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

NOV 2 0 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 Hawk Creek Watershed (HCW) of Minnesota, including support documentation and follow up information. The HCW is in southwestern Minnesota with portions in Chippewa, Kandiyohi, and Renville counties. The HCW TMDLs address impaired aquatic recreation due to excessive nutrients, bacteria, and impaired aquatic life use due to excessive sediment (turbidity).

EPA has determined that the HCW 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-two 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-iw7-43g

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TMDL: Hawk Creek Watershed TMDL, Chippewa, Kandiyohi, and Renville Counties, Minnesota
Date: 11/20/2017

Decision Document for the Approval of the Hawk Creek 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.

<u>Comments:</u>
The comments below discuss the waterbodies covered in this TMDL, pollutants of concern in these waterbodies, Minnesota Pollution Control Agency (MPCA) priority ranking process, and considerations for future growth in the watershed. This information is found in Sections 1, 3, and 5 of the final Hawk Creek Watershed (HCW) TMDL.

Identification of Waterbody

MPCA has submitted a TMDL for the HCW, located in southwestern Minnesota. Figures 1.1 and 1.2 of the TMDL show the location of the watershed within Minnesota and the Hydrologic Unit Code 12-digit (HUC-12) subwatersheds. The HCW TMDL document outlines the watershed in Sections 1 and 3 of the TMDL. The HCW watershed is approximately 626,000 acres and includes both the Western Corn Belt Plains (WCBP) and North Central Hardwood Forest (NCHF) ecoregions. Row crop agriculture dominates the HCW with all subwatersheds but one having three quarters of its area classified as cropland (Tributary to Hawk Creek at 65.5%). MPCA has indicated that there is little to no population growth expected in the HCW as it is a predominately agricultural watershed.

The HCW TMDL addresses twenty-two impairments, with thirteen TMDLs for *Escherichia coli* (*E. coli*), five total suspended solids (TSS) TMDLs and four total phosphorus (Total P) TMDLs. The *E. coli* TMDLs address aquatic recreation impairments along with three of the four Total P TMDLs. The other Total P TMDL and the TSS TMDLs address aquatic life impairments. Table 1 of the TMDL outlines the assessment units addressed in this TMDL including: assessment unit ID number; designated use; pollutants or stressors; and year listed as impaired. The impaired assessment units are shown in Table 1.1 of TMDL. See Table 1 below for a summary of impairments, stressors, and assessment units.

Table 1: Hawk Creek Watershed Impairments

Impairments Identified in the Hawk Creek Watershed TMDL

HUC 12 Watershed	Reach Description	Assessment Unit ID or MN DNR Lake #	Year Listed	Affected Designated Use	Stressor	TMDL
Beaver Creek	East Fork Beaver Creek to Minnesota River	07020004-528	2006	Aquatic Recreation	Fecal coliform†	*E. coli*
			2006	Aquatic Life	Turbidity†	TSS
Chetomba Creek	Chetomba Creek to Spring Creek	07020004-589	2010	Aquatic Recreation	*Escherichia coli*	*E. coli*
			2006	Aquatic Life	Turbidity†	TSS
	Lake Olson	34-0266-00	2014	Aquatic Life	Eutrophication	Total P
County Ditch 11	Unnamed ditch to Hawk Creek	07020004-689	2014	Aquatic Recreation	*Escherichia coli*	*E. coli*
East Fork Beaver Creek	T115 R35W S35, North Line to West Fork Beaver Creek	07020004-586	2014	Aquatic Recreation	*Escherichia coli*	*E. coli*

Lower Hawk Creek	Spring Creek to Minnesota River	07020004-587	2010	Aquatic Recreation	*Escherichia coli*	*E. coli*
			2004	Aquatic Life	Turbidity†	TSS
	Unnamed Creek to Unnamed Creek	07020004-568	2006	Aquatic Recreation	Fecal coliform†	*E. coli*
			2006	Aquatic Life	Turbidity†	TSS
Sacred Heart Creek	Headwaters to Minnesota River	07020004-526	2010	Aquatic Recreation	*Escherichia coli*	*E. coli*
Sacred Heart Creek - MN River	Headwaters to Minnesota River	07020004-525	2010	Aquatic Recreation	*Escherichia coli*	*E. coli*
	CD 120 to Minnesota River	07020004-615	2010	Aquatic Recreation	*Escherichia coli*	*E. coli*
	T113 R35W S4, north line to Minnesota River	07020004-617	2014	Aquatic Recreation	*Escherichia coli*	*E. coli*
Stony Run Creek - MN River	Headwaters to Minnesota River	07020004-534	2014	Aquatic Recreation	*Escherichia coli*	*E. coli*
Tributary to Hawk Creek	St. John's Lake	34-0283-00	2014	Aquatic Recreation	Eutrophication	Total P
	West Solomon Lake	34-0245-00	2014	Aquatic Recreation	Eutrophication	Total P
Upper Hawk Creek	Swan Lake	34-0186-00	2014	Aquatic Recreation	Eutrophication	Total P
West Fork Beaver Creek	Headwaters to East Fork Beaver Creek	07020004-530	2006	Aquatic Recreation	Fecal coliform†	*E. coli*
			2006	Aquatic Life	Turbidity†	TSS
Wood Lake Creek - MN River	Unnamed Creek to Minnesota River	07020004-648	2014	Aquatic Recreation	*Escherichia coli*	*E. coli*

† These are the stressors for which the assessment units were listed. They have been replaced by TSS and *E. coli* respectively.

Pollutants of Concern

MPCA developed twenty-two TMDLs to address twenty-two stressors in the HCW: thirteen *E. coli* TMDLs for aquatic recreation in rivers; five TSS TMDLs to address aquatic life impairments; three Total P TMDLs to address aquatic recreation; and one Total P TMDL to address an aquatic life use impairment. MPCA noted that the TSS TMDLs will also address preexisting turbidity impairments based on the previous turbidity standard (Section 2 of the TMDL).

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 and the associated bacteria, viruses, and protozoa that are pathogenic to humans when ingested. Fecal coliform was previously used as an indicator, but MPCA made the switch to E. coli as it was seen as a more accurate measure. Based on *E. coli* sampling data collected June through August in 2001 and 2011, the *E. coli* geometric monthly standard was exceeded in all *E. coli* impaired assessment units with the exception of Sacred Heart Creek to the MN River (07020004-617). Additionally, all but three of these assessment units had an exceedance of the onetime maximum for *E. coli*.

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. Suspended solids data were collected from April through September from 2001 through 2008. All stream segments with TSS impairments exceeded the criterion that no more than 10% of samples can be greater than the established value.

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 excess levels of phosphorus. Measurements were collected for Total P, chlorophyll α, and secchi disk transparency from June through September for 2010 through 2011. All impaired lakes in the HCW TMDL show exceedance of two or more criterion parameters, with St. John's Lake having an acceptable Secchi Disk transparency depth and the average chlorophyll α values were within acceptable amounts for Swan Lake.

Pollutant Sources

The pollutant loads in the HCW are primarily attributed to nonpoint sources with additional loading originating from municipal, industrial, and construction sources. MPCA has also identified natural sources of loading in the TMDLs. The pollutants and their corresponding sources are broken out below. Lists of the permitted facilities in the HCW can be found in Section 5 of this 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 HCW TMDL). These sources include naturalized populations, agricultural related contributions, and permitted facilities. Specific information on these and other sources can be found in the sections below.

Point sources

Waste Water Treatment Plants (WWTPs) – NPDES permitted facilities 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 twelve WWTPs in the HCW which contribute bacteria from treated wastewater releases (Table 7 of this Decision Document) to segments impaired by bacteria. None of these WWTPs are within the HC lake watersheds. 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 waterbodies during or shortly after storm events. These subsurface drainage systems reduce ultraviolet exposure to the stormwater, which can lead to elevated bacterial concentrations. MPCA identified the City of Willmar as the only MS4 community that discharges to impaired waters within the HCW.

Combined Sewer Overflows (CSOs) and Sanitary Sewer Overflows (SSOs) – MPCA did not identify any CSOs or SSOs in the HCW.

Permitted Animal Feedlot Operations (AFOs) – MPCA identified fifty permitted AFOs in the HCW (Table 4.13 of the TMDL, Table 6 of this Decision Document). These permitted AFOs 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 are not permitted to discharge effluent and therefore were assigned a WLA of zero (WLA = 0).

Straight Pipe Septic Systems – Straight pipe septic systems are illicit direct discharges of wastes to waters of the US. These systems should instead be part of an onsite or municipal treatment system. Systems which discharge partially treated sewage to the ground surface, road ditches, tile lines, streams, rivers, and lakes are considered an imminent threat to public health and safety (ITPHS). ITPHS systems also include illicit discharges from unsewered communities.

Beet Sugar Production Facility – There is one beet sugar production facility that discharges into a water impaired for *E. coli* in the HCW. This facility has been assigned a WLA.

Nonpoint sources

Agriculture – Nonpermitted AFOs in close proximity to surface waters can be a source of bacteria to waterbodies in the HCW. 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 permit program and therefor are not subject to the strict zero discharge regulations. Runoff from agricultural lands (row crop and livestock) may contain significant amounts of bacteria which could lead to impairments in the HCW. Feedlots generate manure which may be spread onto fields as fertilizer. Manure runoff from fields can be exacerbated by tile drainage lines that channelize the stormwater flows and reduce bacteria die-off potential. Additionally, unrestricted livestock access to streams in pasture areas can 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. There are approximately 332 nonpermitted feedlots in the HCW.

