



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

APR 05 2006

REPLY TO THE ATTENTION OF
WW-16J

Sheryl A. Corrigan, Commissioner
Minnesota Pollution Control Agency
520 Lafayette Road North
St. Paul, Minnesota 55155-4194

Dear Ms. Corrigan:

The United States Environmental Protection Agency (U.S. EPA) has conducted a complete review of the final Revised Regional Total Maximum Daily Load Evaluation of Fecal Coliform Bacteria Impairments in the Lower Mississippi River Basin in Minnesota including supporting documentation and information. Based on this review, U.S. EPA determined that Minnesota's total maximum daily loads (TMDLs) for 39 impaired reaches within the Lower Mississippi River Basin, addressing 39 impairments of fecal coliform, meet the requirements of Section 303(d) of the Clean Water Act and U.S. EPA's implementing regulations at 40 C.F.R. Part 130. Therefore, by this letter, U.S. EPA hereby approves 39 TMDLs addressing 39 impairments on 39 impaired reaches within the Lower Mississippi River Basin. The statutory and regulatory requirements and U.S. EPA's review of Minnesota's compliance with each requirement are described in the enclosed decision document.

We appreciate your hard work in this area and the submittal of the TMDLs as required. If you have any questions, please contact Kevin Pierard, Chief of the Watersheds and Wetlands Branch, at 312-886-4448.

Sincerely yours,

A handwritten signature in cursive script that reads "Jo Lynn Traub".

Jo Lynn Traub
Director, Water Division

Enclosure

cc: Jeff Risberg, MPCA
Faye Sleeper, MPCA
Lee Ganske, MPCA

**Decision Document for Approval of
Revised Regional Total Maximum Daily Load Evaluation of
Fecal Coliform Bacteria Impairments
in the Lower Mississippi River Basin in Minnesota**

Section 303(d) of the Clean Water Act (CWA) and U.S. EPA's implementing regulations at 40 C.F.R. Part 130 describe the statutory and regulatory requirements for approvable total maximum daily loads (TMDLs). Additional information is generally necessary for U.S. EPA to determine if a submitted TMDL fulfills the legal requirements for approval under Section 303(d) and U.S. 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 U.S. 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 U.S. 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 non-point 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 non-point sources, the TMDL should include a description of the natural background. This information is necessary for U.S. 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*

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measures, if applicable. *Surrogate measures* are parameters such as percent fines and turbidity for sediment impairments; chlorophyll *a* and phosphorus loadings for excess algae; length of riparian buffer; or number of acres of best management practices.

Comments:

On November 13, 2002, U.S. EPA approved the Regional TMDL Evaluation of Fecal Coliform Bacteria Impairments in the Lower Mississippi River Basin in Minnesota for 20 impairments. In 2003, the Minnesota Center for Environmental Advocacy (MCEA) challenged U.S. EPA's approval. On June 23, 2005, the United States District Court of Minnesota remanded the TMDL to U.S. EPA for reconsideration. The order from the court included the following:

- The revised TMDL shall be established at a level necessary to implement the applicable water quality standards for each reach impaired with fecal coliform contamination.
- The revised TMDL shall contain a margin of safety that accounts for lack of knowledge concerning the relationship between effluent limitations and water quality.
- The revised TMDL shall properly account for straight pipe septic systems in the waste load allocation of the TMDL.
- The state of Minnesota is allowed 90 days from the date of entry of the final judgment in this case to give public notice of, and to seek comment on, a proposed amended or replacement TMDL.
- The existing TMDL shall remain in force and effect pending completion of the recalculated TMDL.

The subject of this decision document is the Revised Regional TMDL Evaluation of Fecal Coliform Bacteria Impairments in the Lower Mississippi River Basin in Minnesota hereafter referred to as the Revised TMDL. In addition to revising the November 2002 approved TMDL in accordance with the court order, the State is establishing TMDLs for additional reaches. In preparation of Minnesota's 2002 and 2004 303(d) list of impaired waters, the State assessed updated water quality data which led to new determinations of impairment within the Lower Mississippi River Basin. The impaired reaches identified in the Revised TMDL reflect impairment determinations as reported on Minnesota's approved 2004 Integrated Report.

The Revised TMDL establishes allocations for 39 reaches identified as impaired on Minnesota's 2004 Integrated Report. The affected use for all 39 reaches is aquatic recreation with the pollutant/stressor identified as fecal coliform. Table 1 below identifies the 39 reaches as they are listed on Minnesota's 2004 Integrated Report. Minnesota's priority ranking is reflected in its target schedule of TMDL development in the 2004 Integrated Report. Of the 39 impaired reaches identified in the Integrated Report as needing a TMDL to address the affected use of aquatic recreation, all of them have a target TMDL completion date of 2006.

