the County, and the funding needed. Lincoln County also has a Water Management Plan to address impairments in the county. The latest version of the plan includes specific BMPs to be implemented in portions of the Yellow Medicine River watershed, and commits to working with MPCA to address implementation actions as noted in TMDLs in the watershed.

MPCAs strategy for load reductions does not indicate the need for all practices to be implemented in all areas of concern. Instead MPCA recommends implementing a selection from the panoply of proposed BMPs to achieve the desired results. Specific recommendations of BMPs by subwatershed have been selected with local guidance giving an indication of the success of their implementation (Section 4.15 of the WRAPS). MPCA noted that it is not realistic to expect that all targets will be met immediately, which is why MPCA has a ten-year goal for BMP implementation. This time frame facilitates an adaptive management strategy where practices that are deemed successful can be encouraged and any less effective practices will be reevaluated.[20]

The planned actions outlined in the WRAPS report and implemented under the guidance of BWSR will be implemented and achieve the desired LA reductions by using local government and SWCDs as the lead for implementation. This will be achieved through various programs including: Minnesota Agricultural Water Quality Certification Program (AWQCP); Clean Water Act Section 319 grants; NRCS programs (EQUIP, etc.); and BWSR incentive programs. Specifically, Sections 4 and 5 of the YM 1W1P outline an implementation plan for pollutant reduction and a more targeted plan similar to that of the

[20] YMR WRAPS – https://www.pca.state.mn.us/sites/default/files/wq-ws4-13a.pdf

WRAPS report. These plans reiterate specific BMPs and go into more detail as to how the participation will be incentivized.

In addition to these practices MPCA will, as necessary, review statewide nonpoint source programs and enforce nonpoint source regulations designed to reduce phosphorus and sediment. These regulations include: the 50-foot buffer rule for shore impact zones; the 300-foot highly erodible land rule; buffers on public drainage; and the nuisance nonpoint source pollution rule.

EPA finds that the eighth 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 assess if load reductions provided for in the TMDL are occurring and leading to attainment of water quality standards.

Comment:

MPCA has a comprehensive water quality monitoring program, Minnesota's Water Quality Monitoring Strategy[21]. This program is comprised of three monitoring programs: Intensive Watershed Monitoring[22], Watershed Pollutant Load Monitoring Network[23], Citizen Stream and Lake Monitoring Program[24]. Descriptions of these monitoring programs can be found in Section 7 of the TMDL. According to MPCA these programs will be implemented by local units of government and will be tracked through BWSR's e-Link system. This monitoring approach focuses on the ten-year implementation period with targeted approaches outlined in the YMRW 1W1P[25]. In addition, MPCA has a statewide monitoring program that assesses the states waters on a ten-year rotating timeframe. This past monitoring created a robust dataset that was used for the model development of the YMRW TMDL, and will be used as a baseline to evaluate overall improvements in the watershed.

EPA finds that the ninth 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

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[21] Minnesota's Water Quality Monitoring Strategy – https://www.pca.state.mn.us/sites/default/files/p-gen1-10.pdf

[22] Intensive Watershed Monitoring – https://www.pca.state.mn.us/water/watershed-sampling-design-intensive-watershed-monitoring

[23] Watershed Pollutant Load Monitoring Network – https://www.pca.state.mn.us/water/watershed-pollutant-load-monitoring-network

[24] Citizen Stream and Lake Monitoring Program – https://www.pca.state.mn.us/water/citizen-water-monitoring

[25] YM 1W1P (Appendix K Sections 2 and 3) – http://www.area2.org/images/1W1P/Yellow%20Medicine%201W1P%2010_06_2016.pdf

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:

The findings from the YMRW TMDLs will be used to inform the selection of implementation activities as part of the YMR WRAPS[26] process. The purpose of the WRAPS report is to support local working groups and jointly develop scientifically-supported restoration and protection strategies to be used for subsequent implementation planning.

The TMDL outlined some implementation strategies in Section 8 of the TMDL document. MPCA outlined the importance of prioritizing areas within the YMRW, education and outreach efforts with local partners, and partnering with local stakeholders to improve water quality within the watershed. The YMR WRAPS document includes additional detail regarding specific recommendations from MPCA to aid in the reduction of *E. coli*, phosphorus, and TSS to surface waters of the YMRW. Additionally, MPCA referenced the Statewide Nutrient Reduction Strategy[27] for focused implementation efforts targeting phosphorus and nitrate nonpoint sources in YMRW. Specific strategies to achieve the *E. coli*, phosphorus, and TSS are outlined in Section 3 Restoration & Protections of YMR WRAPS[28] report and Sections 4 Targeted Implementation Plan and Section 5 Implementation Plan Programs of the YMR 1W1P[29].