Subsurface Sewage Treatment Systems (SSTS) or Unsewered Communities – Failing septic systems are a potential source of bacteria within the HCW. 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.

Wildlife and Pets – Wildlife is a known source of bacteria in waterbodies as many animals spend time in or around waterbodies. 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.

TSS

MPCA specifically identifies several sources of suspended sediment in the HCW (see Section 3.6.2 of the TMDL). These sources include overland erosion of cultivated lands and hydrologic changes that increase sediment transport. In addition, permitted sources such as WWTPs, MS4s, stormwater from construction, also are attributed to the TSS loads in the HCW.

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 eleven WWTPs in the HCW which contribute sediment (Table 7 of this Decision Document) to segments impaired for TSS. MPCA assigned each of these facilities a portion of the suspended sediment WLA. MPCA has determined that these discharges are not a major source of TSS and the existing effluent limits are below the water quality standards.

Municipal Separate Storm Sewer System (MS4) communities – Stormwater from MS4s can transport sediment and street particulates to surface waterbodies during or shortly after storm events. MPCA identified the City of Willmar as the only MS4 community that discharges to impaired waters within the HCW.

Straight Pipe Septic Systems – Straight pipe septic systems are illicit direct discharges of wastes to waters of the US. These systems should instead be part of an onsite or municipal treatment system. Systems which discharge partially treated sewage to the ground surface, road ditches, tile lines, streams, rivers, and lakes are considered an imminent threat to public health and safety (ITPHS). ITPHS systems also include illicit discharges from unsewered communities.

Combined Sewer Overflows (CSOs) and Sanitary Sewer Overflows (SSOs) – MPCA did not identify any CSOs or SSOs in the HCW.

Animal Feedlot Operations (AFOs) – MPCA identified fifty permitted AFOs in the HCW (Table 4.13 of the TMDL, Table 6 of this Decision Document). These permitted AFOs 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 are not permitted to discharge effluent and therefore were assigned a WLA of zero (WLA = 0).

Stormwater from Construction – Construction sites may contribute sediment runoff during stormwater events. These sites must comply with the requirements of the MPCA's NPDES Stormwater Program. The NPDES program requires construction and industrial sites to create a Stormwater Pollution Prevention Plan (SWPPP) that summarizes how stormwater will be minimized from the site.

Beet Sugar Production Facility – There is one beet sugar production facility that discharges into a water impaired for TSS in the HCW. This facility has been assigned a WLA for the two assessment units impacted.

Ethanol Production Facility – There is one ethanol plan that discharges into an impaired water in the HCW. This facticity has been assigned a WLA for TSS.

Nonpoint sources
Overland Erosion – Runoff from agricultural lands may contain significant amounts of sediment which may lead to impairments in the HCW. 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 – Extensive tile draining and ditching in agricultural lands has led to major hydrologic changes in the HCW. Changes in flow patterns may also encourage down-cutting of the streambed and streambanks. Tile draining lands 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 – Although minor in the HCW due to past land cover changes, sediment may be added to surface waters by stormwater flows through wetland or forested areas. 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 HCW.

Total P
MPCA identified areas potentially contributing phosphorus to the nutrient impairments of four impaired lakes within the HCW, including: failing septic systems and straight pipe septic systems; erosion; fertilizer runoff from croplands (including land applied manure); permitted construction; animal feeding operations; internal loading; and atmospheric loading. See below for a more detailed explanation.

Point sources
Stormwater from Construction – Erosion from construction sites may contribute sediment to a waterway if the stormwater is untreated. This sediment may have phosphorus sorbed to the sediment particles and in turn be a source of phosphorus in the HCW.

Permitted Animal Feedlot Operations (AFOs) – MPCA identified fifty permitted AFOs in the HCW (Table 4.13 of the TMDL, Table 6 of this Decision Document). Permitted AFO 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 are not permitted to discharge effluent and therefore were assigned a WLA of zero (WLA = 0).

Straight Pipe Septic Systems – Straight pipe septic systems are illicit direct discharges of wastes to waters of the US. These systems should instead be part of an onsite or municipal treatment system. Systems which discharge partially treated sewage to the ground surface, road ditches, tile lines, streams, rivers, and lakes are considered an imminent threat to public health and safety (ITPHS). ITPHS systems also include illicit discharges from unsewered communities.

WWTPs – None of the WWTPs in the HCW are in the contributing watersheds of the lake Total P TMDLs.

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. Counties estimated SSTS non-compliance rate ranges from 35% to 75%.

Manure and Fertilizer Application – Runoff from agricultural lands may contain significant amounts of nutrients, organic material, and organic-rich sediment which may contribute to impairments in the HCW. Manure spread onto fields is often a source of phosphorus, and can be exacerbated by tile drainage lines that channelize stormwater. Tile drained 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 a 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. Phosphorus is transported in particulate form bound to the 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. Down-cutting can be exacerbated by livestock with direct access to stream environments, which may also lead to direct addition of nutrients or to the resuspension of particles that had settled on the stream bottom.

Internal Loading – When phosphorus inputs are greater than then biological need and ability for a lake to export it can build up in lake sediment. This phosphorus then can be directly leached from sediments, released though physical disturbance from benthic fish (rough fish, ex. carp), released by mixing of the water column, and from decaying curly-leaf pondweeds. This internal loading of phosphorus is seen as a major contributor to Total P related impairments in the HCW. In fact, the MPCA increased the internal loading portion of the lake models to better represent the observed in-lake conditions.

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 HCW. Phosphorus can be bound to these particles which may add to the phosphorus inputs to surface water environments. This source was included in the lake models.

Upstream Contributions – Upstream waterbodies may contribute nutrient, organic material and organic-rich sediment loads via water flow between hydrologically connected upstream and downstream lake systems. Sources of this loading may include nonregulated stormwater runoff, nutrient contributions from aquatic and terrestrial life, and excess internal loading in upstream lakes. These sources export nutrients to the downstream lake.

Priority Ranking
The waterbodies addressed by the HCW TMDLs were given a priority ranking for TMDL development due to: the impairment impacts on public health and aquatic life, the public value of the impaired water

resource, the likelihood of completing the TMDL in an expedient manner, the inclusion of a strong base of existing data, the restorability of the waterbody, the technical capability and the willingness of local partners to assist with the TMDL, and the appropriate sequencing of TMDLs within a watershed or basin. Water quality degradation has led to efforts to improve the overall water quality within the HCW, and to the development of TMDLs for these waterbodies. Additionally, MPCA explained that its TMDL development priorities were prioritized to align with its Statewide watershed monitoring approach and its 10-year Watershed Restoration and Protection Strategies (WRAPS) schedule. The most recent listings in this TMDL are those found in the 2014 draft 303(d) list of impaired waterbodies (Section 1 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 HCW TMDL addresses twenty-two stressors with twenty-two TMDLs. Sixteen of the TMDLs are address aquatic recreation impairments and six are address aquatic life use impairments (Table 1.1 of the TMDL) Table 1 of this Decision Document lists the impairments and their associated pollutants. The corresponding water quality standards (WQS) can be found in Section 2 of the TMDL and are detailed in the section below.

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 HCW 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 lakes, streams, and rivers are listed as impaired for aquatic recreation and/or aquatic life use. All of the impaired rivers and lakes except for two fall under the Class 2B waters designated use. The 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 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 waters is also protected as a source of drinking water. The applicable standards are given below. Abbreviations, acronyms, and symbols are explained in subpart 1."[2]

Two of the of the stream assessment units (07020004-615 and 07020004-617) are listed as impaired for aquatic recreation fall under the Class 2C waters designated use. The applicable narrative criteria states:

"The quality of Class 2C surface waters shall be such as to permit the propagation and maintenance of a healthy community of indigenous fish and associated aquatic life, and their habitats. These waters shall be suitable for boating and other forms of aquatic recreation for which the waters may be usable."[3]

Numeric Criterion

Table 2: Minnesota Water Quality Standards

<table>
<tr><th colspan="5">Applicable Water Quality Standards</th></tr>
<tr><th>Parameter</th><th>Water Quality Standard</th><th>Units</th><th>Criteria</th><th>Applicable Time Period</th></tr>
<tr><td rowspan="2">Escherichia coli - Class 2(B,C) waters</td><td>Not to exceed 126</td><td>org/100 mL</td><td>Monthly geometric mean of a least 5 samples within one calendar year</td><td rowspan="2">April 1st – October 31st</td></tr>
<tr><td>Not to exceed 1,260</td><td>org/100 mL</td><td>Monthly upper 10th percentile</td></tr>
<tr><td>TSS Class 2B Waters</td><td>Not to Exceed 65</td><td>TSS mg/L</td><td>No more than 10% of total samples</td><td>April 1st – September 30ith</td></tr>
<tr><td rowspan="2">Total P - Northern Lakes and Forests Shallow Lakes 2B Waters</td><td>Less than 90</td><td>P µg/L</td><td>Concentration should not exceed</td><td rowspan="2">June 1st – September 30ith</td></tr>
<tr><td>Less than 30</td><td>Chlorophyll-α µg/L</td><td>Concentration should not exceed</td></tr>
</table>

[1] Use classification 2 waters (Minn. R. 7050.0140, Subp 3)
[2] Narrative criteria class 2B waters (Minn. R. 7050.0222, subp. 3.)
[3] Narrative criteria class 2C waters (Minn. R. 7050.0222, subp. 5.)