Minnesota developed a methodology for assessing water quality which it uses in making determinations of impairment for purposes of reporting water quality on its Integrated Report. In accordance with its assessment methodology, the State pools water quality data over 10 years when

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determining if a water is meeting its beneficial uses. According to the Revised TMDL, after applying the assessment methodology to the available water quality data the State determined that 34 of the 39 impaired reaches exceeded the geometric mean water quality standard in at least two months, and one more reach exceeded the geometric mean standard in at least one month. The remaining four impaired reaches did not have enough fecal coliform observations to determine compliance with the geometric mean, however, it was determined that these remaining four reaches were identified as impaired due to violations of the single sample maximum standard.

The 39 impaired reaches included in the Revised TMDL are located in southeastern Minnesota, within the Mississippi River Basin, lower portion, and the Cedar River Basin. For purposes of the Revised TMDL these two basins are collectively referred to as the Lower Mississippi River Basin. The Lower Mississippi River Basin covers approximately 7,266 square miles, spanning 17 counties and 12 major watersheds. Approximately 66 percent of the land in the basin is under cultivation, 13 percent is forested, and 17 percent of the land is pasture or open land. Agricultural crops include corn, soybeans and hay. Animal production includes dairy and beef cattle, hogs, sheep and lambs. The total human population in the basin is estimated to be about 640,000, with 77 percent urban and the remaining 23 percent rural. Communities of major populations include the southern metropolitan area of Dakota County, and Austin, Albert Lea, Faribault, Owatonna, Rochester, Red Wing, and Winona. Table 2.1 of the Revised TMDL contains a breakdown by impaired reach of drainage area and land use percentages.

Within the Lower Mississippi River Basin MPCA determined that there are both point and nonpoint sources that potentially contribute fecal coliform bacteria to the impaired reaches. Point sources include mechanical wastewater treatment facilities that operate pursuant to a National Pollutant Discharge Elimination System (NPDES) permit. These facilities include some type of disinfection at the final treatment stage, chlorination, or other similar process. NPDES permits require these facilities to conduct effluent monitoring to ensure that concentrations in the effluent remain below discharge limits. A fecal coliform discharge limit of 200 organisms per 100 milliliters (ml) from April 1 to October 31 is included in these facilities' NPDES permits. Another type of wastewater treatment facility in the basin is a stabilization pond system. Unlike the mechanical systems discussed above, these stabilization pond systems do not have a continuous discharge. Pursuant to applicable NPDES permits these facilities discharge only in the Spring and Fall. The ponds typically discharge for one to two weeks. Table 2 below lists the NPDES wastewater treatment facilities within the impaired reach watersheds that are receiving individual wasteload allocations.

Livestock facilities are considered by MPCA to be both point and nonpoint sources in the Revised TMDL. If a livestock facility is subject to NPDES permitting requirements that particular facility is considered a point source. Presently there are 137 livestock facilities operating under NPDES permits within the basin. Of these 137, 103 facilities are within the impaired reach watersheds. Pursuant to permitting requirements these facilities are designed to totally contain runoff and these facilities have manure management plans. Runoff from land applied manure at these facilities, assuming the manure is applied pursuant to the terms and conditions of the facilities' NPDES permit, is considered a nonpoint source. In addition to livestock facilities operating pursuant to

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NPDES permits, there are many smaller facilities that are not subject to NPDES permit requirements. These smaller facilities, since not subject to NPDES permit requirements, were not considered in the wasteload allocations. These smaller livestock facilities are considered a nonpoint source. Table 3 below identifies livestock facilities subject to NPDES permit requirements in the impaired reach watersheds.

Another type of source which can be considered both point and nonpoint is stormwater runoff from cities, small towns, rural residential, or commercial areas. Stormwater can be a source of fecal coliform bacteria and other pathogens, in addition to many other pollutants. Sources contributing fecal coliform bacteria to stormwater include pet and wildlife waste. Many communities within the impaired reach watersheds are required to obtain Municipal Separate Storm Sewer System (MS4) permits. These permits require the communities to take actions to reduce the impact of stormwater from the community on surface water. Communities subject to MS4 permits within the impaired reach watersheds are considered point sources and receive a wasteload allocation. There are communities within the basin that are not covered under an MS4 permit. These communities are still considered a source of fecal coliform bacteria, however, these communities are not receiving a wasteload allocation. These communities are considered nonpoint sources, thus the load allocation applies.