EPA finds the tenth criterion has been adequately addressed. EPA reviews, but does not approve TMDL 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)(l)(ii)). In guidance, EPA has explained that final TMDLs submitted to EPA for review and approval should describe the State's/Tribe's public participation process, including a summary of significant comments and the State's/Tribe's responses to those comments. When EPA establishes a TMDL, EPA regulations require EPA to publish a notice seeking public comment (40 C.F.R. § 130.7(d)(2)).

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

Comment:

The TMDL was on public notice from May 15th, 2016 to June 15th, 2016. The public comment period

[26] YMR WRAPS – https://www.pca.state.mn.us/sites/default/files/wq-ws4-13a.pdf

[27] Minnesota's Nutrient Reduction Strategy - https://www.pca.state.mn.us/water/nutrient-reduction-strategy#nutrient-strategy

[28] YMR WRAPS Section 3 and Table 12A– https://www.pca.state.mn.us/sites/default/files/wq-ws4-13a.pdf

[29] YMR 1W1P Sections 4 & 5 Tables 4-1 to 4-4 and 4-6 to 4-7 – http://www.area2.org/images/1W1P/Yellow%20Medicine%201W1P%2010_06_2016.pdf

was announced in an MPCA news release and published in the Minnesota State Register on May 15th, 2016. Electronic copies of the draft TMDL were published on the MPCA website along with a notification of the public comment period. Many of these comments were directed at the WRAPS report and not directly about the TMDL.

MPCA received a total of five comment letters from the public, and addressed all relevant comments. Many of these comments were structural in nature; for example, one commenter noted that the figures were incorrectly numbered in the document. MPCA stated this this error occurred when the document as uploaded to the website and has been corrected. The other structural comments that were also addressed directly.

One commenter asked about atmospheric deposition. The commenter requested that the Barr Technical Memorandum be referenced as it related to atmospheric deposition. MPCA included the memo as a reference and cited it accordingly.

One commenter asked about the model and its assumptions around altered hydrology. MPCA addressed these comments by reiterating why they believe their model is an appropriate representation of the natural system. MPCA acknowledged the commenters suggestion to use NOAA data for Climate Regions 4 and 7, but indicated that using this data would represent a much larger area then that of the YMRW and therefore it was not included. MPCA further addressed questions about the altered hydrology assumptions by clarifying how increased precipitation and runoff is accounted for in the model.

One commenter inquired why the city of Minneota was not included as a point source as there have been known crosslinked storm and sanitary sewer systems. MPCA responded that the problem lines had been corrected in 2010.

There was a comment about natural background levels not being mentioned in the report. MPCA responded by directing the commenter to the section where this information is included. MPCA also address the comment about how these background levels relate to the goals of the TMDL, by referring to how the state nutrient reductions strategy takes these background levels into consideration for watershed planning. MPCA further clarifies that the outlined reductions are greater than these background levels.

There was also one comment that came from two different commenters regarding the use of professional judgement from the "WRAPS Workshop Team" to describe sources of pollution. MPCA reiterated their decision to use best professional judgment instead of the HSPF model, because this judgement was made in areas where the HSPF is deficient, specifically, in source identification for *E. coli*.

All comments were addressed in letters sent out on October 20th, 2016.

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:
On December 7th, 2016, EPA received a submittal letter dated November 9th, 2016 signed by Glenn Skuta, MPCA Watershed Division Director, addressed to Christopher Korleski, EPA Region 5, Water Division Director. The submittal letter identified the Yellow Medicine River Watershed portion of the Minnesota River-Yellow Medicine River Watershed as the subject of the TMDL. The locations of the specific waterbodies were provided in the supporting documentation. The TMDL submittal letter states that the pollutants of concern are bacteria, turbidity, and nutrient eutrophication. These concerns are addressed by the *E. coli*, TSS, and Total P TMDLs in this document. The letter explicitly states that the Yellow Medicine River TMDL was submitted for final approval by EPA under Section 303(d) of the Clean Water Act.

The EPA finds that the TMDL document submitted 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 Yellow Medicine River Watershed for *E. coli*, TSS, Total P meet all of the required elements of an approvable TMDL. This TMDL approval is for **twenty-six TMDLs** segments: seven (7) total phosphorus TMDLs; three (3) TSS TMDLs; and sixteen (16) *E.* coli TMDLs. These TMDLs address impairments for aquatic recreational and aquatic life use impairments as identified on Minnesota's 2010 303(d) list.

U.S. EPA's approval of the Yellow Medicine River Watershed TMDLs extend to the waterbodies which are identified in this Decision Document and the TMDL study with the exception of any portions of the waterbodies that are within Indian Country, as defined in 18 U.S.C. Section 1151. U.S. EPA is taking no action to approve or disapprove the State's TMDLs with respect to those portions of the waters at this time. U.S. EPA, or eligible Indian Tribes, as appropriate, will retain responsibilities under Section 303(d) for those waters.