	Greater than 0.7	meters	Secci depth measurement should exceed	

E. coli
The applicable numeric criteria for the waters of the HCW are located above (Table 2 of this Decision Document). The TMDLs addressed in this Decision Document focus 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 HCW, 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
Previously when the HCW was assessed the applicable water quality standard was the statewide criterion of 25 nephelometric turbidity units (NTUs). This standard was applied and led to the listing of multiple assessment units. 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 regional TSS criteria were developed to more accurately address the turbidity impairments.[4] The TSS criterion for the WCBP and NCHF ecoregions 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 HCW (Table 2 of this Decision Document).

Total P
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 HCW lake TMDLs are found in Table 2 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*.[5]

The evaluations of the lakes mentioned above show clear relationships 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 HCW 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 experiencing 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

[4] 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

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

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:

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

where: LC is the loading capacity; WLA is the wasteload allocation; LA is the load allocation; MOS is the margin of safety; and (pursuant to MPCA rules) RC is any reserve capacity set aside for future growth. In the HCW TMDLs MPCA did not set aside any RC as they do not anticipate future growth in the HCW. The TMDLs for the HCW 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) for the stream segment TMDLs (to determine TSS and *E. coli* loads); (2) a conventional daily load mass balance for the lake (Total P) TMDLs. These lake TMDLs apply the BATHTUB model approach using the HSPF spatially relevant hydrologic response units (HRU) model outputs as their 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 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.[6,7] The output of the HSPF process is a model of multiple HRUs, or subwatersheds of the overall HCW. According to MPCA, the HCW model was calibrated and validated with data from five different gage sites, with data spanning a seventeen-year

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

period (1996 through 2012).

BATHTUB

MPCA used the U.S. Army Corps of Engineers (USACE) BATHTUB model to calculate the loading capacities for the lake 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".[8] These TMDLs use the BATHTUB model to link observed phosphorus water quality conditions and modeled phosphorus loading to in-lake water quality values. BATHTUB can be a steady-state annual or seasonal model that predicts a lake's water quality. BATHTUB utilizes annual or seasonal time-scales which are appropriate because watershed 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. Additionally, BATHTUB provides flexibility to tailor model inputs to specific lake morphometry, watershed characteristics and watershed inputs. The BATHTUB model also allows MPCA to assess impacts of changes in nutrient loading from the various sources.

The model equations were originally developed 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.[9]

For the HCW Total P TMDLs the BATHTUB process was used to calculate the loading capacity for each lake. The loading capacity is the maximum phosphorus load which each of these waterbodies 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 contains the months that the general public typically use lakes in the HCW 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 for atmospheric deposition, the watershed (tributary and nonpoint), and internal loading were determined using inputs from the HSPF model and observed in-lake data. The watershed input and internal loading portions of the BATHTUB model are then adjusted until the in-lake WQS target is achieved. The watershed loading portion of this model was then further reduced by the MOS to account for uncertainty in the model. This finalized BATHTUB model contains the WLA, LA, and MOS portions of the TMDL. The model is developed on an

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

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

annual basis so loading capacities were divided by 365 to calculate the daily loading capacities.

EPA concurs with use of HSPF and BATHTUB 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 HCW 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 HCW and measured pollutant concentrations were converted to individual sampling loads by multiplying the sample concentration by the instantaneous flow measurement observed/estimated at the time of sample collection. The individual sampling loads were plotted on the same figure with as the generated 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.[10]

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 instead, *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".[11] To establish the loading capacities for the HCW *E. coli* TMDLs, MPCA used Minnesota's WQS for *E. coli* (in orgs/mL). A loading capacity is, "the greatest amount of loading that a water can receive without violating water quality standards."[12] 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."[13] 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 its WQS to reflect when the highest potential for contact occurs (spring though summer). By targeting this critical exposure period MPCA can achieve the greatest overall protection. Review of the historical data indicates that all flow regimes show exceedances of the criteria. The loading is likely attributed to the high amount of cropland acres where manure is being land applied and numerous animal feeding operations.

EPA supports the data analysis and modeling approach used by MPCA in its calculation of wasteload allocations, load allocations, and the margin of safety for the HCW *E. coli* TMDLs. Additionally, EPA concurs with the loading capacities calculated by MPCA in the thirteen *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 of the TMDL.

E. coli TMDL Tables

Table 3: Bacteria (*E. coli*) TMDLs for the Hawk Creek Watershed

[10] 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

[11] 40 CFR §130.2

[12] 40 CFR §130.2

[13] 69 FR 67218-67243 (November 16, 2004) – https://www.gpo.gov/fdsys/pkg/FR-2004-11-16/html/04-25303.htm

Allocation	Source	Very High	High	Mid	Low	Very Low
		E. coli (billions of organisms/day)				
TMDL for Beaver Creek East Fork Beaver Creek to Minnesota River (07020004-528)						
Wasteload Allocation	Bird Island WWTP	1.1136	1.1136	1.1136	1.1136	*
	Danube WWTP	0.645	0.645	0.645	0.645	*
	Olivia WWTP	0.98	0.98	0.98	0.98	*
	Livestock Facilities with NPDES Permits	0	0	0	0	0
	"Straight Pipe" Septic Systems	0	0	0	0	0
	WLA Totals	**2.7**	**2.7**	**2.7**	**2.7**	*****
Load Allocation	Watershed load	851.7	210.8	68.7	12.7	#
	LA Totals	**851.6614**	**210.7614**	**68.6614**	**12.6614**	**#**
	Margin of Safety (10%)	**95**	**23.7**	**8**	**1.7**	**0.003**
	Loading Capacity (TMDL)	**949.4**	**237.2**	**79.4**	**17.1**	**0.03**
TMDL for East Fork Beaver Creek (07020004-586)						
Wasteload Allocation	Bird Island WWTP	5.42	5.42	5.42	*	*
	Olivia WWTP	4.67	4.67	4.67	*	*
	Livestock Facilities with NPDES Permits	0	0	0	0	0
	"Straight Pipe" Septic Systems	0	0	0	0	0
	WLA Totals	**10.1**	**10.1**	**10.1**	*****	*****
Load Allocation	Watershed load	223.81	76.11	21.71	#	#
	LA Totals	**223.81**	**76.11**	**21.71**	**#**	**#**
	Margin of Safety (10%)	**26**	**9.6**	**3.5**	**1**	**0.06**
	Loading Capacity (TMDL)	**259.9**	**95.8**	**35.3**	**10.4**	**6**
TMDL for Chetomba Creek (07020004-589)						
Wasteload Allocation	Bloomkest/Svea WWTP	2.14	2.14	2.14	2.14	*
	Prinsburg WWTP	0.26	0.26	0.26	0.26	*
	Roseland WWTP	1.79	1.79	1.79	1.79	*
	Livestock Facilities with NPDES Permits	0	0	0	0	0
	"Straight Pipe" Septic Systems	0	0	0	0	0
	WLA Totals	**4.2**	**4.2**	**4.2**	**4.2**	*****
Load Allocation	Watershed load	861.7	166.9	46.2	6.4	#
	LA Totals	**861.71**	**166.91**	**46.21**	**6.41**	**#**
	Margin of Safety (10%)	**96.2**	**19**	**5.6**	**1.2**	**0.003**
	Loading Capacity (TMDL)	**962.1**	**190.1**	**56**	**11.8**	**0.03**

TMDL for Lower Hawk Creek (07020004-587)						
Wasteload Allocation	Bloomkest/Svea WWTP	2.14	2.14	2.14	2.14	*
	Prinsburg WWTP	0.26	0.26	0.26	0.26	*
	Roseland WWTP	1.79	1.79	1.79	1.79	*
	City of Wilmar MS4	31.9	9.1	2.4372	0.6552	*
	Livestock Facilities with NPDES Permits	0	0	0	0	0
	"Straight Pipe" Septic Systems	0	0	0	0	0
	WLA Totals	**36.09**	**13.29**	**6.6272**	**4.8452**	*****
Load Allocation	Watershed load	2604.61	673.11	189.97	36.55	#
	LA Totals	**2604.61**	**673.11**	**189.97**	**36.55**	**#**
Margin of Safety (10%)		**293.4**	**76.3**	**21.8**	**4.6**	**0.003**
Loading Capacity (TMDL)		**2934.1**	**762.7**	**218.4**	**46.0**	**0.03**
TMDL for County Ditch 11 (07020004-689)						
Wasteload Allocation	Maynard WWTP	0.73	0.73	0.73	0.73	*
	Livestock Facilities with NPDES Permits	0	0	0	0	0
	"Straight Pipe" Septic Systems	0	0	0	0	0
	WLA Totals	**0.73**	**0.73**	**0.73**	**0.73**	*****
Load Allocation	Watershed load	97.37	20.07	3.27	0.17	#
	LA Totals	**97.37**	**20.07**	**3.27**	**0.17**	**#**
Margin of Safety (10%)		**10.9**	**2.3**	**0.5**	**0.1**	**0.003**
Loading Capacity (TMDL)		**109**	**23.1**	**4.5**	**1**	**0.03**
TMDL for Lower Hawk Creek (07020004-568)						
Wasteload Allocation	Clara City WWTP	2.19	2.90	2.19	*	*
	Maynard WWTP	0.73	0.73	0.73	*	*
	Pennock WWTP	3.11	3.11	3.11	*	*
	Raymond WWTP	6.76	6.76	6.76	*	*
	Willmar WWTP	35.82	35.82	35.82	*	*
	City of Wilmar MS4	31.9	9.1	2.4372	0.6552	0.117
	Livestock Facilities with NPDES Permits	0	0	0	0	0
	"Straight Pipe" Septic Systems	0	0	0	0	0
	WLA Totals	**80.5**	**58.4**	**51.0**	*****	*****
Load Allocation	Watershed load	1518.09	397.39	84.09	#	#
	LA Totals	**1518.09**	**397.39**	**84.09**	**#**	**#**