Individual sewage treatment systems (ISTS) are considered by MPCA to be a source of fecal coliform bacteria within the basin. The State has estimated that 44 percent of the rural population within the basin has inadequate treatment of their household wastewater. Both individual residences and unsewered communities are included in this estimate. These sources are considered by the State to be a significant source of fecal coliform bacteria, especially during periods of low precipitation. Most of these systems fall within the nonpoint source categories. However, pursuant to the June 23, 2005 court decision, systems that have a direct discharge to surface water are considered point sources in the Revised TMDL. These "straight pipe" septic systems can discharge partially treated or untreated sewage. The State considers these "straight pipe" septic systems illegal and un-permitted systems.

In addition to the non-NPDES livestock facilities, ISTS, land applied manure at livestock facilities, and non-MS4 communities runoff from agricultural fields and pastures are also nonpoint sources of fecal coliform bacteria. Manure applied to agriculture fields and animal wastes present in the pastures are sources that contribute fecal coliform bacteria to the impaired reaches through runoff. Wildlife is considered a naturally occurring source of fecal coliform bacteria.

The Revised TMDL did not include specific allocations for future growth. In Section 5.3 of the Revised TMDL the State specifically discussed the impacts of growth on the allocations for "straight pipe" septic systems, wastewater treatment facilities, MS4 communities, and livestock operations. The State did not see a change in the allocation for "straight pipe" septic systems since the current allocation is zero. Through state and local rules and ordinances, actions to minimize the impacts of these sources will continue. Additionally, as communities grow the need for centralized sewage treatment systems will increase which should cause a decrease in these illegal systems. The

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State recognized that as communities grow, flow of some wastewater treatment facilities is likely to increase. Although flows may increase, the NPDES discharge limit of 200 organisms per 100ml will still apply. As growth occurs in communities currently subject to MS4 permits, or as growth subjects additional communities to MS4 permits, the allocations assigned to the MS4 communities may need to be increased. If this situation arises, the State may need to decrease the load allocation assigned to nonpoint sources to provide for an increase in wasteload allocation for MS4 communities. The State recognized that this type of change to the allocations, if needed in the future, is reasonable. As urban areas expand, a decrease in the amount of agricultural and other lands is expected which in turn should decrease the amount of fecal coliform bacteria being contributed from these nonpoint sources. Although Revised TMDL does not account for future growth the State recognized the need to monitor human and livestock population growth, urban expansion and changes in agriculture. The State also recognized that the Revised TMDL could be reopened in the future to adjust the allocations for growth.

U.S. EPA finds that the Revised TMDL submitted by the State of Minnesota satisfy the requirements of this element.

2. Description of the Applicable Water Quality Standards and Numeric Water Quality Target

The TMDL submittal must include a description of the applicable State/Tribal water quality standard, including the designated use(s) of the waterbody, the applicable numeric or narrative water quality criterion, and the antidegradation policy. (40 C.F.R. §130.7(c)(1)).

U.S. 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.

Comments:

All surface waters of Minnesota are assigned classes based upon the water's suitability to support one or more of the seven beneficial uses identified in the Minnesota Rules. All the impaired waters addressed in the Revised TMDL are classified as either Class 2A, 2B, or 2C waters. Minnesota Rules provide the following descriptions of these classes.

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Class 2A: “The quality of Class 2A surface waters shall be such as to permit the propagation and maintenance of a healthy community of cold 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.” Minn. R. ch. 7050.0222 subp. 2.

Class 2B: “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 water is not protected as a source of drinking water.” Minn. R. ch. 7050.0222 subp. 4.

Class 2C: “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 suitable.” Minn. R. ch. 7050.0222 subp. 5.

The specific standards applicable to Class 2A, 2B, and 2C waters are set forth Minn. R. ch. 7050.0222 subp. 2, 4, and 5, respectively. The fecal coliform standard applicable to Class 2A waters is “not to exceed 200 organisms per 100 milliliters as a geometric mean of not less than five samples in any calendar month, nor shall more than ten percent of all samples taken during any calendar month individually exceed 400 organisms per 100 milliliters. The standard applies only between April 1 and October 31.” The fecal coliform standard applicable to Class 2B and 2C waters is “not to exceed 200 organisms per 100 milliliters as a geometric mean of not less than five samples in any calendar month, nor shall more than ten percent of all samples taken during any calendar month individually exceed 2,000 organisms per 100 milliliters. The standard applies only between April 1 and October 31.”

The Revised TMDL is established so that fecal coliform organisms in the impaired reaches shall not exceed 200 organisms per 100 milliliters. The loading capacity for each impaired reach was established using the water quality standard of 200 organisms therefore, the loading capacities have a direct relationship to the water quality standard. The water quality standard also includes a single sample maximum value of 400 or 2000, depending on the use classification. The single sample maximum of 400 or 2000 was not used to establish the Revised TMDL. However, page 20 of the report clearly states that compliance is required with both parts of the standard. Additionally, the assessment methodology used by the State of Minnesota to make determinations of impairment also includes criteria that the State needs to consider before removing a water from the list of impaired waters. The criterion for fecal coliform bacteria includes a requirement that fewer than 10% of sample observations exceed the single sample maximum standards of 400 or 2000 organisms.

The State’s use of the geometric mean in Revised TMDL rather than the single sample maximum standards or both standards is supported by discussion in U.S. EPA’s water quality criteria for

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coastal recreational waters preamble. The preamble states "*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.*" See Fed. Reg. Vol. 69, No. 220, 67224.

In response to a public comment received from MCEA regarding how the single sample maximum values were accounted for in the Revised TMDL, the State did an analysis of the relationship between the two parts of the water quality standard. Actual data from the 39 impaired reaches were used by the State. Looking at all available data for the 39 reaches the State determined that there were 157 months with at least five fecal coliform observations. For these 157 months, the State compared the percent exceedance to the geometric mean. The r-squared value was 0.62. The r-squared value is an indicator of the strength of the relationship between the values being compared, in this case the two portions of the water quality standard. The strength of the relationship increases as the r-squared value nears one. This analysis conducted by the State does not show a 100% correlation between the geometric mean portion of the standard and the single sample maximum, however, it does indicate that a relationship does exist.

U.S. EPA finds that the Revised TMDL submitted by the State of Minnesota satisfies the requirements of this element.

3. Loading Capacity - Linking Water Quality and Pollutant Sources

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

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

The TMDL submittal should contain documentation supporting the TMDL analysis, including the basis for any assumptions; a discussion of strengths and weaknesses in the analytical process; and results from any water quality modeling. U.S. 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 stream flow, loading, and water quality parameters as part of the analysis of loading capacity. (40 C.F.R. §130.7(c)(1)). TMDLs should define applicable *critical conditions* and describe their approach to estimating both point and non-

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point source loadings under such *critical conditions*. In particular, the TMDL should discuss the approach used to compute and allocate non-point source loadings, e.g., meteorological conditions and land use distribution.

Comments:

Loading capacities for each of the 39 impaired reaches were established for five flow zones. Establishing loading capacities for various ranges of flows is appropriate since flow is considered a critical condition which influences the fecal coliform concentrations in the impaired reaches. Sampling results at several monitoring stations within the basin demonstrated a strong correlation between stream flow, precipitation, and fecal coliform bacteria concentrations. Studies in the Vermillion River watershed demonstrated high concentrations of fecal coliform bacteria in samples collected during storm events when compared to samples collected during non-storm events. Other studies within the basin looked at contributions from continuous sources versus weather driven sources during various flow conditions.

Typically loading capacities are expressed as a mass per time, such as tons per year or pounds per day. To establish the loading capacities in the Revised TMDL, Minnesota's water quality standard for fecal coliform was used. Minnesota rules express the fecal coliform standard as a number of organisms per 100ml for a 30 day period. Therefore, the loading capacities established are expressed as a number of organisms per month. Flow records from 14 current and historical U.S. Geological Survey (USGS) gage stations were used by the State to establish the loading capacities. A duration curve analysis was used to identify the loading capacities for each flow zone for each impaired reach. The duration curve analysis is explained in detail in Appendix A of the Revised TMDL. In summary, the duration curve analysis looked at the cumulative frequency of applicable historical flow data for up to 30 years. Flow duration intervals were expressed as percentages, with zero corresponding to the highest stream discharge in the record and 100 corresponding to the lowest stream discharge, flood conditions and drought conditions, respectively. In the Revised TMDL the flow duration intervals were grouped into five zones, high flows (0-10%), moist conditions (10-40%), mid-range flows (40-60%), dry conditions (60-90%), and low flows (90-100%). Use of the flow zones allows for loading capacities to be established for a full range of flow conditions rather than selecting one flow value to represent the range. An additional advantage of using the duration curve flow zones is the ability to relate seasonal variation and source contributions to the loading capacities and allocations. Refer to Table A-5 in Appendix A of the Revised TMDL for an example of this relationship between flow zones, seasonal variation, and source contributions for the Vermillion River.