	Margin of Safety (10%)	**177.6**	**50.6**	**15.1**	**4**	**0.7**
	Loading Capacity (TMDL)	**1776.2**	**506.41**	**150.2372**	**40.4**	**7.2**
TMDL for Sacred Heart Creek (07020004-526)						
Wasteload Allocation	Renville WWTP	4.07	4.07	4.07	*	*
	Southern Minnesota Beet Sugar - SD009	10.87	10.87	*	*	*
	Livestock Facilities with NPDES Permits	0	0	0	0	0
	"Straight Pipe" Septic Systems	0	0	0	0	0
	WLA Totals	**14.9**	**14.9**	**4.1**	**0.0**	**0.0**
Load Allocation	Watershed load	55.6	2.25	#	#	#
	LA Totals	**55.55**	**2.25**	**#**	**#**	**#**
	Margin of Safety (10%)	**7.8**	**1.9**	**0.6**	**0.1**	**0.003**
	Loading Capacity (TMDL)	**78.29**	**19.09**	**5.6**	**1**	**0.03**
TMDL for Sacred Heart Creek - MN River (07020004-525)						
Wasteload Allocation	Livestock Facilities with NPDES Permits	0	0	0	0	0
	"Straight Pipe" Septic Systems	0	0	0	0	0
	WLA Totals	**0**	**0**	**0**	**0**	**0**
Load Allocation	Watershed load	74.5	18.1	5.2	1	0.027
	LA Totals	**74.5**	**18.1**	**5.2**	**1**	**0.027**
	Margin of Safety (10%)	**8.3**	**2**	**0.6**	**0.1**	**0.003**
	Loading Capacity (TMDL)	**82.8**	**20.1**	**5.8**	**1.1**	**0.03**
TMDL for Stony Run Creek - MN River (07020004-534)						
Wasteload Allocation	Livestock Facilities with NPDES Permits	0	0	0	0	0
	"Straight Pipe" Septic Systems	0	0	0	0	0
	WLA Totals	**0**	**0**	**0**	**0**	**0**
Load Allocation	Watershed load	138.2	28.6	5.8	1.3	0.027
	LA Totals	**138.2**	**28.6**	**5.8**	**1.3**	**0.027**
	Margin of Safety (10%)	**15.4**	**3.2**	**0.7**	**0.1**	**0.003**
	Loading Capacity (TMDL)	**153.6**	**31.8**	**6.5**	**1.4**	**0.03**
TMDL for West Fork Beaver Creek (07020004-530)						
Wasteload Allocation	Livestock Facilities with NPDES Permits	0	0	0	0	0
	"Straight Pipe" Septic Systems	0	0	0	0	0
	Danube WWTP	3.08	3.08	3.08	3.08	*

	WLA Totals	**3.08**	**3.08**	**3.08**	**3.08**	*****
Load Allocation	Watershed load	449.26	103.84	31.84	4.93	#
	LA Totals	**449.26**	**103.84**	**31.84**	**4.93**	**#**
Margin of Safety (10%)		**50.26**	**11.88**	**3.88**	**0.89**	**0.003**
Loading Capacity (TMDL)		**502.6**	**118.8**	**38.8**	**8.9**	**0.03**
TMDL for Wood Lake Creek - MN River (07020004-648)						
Wasteload Allocation	Livestock Facilities with NPDES Permits	0	0	0	0	0
	"Straight Pipe" Septic Systems	0	0	0	0	0
	WLA Totals	**0**	**0**	**0**	**0**	**0**
Load Allocation	Watershed load	70.6	14.5	3.0	0.5	0.0
	LA Totals	**70.6**	**14.5**	**3**	**0.54**	**0.027**
Margin of Safety (10%)		**7.9**	**1.6**	**0.3**	**0.06**	**0.003**
Loading Capacity (TMDL)		**78.5**	**16**	**3.3**	**0.6**	**0.03**
TMDL for Sacred Heart Creek - MN River (07020004-617)						
Wasteload Allocation	Livestock Facilities with NPDES Permits	0	0	0	0	0
	"Straight Pipe" Septic Systems	0	0	0	0	0
	WLA Totals	**0**	**0**	**0**	**0**	**0**
Load Allocation	Watershed load	28453.5	11353.5	4710.6	116.2	513.9
	LA Totals	**28453.5**	**11353.5**	**4710.6**	**116.2**	**513.9**
Margin of Safety (10%)		**3161.5**	**1261.5**	**523.4**	**201.8**	**57.1**
Loading Capacity (TMDL)		**31615**	**12615**	**5234**	**318**	**571**
TMDL for Sacred Heart Creek - MN River (07020004-615)						
Wasteload Allocation	Livestock Facilities with NPDES Permits	0	0	0	0	0
	"Straight Pipe" Septic Systems	0	0	0	0	0
	WLA Totals	**0**	**0**	**0**	**0**	**0**
Load Allocation	Watershed load	8188.2	3275.1	1305.3	511.2	126.9
	LA Totals	8188.2	3275.1	1305.3	511.2	126.9
Margin of Safety (10%)		909.8	363.9	145.7	56.8	14.1
Loading Capacity (TMDL)		**9098**	**3639**	**1451**	**568**	**141**

*Design/discharge flow exceeds the LC, therefore allocation = (flow contribution from a given source) x (126org/100ml). See sections 4.3.1 and 4.3.2 of the TMDL for details.

#Streamflow is point source dominated, LA assumed to be proportional to the WQS concentration.

TSS

MPCA developed LDCs to calculate the TSS TMDLs for the HCW. The same LDC development strategies were employed for the sediment as those for the *E. coli* TMDLs. The FDCs were transformed into LDCs by multiplying individual flow values by the numeric criteria (10 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 2(B,C) TSS WQS. Using this method, daily loads were developed based upon the flow in the waterbody. Loading capacities were determined for each impaired segment across the 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 across 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 loading during medium to higher flows. This loading primarily attributed to the intensively altered hydrologic conditions in the watershed. The HCW TMDL LDCs show historical exceedances at mid-range flows and above, with two of the assessment units showing exceedance for the entire flow regime (Lower Hawk Creek 07020004-568 and West Fork Beaver Creek 07020004-530).

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 of the TMDL document.

TSS TMDL Tables

Table 4: Total Suspended Solids (TSS) TMDLs for the Hawk Creek Watershed

Allocation	Source	Very High	High	Mid	Low	Very Low
		TSS (lbs/day)				
TMDL for Beaver Creek (07020004-528)						
Wasteload Allocation	Bird Island WWTP	0.21	0.21	0.21	0.21	*
	Danube WWTP	0.12	0.12	0.12	0.12	*
	Olivia WWTP	0.12	0.12	0.12	0.12	*
	Livestock Facilities with NPDES Permits	0	0	0	0	0
	"Straight Pipe" Septic Systems	0	0	0	0	0
	Construction and Industrial Stormwater 1%	0.518	0.133	0.046	0.012	0.00027
	Southern Minnesota Beet Sugar - SD001	0.06	0.06	0.06	0.06	*
	WLA Totals	**0.21**	**0.21**	**0.00**	**0.21**	*****
Load Allocation	Watershed Load	50.772	12.657	4.044	0.678	#
	LA Totals	**50.772**	**12.657**	**4.044**	**0.678**	**#**
Margin of Safety (10%)		**5.8**	**1.5**	**0.5**	**0.1**	**0.003**
Loading Capacity (TMDL)		**56.782**	**14.367**	**4.5446**	**0.988**	**0.03**
TMDL for Chetomba Creek (07020004-589)						