The loading capacities in the Revised TMDL were calculated by multiplying the median flow of each flow zone by the geometric mean water quality criterion of 200 organisms per 100 ml. A unit conversion factor was also applied to convert the units of organisms per 100 ml and cubic feet per second to organisms per month. The loading capacities are expressed as trillion organisms per month, i.e., tera- or T-org/month. This calculation was done for each flow zone on each impaired reach. Table 4 identifies the approved loading capacities for each flow zone for each of the 39 impaired reaches.

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U.S. EPA finds that the Revised TMDL submitted by the State of Minnesota satisfies the requirements of this element.

4. Wasteload Allocations (WLAs)

U.S. EPA regulations require that a TMDL include wasteload allocations, 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, wasteload allocations may cover more than one discharger, e.g., if the source is contained within a general permit.

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

Comments:

Wasteload allocations were established by the State for wastewater treatment facilities operating pursuant to an NPDES permit, communities subject to MS4 NPDES requirements, livestock facilities requiring NPDES permits, and "straight pipe" septic systems.

Allocations established for wastewater treatment facilities were calculated by multiplying the wet-weather design flows for all the facilities in an impaired reach watershed by the permitted discharge limit of 200 organisms per 100 ml. All wastewater treatment facilities operating under NPDES permits are subject to the 200 organisms per 100 ml discharge limit. In addition to considering the mechanical treatment systems with continuous discharges some stabilization pond systems were considered in establishing the wasteload allocations. These pond systems were assumed to have one month of continuous discharge. Design flows and the discharge limits are constants, these parameters do not vary with flow, therefore the wasteload allocation for wastewater treatment

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facilities for each impaired reach is constant across all five flow zones. Table 4 below identifies a collective wasteload allocation for all facilities within each impaired reaches' watershed. Table 2 identifies individual wasteload allocation for each wastewater treatment facility identified in Revised TMDL. Tables 5.21A through 5.59A and tables 5.21D through 5.59D in the Revised TMDL also identify these wasteload allocations.

Allocations for livestock facilities subject to NPDES permit requirements were established at zero. This zero wasteload allocation is consistent with the conditions of NPDES permits applicable to these facilities. NPDES permits allow no pollutant discharge from the livestock housing facilities and associated site. There is a potential for fecal coliform bacteria to enter the impaired segments through runoff from the land application of manure to the fields at livestock facilities. Runoff from land application of manure at these facilities was considered a nonpoint source in the Revised TMDL.

"Straight pipe" septic systems are considered illegal sources in Minnesota and would not be eligible for a NPDES permit. Therefore, these sources were assigned a zero allocation.

The wasteload allocations for MS4 communities were established after the allocations for wastewater treatment facilities and the margin of safeties were established for each flow zone for each impaired reach. The wastewater treatment facility allocations and the margin of safeties were subtracted from the loading capacity. The remaining capacity is what was available for distribution between the MS4 communities and the nonpoint sources. MS4 wasteload allocations were calculated based upon the percentage of land in an impaired reach watershed that is covered by MS4 permits. A collective wasteload allocation was established for all the MS4 communities in an impaired reach watershed. This collective wasteload allocation was established for each flow zone for each impaired reach. Table 4 below identifies these wasteload allocations established by the State. MS4 communities that were considered in the determining the percentage of land covered by MS4 permits are identified in Tables 5.21C through 5.59C in the Revised TMDL. The total percentage of land used in development of these wasteload allocations is identified in Tables 5.21D through 5.59D of the Revised TMDL.

When the allocations were being established a unique flow situation occurred in three of the impaired reaches, Shell Rock River (07080202-501) and Vermillion River (07040001-506 and 07040001-507). In these reaches the wastewater treatment facility design flows exceeded the minimum stream flow for either the dry and low flow zones or just the low flow zone. In reality the actual wastewater treatment facility would never exceed stream flow since the wastewater treatment facility's flow is a component of stream flow. To address this unique situation the State has established an equation as the wasteload and load allocations for these three segments for the applicable dry and/or low flow zones. The allocations are expressed as the flow contribution from a given source multiplied by 200 organisms per 100ml. For these unique situations the allocations are in essence a concentration based limit. "Straight pipe" septic systems and livestock operations subject to NPDES still receive a wasteload allocation of zero for these three impaired reaches. The sources that will be most impacted by this approach will be MS4 communities and nonpoint

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sources.