Wasteload Allocation	Blomkest/Svea WWTP	0.08	0.08	0.08	0.08	*
	Prinsburg WWTP	0.01	0.01	0.01	0.01	*
	Roseland WWTP	0.07	0.07	0.07	0.07	*
	Livestock Facilities with NPDES Permits	0	0	0	0	0
	"Straight Pipe" Septic Systems	0	0	0	0	0
	Construction and Industrial Stormwater 1%	0.524	0.109	0.033	0.009	0.00027
	WLA Totals	**0.68**	**0.27**	**0.19**	**0.17**	*****
Load Allocation	Watershed Load	50.772	12.657	4.044	0.678	#
	LA Totals	**50.772**	**12.657**	**4.044**	**0.678**	**#**
Margin of Safety (10%)		**5.8**	**1.5**	**0.5**	**0.1**	**0.003**
Loading Capacity (TMDL)		**57.256**	**14.426**	**4.737**	**0.947**	**0.03**
TMDL for Lower Hawk Creek (07020004-568)						
Wasteload Allocation	Clara City WWTP	0.06	0.06	0.06	0.06	*
	Maynard WWTP	0.02	0.02	0.02	0.02	*
	Pennock WWTP	0.12	0.12	0.12	0.12	*
	Raymond WWTP	0.27	0.27	0.27	0.27	*
	Willmar WWTP	0.94	0.94	0.94	0.94	*
	City of Willmar MS4	1.90	0.60	0.20	0.04	0.00648
	Livestock Facilities with NPDES Permits	0	0	0	0	0
	"Straight Pipe" Septic Systems	0	0	0	0	0
	Construction and Industrial Stormwater 1%	1	0.3	0.07	0.01	0.0036
	WLA Totals	**4.31**	**2.31**	**1.68**	**1.46**	*****
Load Allocation	Watershed Load	94.09	25.49	7.12	1.14	#
	LA Totals	**94.09**	**25.49**	**7.12**	**1.14**	**#**
Margin of Safety (10%)		**10.9**	**3.1**	**1**	**0.3**	**0.04**
Loading Capacity (TMDL)		**109.3**	**30.9**	**9.8**	**2.9**	**0.4**
TMDL for Lower Hawk Creek (07020004-587)						
Wasteload Allocation	Blomkest/Svea WWTP	0.08	0.08	0.08	0.08	*
	Prinsburg WWTP	0.01	0.01	0.01	0.01	*
	Roseland WWTP	0.07	0.07	0.07	0.07	*
	City of Willmar Upstream MS4 Requirements	1.9	0.6	0.2	0.04	0.00648
	Granite Falls Energy LLC	0.02	0.02	0.02	0.02	*
	Livestock Facilities with NPDES Permits	0	0	0	0	0
	"Straight Pipe" Septic Systems	0	0	0	0	0

	Construction and Industrial Stormwater 1%	1.6	0.4	0.1	0.1	0.1
	WLA Totals	**3.68**	**1.18**	**0.48**	**0.32**	*****
Load Allocation	Watershed Load	159.82	41.52	12.42	2.78	#
	LA Totals	**159.82**	**41.52**	**12.42**	**2.78**	**#**
Margin of Safety (10%)		**18.2**	**4.8**	**1.4**	**0.4**	**0.0002**
Loading Capacity (TMDL)		**181.7**	**47.5**	**14.3**	**3.5**	**0.002**
West Fork Beaver Creek (07020004-530)						
Wasteload Allocation	Danube WWTP	0.12	0.12	0.12	0.12	*
	Livestock Facilities with NPDES Permits	0	0	0	0	0
	"Straight Pipe" Septic Systems	0	0	0	0	0
	Construction and Industrial Stormwater 1%	0.3	0.07	0.02	0.005	0.00002
	Southern Minnesota Beet Sugar - SD001	0.06	0.06	0.06	0.06	*
	WLA Totals	**0.42**	**0.19**	**0.14**	**0.13**	*****
Load Allocation	Watershed Load	27.32	6.45	2.00	0.45	#
	LA Totals	**27.32**	**6.45**	**2.00**	**0.45**	**#**
Margin of Safety (10%)		**3.1**	**0.8**	**0.3**	**0.07**	**0.0002**
Loading Capacity (TMDL)		**30.84**	**7.44**	**2.44**	**0.64**	**0.002**

*Design/discharge flow exceeds the LC, therefore allocation = (flow contribution from a given source) x (65mg/1000ml). See Sections 4.3.1 and 4.3.2 of the TMDL for details.

#Streamflow is point source dominated LA assumed to be proportional to the WQS concentration

Total P

MPCA divided Total P loading capacity by WLA, LA (including subparts), and MOS components of the TMDL. These calculations were done for the lakes' critical conditions, the summer growing season, when water quality in each lake is most likely to be degraded and phosphorus loading inputs are the greatest. Therefore, the resulting allocations will protect the HCW lakes during the time of the year with the highest potential for degraded water quality. MPCA also assumes 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 this assumption with its targeted WQS approach for the months of June through September. In addition to the allocations being set for the summer months and Minnesota's WQS reflecting this period, the BATHTUB model is calibrated to the summer growing season.

MPCA calibrated the BATHTUB models with a minimum of two years in-lake data (2011 through 2012). Part of this model calibration included increasing the internal loading in the lakes to better represent in-lake conditions (Section 3.6.3 of the TMDL). These calibrated models were then loaded with flows from the HSPF model to determine the proportional loading for the HCW Total P TMDLs. Using the HSPF models for loading facilitates a more comprehensive picture of the natural system as the HSPF model generates a continuous dataset and serves as a proxy for field measurements. See Appendix B of the TMDL for the BATHTUB models calibrated to historical conditions and to WQS for the TMDL.

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 HCW phosphorus TMDLs. Additionally, EPA concurs with the loading capacities calculated by MPCA in these four 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 of the TMDL.

Total P TMDL Tables

Table 5: Total Phosphorus TMDLs for the Hawk Creek Watershed

Allocation	Source	TP Load	
		(lbs/yr)	*(lbs/day)*
TMDL for Olson Lake (34-0266-00)			
Wasteload Allocation	Construction Stormwater (MNR100001)	1.10	0.003
	Livestock Facilities with NPDES Permits	0	0
	"Straight Pipe" Septic Systems	0	0
	Industrial Process Wastewater	0	0
	WLA Totals	***1.10***	***0.003***
Load Allocation	Nonpoint Runoff	39.7	0.109
	Internal Loading	59.1	0.162
	Atmospheric Deposition	33.1	0.0906
	Tributary Inflow	0	0
	LA Subtotals	***132***	***0.362***
	Additional LA Reductions	***14.1***	***0.039***
	LA Totals	***118***	***0.323***
Margin of Safety (10%)		***13***	***0.036***
Loading Capacity (TMDL)		**131.9**	**0.362**
Existing Load		**214.73**	**0.588**
Percent Load Reduction†		**54%**	**54%**
St Johns Lake (34-0283-00)			
Wasteload Allocation	Construction Stormwater (MNR100001)	12	0.032
	Livestock Facilities with NPDES Permits	0	0
	"Straight Pipe" Septic Systems	0	0
	Industrial Process Wastewater	0	0
	WLA Totals	***12***	***0.032***
Load Allocation	Watershed Runoff	285.9	0.7834
	Internal Loading	550.3	1.508
	Atmospheric Deposition	51.6	0.141

	Tributary Inflow	399.5	1.094
	LA Subtotals	***1287***	***3.526***
	Additional LA Reductions	***141.0***	***0.385***
	LA Totals	***1146***	***3.141***
Margin of Safety (10%)		***129***	***0.353***
Loading Capacity (TMDL)		**1287.3**	**3.5264**
Existing Load		**2587.3**	**7.0886**
Percent Load Reduction†		**52%**	**52%**
TMDL for West Solomon (34-0283-00)			
Wasteload Allocation	Construction Stormwater (MNR100001)	24	0.067
	Livestock Facilities with NPDES Permits	0	0
	"Straight Pipe" Septic Systems	0	0
	Industrial Process Wastewater	0	0
	WLA Totals	***24***	***0.067***
Load Allocation	Watershed Runoff	1030	2.821
	Internal Loading	1499	4.107
	Atmospheric Deposition	150	0.411
	Tributary Inflow	29.3	0.0803
	LA Subtotals	***2708.3***	***7.419***
	Additional LA Reductions	***295***	***0.809***
	LA Totals	***2413***	***6.610***
Margin of Safety (10%)		**271**	**0.742**
Loading Capacity (TMDL)		**2708.3**	**7.4193**
Existing Load		**3805.6**	**10.426**
Percent Load Reduction†		**33%**	**33%**
TMDL for Swan Lake (34-0186-00)			
Wasteload Allocation	Construction Stormwater (MNR100001)	16	0.043
	Livestock Facilities with NPDES Permits	0	0
	"Straight Pipe" Septic Systems	0	0
	Industrial Process Wastewater	0	0
	WLA Totals	***16***	***0.043***
Load Allocation	Watershed Runoff	298.7	0.8184
	Internal Loading	477.5	1.308
	Atmospheric Deposition	54.9	0.150
	Tributary Inflow	907.6	2.487
	LA Subtotals	***1738.7***	***4.763***
	Additional LA Reductions	***189***	***0.519***

	LA Totals	***1550***	***4.244***
	Margin of Safety (10%)	***174***	***0.476***
	Loading Capacity (TMDL)	**1739.7**	**4.7634**
	Existing Load	**2240.1**	**6.1373**
	Percent Load Reduction†	**25%**	**25%**

†Percentages do not include reductions from atmospheric loading

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 has indicated that loading in the HCW is predominantly attributed to nonpoint sources.[14] MPCA further recognized that the LAs for each of the individual TMDLs addressed in the HCW TMDL can be attributed to various nonpoint sources. The LA for these sources is based on the applicable WQS. MPCAs' LA methodology in the HCW 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 concentrations to the LA.

E. coli

The calculated LA values for the *E. coli* TMDLs are applicable across all flow conditions in the HCW. MPCA identified several nonpoint sources which contribute bacteria loads to the surface waters of the HCW, including: natural background levels; nonregulated urban stormwater runoff; stormwater from agricultural and feedlot areas; failing septic systems; and wildlife/pet waste. MPCA did not determine individual load allocation values for each of these nonpoint sources, but primarily aggregated them 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 HCW. 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; atmospheric deposition; and to a lesser extent natural sources from wetlands and forest. 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

The calculated LA values for the Total P TMDLs are applicable to the corresponding summer growing season. MPCA identified several nonpoint sources which contribute Total P loads to the surface

[14] Hawk Creek WRAPS 2017 - https://www.pca.state.mn.us/sites/default/files/wq-ws4-29a.pdf

waters in the HCW. Load allocations were recognized as originating from: failing septic systems; stormwater from agricultural and feedlot areas (manure, fertilizer, erosion of soils); streambank erosion; and atmospheric deposition. MPCA estimated watershed loads, internal loading, and atmospheric loading separately for the LA portions of the Total P TMDLs through the use of the BATHTUB model. Furthermore, as a part of the model calibration, MPCA increased the internal loading in the lake models by 0.29 – 2.45 mg P/m^2 day to better reflection true in-lake conditions. For the Total P loading calculations MPCA calculated these LA sources and reduced the watershed and components to achieve WQS, then further reduced these loads by the MOS and the general construction permit loading. The resulting calculation is the TMDL with necessary LA targets.

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 has indicated that the HCW is predominately impaired due to nonpoint source contamination with minimal historical loading attributed to point sources. The “point sources contributed approximately: less than 1% of sediment, 21% of phosphorus, and 6% of nitrogen to the watershed’s total load delivered to the Minnesota River”[15] These point sources are WWTPs, permitted agricultural and industrial businesses, permitted stormwater discharges from construction, and a city MS4. Additionally, straight pipe septic systems are specifically identified, and assigned a WLA of zero as they are illicit connections. Specific WLAs by flow regime can be found in Section 3 of this document. Lists of the permitted facilities can be found at the end of this Section broken down by source.

MPCA calculates a general WLA for construction and industrial stormwater for 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

[15] Hawk Creek WRAPS 2017 - https://www.pca.state.mn.us/sites/default/files/wq-ws4-29a.pdf

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 0.6% 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.

E. coli

MPCA identified NPDES permitted facilities within the HCW and assigned those facilities a portion of the WLA. According to MPCA the WWTP 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)." For the industrial wastewater source the load was determined in a similar manner to the WWTPs with discharges being calculated based on flow and permit limits. The wasteload allocations for the City of Wilmar MS4 were determined by assigning an area weighted watershed load proportional to the impaired reach drainage area with a land use classification of developed. During lower flow conditions these calculations may assign a greater WLA than the LC of the impaired water. MPCA has stated that the under these flow conditions the actual contribution from these flow sources is minimal and WLA has been based off of a concentration proportional to the flow. EPA has determined that this discharge can be considered criteria end of pipe and therefore not contributing to the *E. coli* impairment. Permitted animal feeding operations and straight pipe septic systems, have received a WLA=0. The individual WLAs for the *E. coli* TMDLs can be found in Sections 4.3 and 4.7.1 of the TMDL and Section 3 of this document.

TSS

MPCA identified NPDES permitted facilities within the HCW and assigned those facilities a portion of the WLA. According to MPCA the WWTP WLA "were determined by multiplying the permit limit of 30 or 45 mg/L by the maximum permitted discharge flow (based on a six inch per day discharge from the facility's secondary ponds)." For the industrial wastewater sources the load was determined in a similar manner to the WWTPs with discharges being calculated based on flow and permit limits. The wasteload allocations for the City of Wilmar MS4 were determined by assigning an area weighted watershed load proportional to the impaired reach drainage area with a land use classification of developed. During lower flow conditions these calculations may assign a greater WLA than the LC of the impaired water. MPCA has stated that the under these flow conditions the actual contribution from these flow sources is minimal and WLA has been based off of a concentration proportional to the flow. EPA has determined that this discharge can be considered criteria end of pipe and therefore not contributing to the TSS impairment. Permitted animal feeding operations and straight pipe septic systems, have received a WLA=0. The individual WLAs for the TSS TMDLs can be found in Sections 4.3 and 4.7.2 of the TMDL and in Section 3 of this document.

Total P

There are no industrial sources contributing to the impaired lakes phosphorus loading, and therefore these source receive a WLA=0. Permitted animal feeding operations and straight pipe septic systems, have also received a WLA=0. The WLA for construction stormwater was assigned based off the above mentioned methodology. The individual WLAs for Total P TMDLs can be found Sections 4.3 and 4.7.3 of the TMDL and in Section 3 of this document.

Permitted Facilities in the HCW

Table 6: Permitted Animal Feeding Operations

NPDES Permitted Animal Feeding Operations in the HCW		
Aggregated HUC12 Subwatershed	**Feedlot Name**	**Permit #**
Chetomba Creek	Country Pork Inc	MNG440187
	Gorans Bros Inc	MNG440432
	Gorans Bros Inc	MNG440432
	Gorans Bros Inc	MNG440111
	Gorans Bros Inc	MNG440432
	Gorans Bros Inc	MNG440432
	Huisinga Farms Inc	MNG440535
	J&C Swine	MNG440841
	Prinsburg Farmers Co-op	MNG440191
	Prinsburg Farmers Co-op	MNG440889
	Prinsburg Farmers Co-op	MNG440893
	Roger Mulder	MNG440838
	Willmar Poultry Co Inc	MNG440744
	Willmar Poultry Co Inc	MNG440745
County Ditch 11	Christensen Farms Midwest LLC	MNG441067
East Fork Beaver Creek	Steve Peterson	MNG440418
	Teri Kubesh	MNG440418
Lower Hawk Creek	Christensen Farms Midwest LLC	MNG440782
	JAM Farms Inc	MNG441055
	Justin Ulferts	MNG440840
	Kleene Farms Inc	MNG440784
	Lone Tree Farm LLC	MNG440473
	Lone Tree Farm LLC	MNG440925
	Riverview LLP	MNG440829
	Ruschen Turkey Inc	MNG440471
	Taatjes Farms Inc	MNG440440
Sacred Heart Creek	Christensen Farms Midwest LLC	MNG441068
	Clay & Lisa Bryan	MNG440491
	Clay & Lisa Bryan	MNG440750
	Christensen Family LLC	MNG440484
	Christensen Farms Midwest LLC	MNG441069
	Country Pork Inc	MNG440452
	Country Pork Inc	MNG440188
	Kevin Rosendahl	MNG440816
	Rembrandt Enterprises Inc	MNG440192
	Rosendahl Feedlots	MNG440488
Sacred Heart Creek - MN River	Kevin & Sandra Malecek Farm – Kevin Site	MNG440478
	Kevin & Sandra Malecek Farm – Sandra Site	MNG440478
	Randall Dolezal Farm	MNG440913
	The Pullet Connection	MNG440474

Tributary to Hawk Creek	Meadow Star Dairy LLP	MNG441065
	Willmar Poultry Co Inc	MNG440116
	Willmar Poultry Company Diagnostic Labra	MNG440117
Upper Hawk Creek	Jennie-O Turkey Store Inc	MNG440595
	Sunnyside Turkeys Inc	MNG440112
	Willmar Poultry Co Inc	MNG440743
	Willmar Poultry Company Diagnostic Labra	MNG440119
West Fork Beaver Creek	Christensen Farms & Feedlots Inc	MNG440433
	Huisinga Farms Inc	MNG440524
	Roger D Kingstrom	MNG440483
	James Hebrink Farm	MNG440841

Table 7: WWTPs

Wastewater Treatment Facilities in the Hawk Creek Watershed			
Aggregated HUC12 Subwatershed	**Stream Reach AUID #**	**Facility**	**Permit #**
Chetomba Creek	07020004-589	Blomkest/Svea	MN0069388
		Prinsburg	MN0063932
		Roseland	MN0070092
Lower Hawk Creek	07020004-587	Blomkest/Svea	MN0069388
		Roseland	MN0070092
		Prinsburg	MN0063932
	07020004-568	Clara City	MN0023035
		Maynard	MN0056588
		Pennock	MNG580104
		Raymond	MN0045446
		Willmar	MN0025259
County Ditch 11	07020004-689	Maynard	MN0056588
Beaver Creek	07020004-528	Bird Island	MN0020737
		Danube	MNG580057
		Olivia	MN0020907
East Fork Beaver Creek	07020004-586	Bird Island	MN0020737
		Olivia	MN0020907
West Fork Beaver Creek	07020004-530	Danube	MNG580057
Sacred Heart Creek	07020004-526	Renville	MN0020737

Table 8: MS4s

Permitted Municipal Separate Storm Sewer Systems		
Aggregated HUC12 Subwatershed	**City**	**Permit #**
Chemtoba	Willmar	MS400272

Lower Hawk Creek	Willmar	MS400272

Table 9: Other Permitted Facilities

Industrial Permitted Facilities in the Hawk Creek Watershed			
Aggregated HUC12 Subwatershed	**Facility Name**	**Facility Type**	**Permit #**
Sacred Heart Creek	Southern Minnesota Beet Sugar - SD009	Beet Sugar Plant	MN0040665
West Fork Beaver Creek	Southern Minnesota Beet Sugar - SD001	Beet Sugar Plant	MN0040665
Lower Hawk Creek	Granite Falls Energy LLC	Ethanol Plant	MN0066800

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 their TMDLs. See Section 4.5 of the TMDL.

E. coli
A 10% explicit margin of safety was established for the HCW *E. coli* TMDLs. MPCA states that the HSPF model used to generate the hydrologic conditions "is an accurate representation of the hydrologic conditions present within the watershed and that the MOS is adequate to account for the model's uncertainty and variability." MPCA noted that "the model was calibrated and validated using seventeen years (1996 through 2012) of flow data … eleven years (1999 through 2009) of water chemistry data." EPA agrees with this MOS due to MPCA's determination that the system is appropriately represented with the HSPF model (Section 4.5 of the TMDL).

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 make quantifying stormwater bacteria loads particularly difficult. The MOS for the HCW bacteria TMDLs also incorporated implicit conservative assumptions in the calculation of the TMDLs. No rate of decay, or die-off rate of pathogen species, were 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[16], many different factors affect the survival

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

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 HCW TSS TMDLs. MPCA states that the HSPF model used to generate the hydrologic conditions "is an accurate representation of the hydrologic conditions present within the watershed and that the MOS is adequate to account for the model's uncertainty and variability." MPCA noted that "the model was calibrated and validated using seventeen years (1996 through 2012) of flow data … eleven years (1999 through 2009) of water chemistry data." EPA agrees with this MOS due to MPCAs determination that the system is appropriately represented with the HSPF model (Section 4.5 of the TMDL).

Total P

A 10% explicit margin of safety was established for the HCW Total P TMDLs. MPCA states that the HSPF model used to generate the hydrologic conditions "is an accurate representation of the hydrologic conditions present within the watershed and that the MOS is adequate to account for the models uncertainty and variability." MPCA noted that "the model was calibrated and validated using seventeen years (1996 through 2012) of flow data … eleven years (1999 through 2009) of water chemistry data." Furthermore, MPCA stated that when the BATHTUB models did not indicate that external inputs to the system were enough to reflect in-lake concentrations, the internal loading component of the models was increased. This is a form of implicit MOS that is incorporated in the modeling process. EPA agrees with this MOS due to MPCAs determination that the system is appropriately represented with the HSPF model (Section 4.5 of the TMDL).

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)).

Comment:

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. Alternatively, loading rates are relatively lower in colder months when bacterial growth rates attenuate, and loading events driven by stormwater runoff events are not as frequent. Bacterial WQS need to be met between April 1st to October 31st, regardless of the flow condition. To achieve this goal, the *E. coli* TMDLs use the LDC methodology. The development of the LDCs utilized simulated flow data which were validated and calibrated with local flow gage data. Modeled flow (HSPF) measurements represent a variety of flow conditions from the recreation season. LDCs developed from these modeled flow conditions represent a range of flow conditions within the HCW and thereby account for seasonal variability over the recreation season.

TSS

The TSS WQS applies from April to September which is also the time period when high concentrations of sediment are expected in the surface waters of the HCW, although there are differences from reach-to-reach. Sediment loading to surface waters in the HCW varies depending on surface water flow, land cover, and climate/season. Typically, in the HCW, sediment transport is attributed to wet weather events. TSS loading comes from overland flow and channel/stream bank 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 streamflow, and the fall brings increasing precipitation and rapidly changing agricultural landscapes. The TSS TMDLs use the LDC methodology. The development of the LDCs utilized simulated flow data which were validated and calibrated with local flow gage data. Modeled flow (HSPF) measurements represent a variety of flow conditions from the growing season. LDCs developed from these modeled flow conditions represent a range of flow conditions within the HCW and thereby account for seasonal variability over the growing season.

Total P

Phosphorus levels in HCW lakes 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 HCW 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 HCW is deficient. By calibrating the modeling efforts to protect these waterbodies 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 (BWSR) administers the CWF and has developed a detailed grants policy explaining what is required to be eligible to receive CWF money[17].

The CWLA also provides details on public and stakeholder participation, and how the funding will be used. In part to attain these goals, the CWLA requires MPCA to develop WRAPS. MPCA views the WRAPS document as a starting point for which MPCA and local partners can develop tools that will help local governments, land owners, and special interest groups determine (1) the best strategies for making improvements and protecting resources that are already in good condition, and (2) focus those strategies in the best places to do work. The WRAPS are required to contain such elements as the identification of impaired waters, watershed modeling outputs, point and nonpoint sources, load reductions, etc.[18, 19] The WRAPS also contain a preliminary implementation table of strategies to achieve loading reductions for both point and nonpoint sources.[20] These tables contain more than needed actions including: a timeline for achieving water quality reductions; reductions needed from both point and nonpoint sources; the governmental units responsible; and interim milestones for achieving the actions. All of the required components can be found in MPCA's WRAPS guidance.[21] The HC WRAPS was

[17] Minnesota Clean Water Fund – http://www.bwsr.state.mn.us/cleanwaterfund/index.html

[18] Chapter 114D.26; CWLA – https://www.revisor.leg.state.mn.us/statutes/?id=114D&view=chapter#stat.114D.26

[19] Clean Water Fund RFP – http://www.bwsr.state.mn.us/cleanwaterfund/index.html

[20] Chapter 114D.26, Subd. 1(8); CWLA – https://www.revisor.leg.state.mn.us/statutes/?id=114D&view=chapter#stat.114D.26

[21] WRAPS Template – https://www.pca.state.mn.us/water/tmdl-policy-and-guidance

approved by MPCA on September 11, 2017.

EPA agrees that the detail provided in the WRAPS document is a sound starting point for providing a focused, comprehensive implementation plan on the watershed scale providing reasonable assurance that load reductions will be achieved. Subsequent work will be done in the watershed by BWSR to further refine implementation at the local level via the development of a HC One Watershed, One Plan (1W1P).[22] Projects to achieve the outlined reductions will be funded through various programs including: Clean Water Fund projects; Clean Water Act Section 319 grants; NRCS programs (EQUIP, etc.); Minnesota Agricultural Water Quality Certification Program (MAWQCP); and other local government cost-share and loan programs.

For the reasons above EPA determines that MPCA has provided reasonable assurance that actions identified in the implementation section of the TMDL (i.e., Sections 8 and 10 of the TMDL document), will be applied to attain the loading capacities and allocations calculated for the impaired reaches within the HCW. EPA anticipates that 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 best management practices (BMPs) to reduce pollutant loading. 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 assumptions and requirements of all WLAs in an approved TMDL. MPCA implements its stormwater 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 (MNR100001). The NPDES program requires construction and industrial sites to create a Stormwater Pollution Prevention Plan (SWPPP) that summarizes how stormwater will be minimized from the site. As a part of this SWPPP, the general permit for construction requires that BMPs are properly selected, installed, and maintained. Furthermore, issues with straight pipe connections have been identified in this watershed. In order to sufficiently address these point sources MPCA has worked directly with the HCW counties through the SSTS Implementation and Enforcement Task Force, which is tasked with identifying the most efficient use of funds to support all onsite treatment compliance.

Nonpoint Sources

MPCA has identified several local partners which have expressed interest in working to reduce nonpoint source pollution within the HCW. The following groups are expected to work closely with one another to ensure that pollutant reduction efforts via BMPs are being implemented within the HCW: local municipal governments; the Chippewa, Kandiyohi, and Renville County Soil and Water Conservation Districts (SWCD); private land owners; local conservation groups; state government; federal government; other nongovernmental organizations (NGOs). BMP implementation will follow the process outlined in the TMDL implementation strategy (see Section 6 of the TMDL and Section 10 of this document) and the Hawk Creek Watershed Project (HCWP).[23]

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[22] BWSR One Watershed, One Plan - http://bwsr.state.mn.us/planning/1W1P/index.html
[23] Hawk Creek Watershed Project - https://www.hawkcreekwatershed.org/

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[24]. This program is comprised of three monitoring programs: Intensive Watershed Monitoring[25], Watershed Pollutant Load Monitoring Network[26], and the Citizen Stream and Lake Monitoring Program[27]. MPCA's statewide monitoring program assesses the state's waters on a ten-year rotating timeframe. This past monitoring created a robust dataset that was used for the model development of the HCW TMDL, and will be used as a baseline to evaluate overall improvements in the watershed. Furthermore, continued water quality monitoring within the basin will provide insight into the success or failure of BMP systems designed to reduce *E. coli*, nutrient and TSS loading into the surface waters of the watershed. Local watershed managers will be able reflect on the progress of the various pollutant removal strategies and would have the opportunity to change course if observed progress is unsatisfactory.

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 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:

As was stated in the Reasonable Assurance section of this Decision Document, the HCWP and the TMDL implementation strategy will guide the efforts to address nonpoint source pollution in the HCW. Some of these restoration plans are already underway such as the 2017 Cover Crop Cost-Share Program.[28] Other past BMPs associated with the HCWP include modifying tile intakes and streambank restoration

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

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

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

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

[28] Hawk Creek Watershed Project - https://www.hawkcreekwatershed.org/

projects.

The HC WRAPS (Section 3 Restoration and Protection), outlines numerous BMPs to be implemented in the HCW, and provides the beginning of a roadmap towards achieving WQS. A list of these practices can be found in Tables 14 A, B of the HC WRAPS document. Furthermore, MPCA indicates that outreach will play a major role in the watershed improvement process with educating stakeholders seen as a means to expand BMP adoption and pollutant awareness.[29]

The findings from the HCW TMDLs, the HC WRAPS, and other existing plans will be used to support local working groups and jointly develop scientifically-supported restoration and protection strategies. Some of this work will culminate in the development of the 1W1P mentioned in the Reasonable Assurance section of this Decision Document. These goals will be accomplished through education and outreach, local ordinances, and BMPs. Various locally specific BMPs and restorations strategies outlined in the existing plans and in Section 8 of the HCW TMDL can be found in the subsections below broken down by pollutant.

E. coli

MPCA's main approach to address bacteria contamination is to increase understanding of the main sources and provide that knowledge to the residents of the watershed. Increased education and outreach to the general public bring greater awareness to the issues surrounding bacteria contamination and strategies to reduce loading and transport of bacteria. Education efforts targeted to the general public are commonly used to provide information on the status of impacted waterways as well as to address pet waste and wildlife issues. Education efforts may emphasize aspects such as cleaning up pet waste or managing the landscape to discourage nuisance congregations of wildlife and waterfowl. Education can also be targeted to municipalities, land managers and other groups who play a key role in the management of bacteria sources. Below are other specific practices identified by MPCA to address bacterial contamination in the HCW.

Pasture Management/Livestock Exclusion Plans – Reducing livestock access to stream environments will lower the opportunity for direct transport of bacteria to surface waters. The installation of exclusion fencing near stream and river environments to prevent direct access for livestock, installing alternative water supplies, and installing stream crossings between pastures, would work to reduce the influxes of bacteria and improve water quality within the watershed. Additionally, introducing rotational grazing to increase grass coverage in pastures, and maintaining appropriate numbers of livestock per acre for grazing, can also aid in the reduction of bacteria inputs.

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

Manure Management Plans – Developing manure management plans can ensure that the storage and application rates of manure are appropriate for land conditions. Determining application rates that take into account the crop to be grown on that particular field and soil type will ensure that the correct

[29] HC WRAPS – https://www.pca.state.mn.us/sites/default/files/wq-ws4-29a.pdf

amount of manure is spread on a field given the conditions. Spreading the correct amount of manure will reduce the availability of bacteria to migrate to surface waters. Furthermore, incorporation of manure after spreading can reduce runoff from rain events.

Feedlot Runoff Controls – Treatment of feedlot runoff via diversion structures, holding/storage areas, and stream buffering areas can all reduce the transmission of bacteria to surface water environments. Additionally, cleaner stormwater runoff can be diverted away from feedlots so as to not liberate bacteria. Renville and Kandiyohi counties have delegated authority to administer MN feedlot and Chippewa Counties program is headed by MPCA. As a preliminary control measure all feedlots are required to register with the state regardless of their permit status.

SSTS – Improvements to septic management programs and educational opportunities can reduce the occurrence of septic pollution. Educating the public on proper septic maintenance, finding and eliminating illicit discharges, and repairing failing systems could lessen the impacts of septic derived bacteria inputs into the HCW.

WWTP – Adherence to the state NPDES permits though on site control mechanisms is seen as a sufficient means of source control from WWTPs. Some plants may need to be updated with newer technologies.

MS4s – Retention basins are seen as the primary mechanism for achieving any necessary MS4 WLA reductions for the HCW. This approach achieves two of the goals in the TMDL by reduce high flow volumes and increasing base flow as the basins slowing recharge the stream segments.

TSS

Sediment in the HCW is primarily a problem from bank erosion. MPCA plans to focus its restoration work in this area along with flow retention ponds. This work will include educating the local population and businesses about the major sources of sediment in the HCW. Examples of proposed practices can be found below.

Reducing Runoff of Sediment – MPCA has identified runoff from cropland as a contributor to TSS loading. Proposed mitigation practices include modifying tile intakes, installing sediment basins, and installation/upkeep of riparian buffers.

Reducing Livestock Access to Streams – Livestock managers should be encouraged to implement measures to protect riparian areas. Managers should install exclusion fencing near stream environments to prevent direct access to these areas by livestock. Additionally, installing alternative watering locations and stream crossings between pastures may aid in reducing sediments to surface waters.

Streambank/Stream Channel Stabilization – Failing streambanks lead to mass wasting events, which are typically the single most dramatic contributor to degraded habitat. Additionally, an unstable stream bank is often a steady source of sediment to the waterbody. Potential solutions include regrading streambanks, hard armoring at risk areas with rip-rap, and seeding barren streambanks. Decreasing channel incision by regrading the stream and streambanks will greatly reduce sediment inputs. An example of previous work includes a HCWP cost-shared project.[30]

WWTP – Adherence to the state NPDES permits though on site control mechanisms is seen as a

[30] Hawk Creek Watershed Project - https://www.hawkcreekwatershed.org/

sufficient means of source control from WWTPs.

MS4s – Retention basins are seen as the primary mechanism for achieving any necessary MS4 WLA in the HCW. Reduction in volume of high flow events should reduce sediment transport and bank destabilization.

Total P

As with TSS and *E. coli* a major component of addressing the phosphorus loading is to educate the watershed inhabitants. For the HCW, phosphorus is associated with both watershed and internal loading. Different approaches are required to control these two sources of Total P loading. Examples of proposed practices for various sources are identified below.

Manure Management (feedlot and manure stockpile runoff controls) – Manure has been identified as a potential source of nutrients in the HCW. Nutrients derived from manure can be transported to surface waterbodies via stormwater runoff. Nutrient laden water can also leach into groundwater resources. Improved strategies in the collection, storage and management of manure can minimize impacts of nutrients entering the surface and groundwater system. Repairing manure storage facilities or building roofs over manure storage areas may decrease the amount of nutrients in stormwater runoff.

Pasture Management and Agricultural Reduction Strategies – These strategies involve reducing nutrient transport from fields and minimizing soil loss. Specific practices would include; erosion control through conservation tillage, reduction of winter spreading of fertilizers, elimination of fertilizer spreading near open inlets and sensitive areas, installation of stream and lake shore buffer strips, streambank stabilization practices (gully stabilization and installation of fencing near streams), and nutrient management planning.

Internal Loading Control Measures – MPCA's control strategies for internal loading include rough fish control, chemical binding of phosphorus (Alum treatments), and a re-establishment of native vegetation. These practices in combination with watershed controls can reduce or eliminate the impact of internal loading on overall lake water quality.

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.

<u>Comment:</u>

The TMDL was on public notice from May 22nd, 2017 to June 21st, 2017. The public comment period was announced in an MPCA news release and published in the Minnesota State Register on May 22nd, 2017. Electronic copies of the draft TMDL were published on the MPCA website along with a notification of the public comment period.

MPCA received four separate comments during the public notice period. One commenter identified typographical errors that MPCA subsequently corrected. The other three comments had more detailed points that are outlined below.

One commenter identified concerns about implementation and the lack of more localized source identification/localized targeted mitigation practices and other concern that were specific to the WRAPS. MPCA indicated that while the implementation practices were broad in nature this is meant to be a stepping stone in the process of plan development with the 1W1P focusing on a more localized approach. Additionally, MPCA included language about the HCWP and its role in involving local groups in BMP implementation.

The Minnesota Department of Agriculture (MDA) had two comments on the HCW TMDL. MDA commented on manure incorporation as a BMP, and MPCA included language about the importance of incorporating manure after application into the final TMDL. Per MDA's request, MPCA also included information about the MN Ag Water Quality Certification Program.

The last commenter expressed concerns about failing SSTS in the HCW and MPCAs capability to locate and mitigate these sources. MPCA indicated that there is a process for identifying these sources along with supporting funding for compliance inspections. MPCA also provided clarifying statistics on the amount of noncompliance in the various counties.

All comments were addressed in letters sent out on August 31st, 2017.

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.

<u>Comment:</u>

On September 14th, 2017, EPA received an electronic submittal letter dated September 12th, 2017 signed by Glenn Skuta, MPCA Watershed Division Director, addressed to Christopher Korleski, EPA Region 5, Water Division Director. The submittal letter identified the Hawk Creek 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 nutrients. These concerns are addressed by the *E. coli*, TSS, and Total P TMDLs in this document. The letter explicitly states that the Hawk Creek Watershed 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 Hawk Creek Watershed for *E. coli*, TSS, Total P meet all of the required elements of an approvable TMDL. This TMDL approval is for **twenty-two TMDLs**: four (4) total phosphorus TMDLs; five (5) TSS TMDLs; and thirteen (13) *E.* coli TMDLs. These TMDLs address impairments for aquatic recreational and aquatic life use impairments as identified on Minnesota's 2014 303(d) list.

U.S. EPA's approval of the Hawk Creek 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.