U.S. EPA finds that the Revised TMDL submitted by the State of Minnesota satisfies the requirements of this element.

5. Load Allocations (LAs)

U.S. EPA regulations require that a TMDL include LAs, which identify the portion of the loading capacity attributed to existing and future non-point 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 non-point sources.

Comments:

The load allocation component of the Revised TMDL is reported as a single category that includes manure runoff from farm fields, pastures, smaller non-NPDES permitted feedlots, runoff from smaller non-MS4-communities, and fecal coliform contributions from wildlife. As discussed in the wasteload allocation section above, the load allocations were established after the wasteload allocations for wastewater treatment facilities and MS4 communities. After these two wasteload allocations and the margin of safety (MOS) were subtracted from the available loading capacities, the remaining capacity was assigned to the nonpoint source in the load allocation. Load allocations are established for each flow zone for each impaired reach however, individual load allocations for specific nonpoint sources were not established. Table 4 below identifies the load allocations established by the State. Federal TMDL regulations provide for gross allotments as an acceptable load allocation. During the implementation process the State can consider the types of nonpoint sources likely to contribute fecal coliform bacteria under the specific flow conditions defined by the flow zones then direct implementation efforts appropriately. The State does consider wildlife to be a naturally occurring nonpoint source however a separate allocation was not established. The State does recognize that fecal coliform bacteria contributions from wildlife can be found in runoff from both urban and rural lands therefore, implementation efforts to control runoff could have an impact on the wildlife contribution.

U.S. EPA finds that the Revised TMDL submitted by the State of Minnesota satisfies the requirements of this element.

6. Margin of Safety (MOS)

The statute and regulations require that a TMDL include a margin of safety to account for any lack of knowledge concerning the relationship between load and wasteload allocations and water quality (CWA §303(d)(1)(C), 40 C.F.R. §130.7(c)(1)). U.S. 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

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MOS must be described. If the MOS is explicit, the loading set aside for the MOS must be identified.

Comments:

The State recognizes that there may be uncertainty associated with the establishment of Revised TMDL so an explicit margin of safety was established for each of the five flow zones for each impaired reach. The explicit MOS for each flow zone was calculated by calculating the difference between the loading capacity at the mid-flow of each zone and the loading capacity at the minimum flow. Using this difference as an explicit MOS provides that the allocations will not exceed the load associated with the minimum flow in each zone. Table 4 below identifies the explicit MOS.

The uncertainty that the State was accounting for includes variation in stream flows and the situation where a single sample maximum water quality standard is exceeded but the geometric mean standard is not exceeded. The Revised TMDL is a direct function of stream flows therefore establishing an explicit MOS as a function of flow is reasonable. The use of the duration curve approach itself minimizes some of the uncertainty. The five flow zones were created to reflect actual flow conditions, flood through drought conditions. Additionally, the duration curve approach utilizes historical flow data, in some cases up to 30 years of flow data was utilized in establishing the Revised TMDL. By considering actual flow conditions the Revised TMDL is established for conditions which could provide for an exceedance of both the single sample maximum and the geometric mean water quality standards.

U.S. EPA finds that the Revised TMDL submitted by the State of Minnesota satisfies the requirements of this element.

7. Seasonal Variation

The statute and regulations require that a TMDL be established with consideration of seasonal variations. The TMDL must describe the method chosen for including seasonal variations. (CWA §303(d)(1)(C), 40 C.F.R. §130.7(c)(1)).

Comments:

The applicable fecal coliform water quality standards only apply April 1 through October 31. During these seven months stream flow data indicates that seasonal variation does exist. Table A-3 in Appendix A of the Revised TMDL provides the median monthly average unit area flow for the USGS gages considered in development of the Revised TMDL. These unit area flows reflect the seasonal patterns of generally higher flows in April, slightly lower flows in May and June, and then decreasing flows continuing throughout the summer and into the fall. Some gages indicated slight increases in stream flow during September or October. Establishment of the allocations for five different flow zones accounts for seasonal variation.

U.S. EPA finds that the Revised TMDL submitted by the State of Minnesota satisfies the

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requirements of this element.

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 non-point sources, and the wasteload allocation is based on an assumption that non-point source load reductions will occur, U.S. EPA’s 1991 TMDL Guidance states that the TMDL should provide reasonable assurances that non-point source control measures will achieve expected load reductions in order for the TMDL to be approvable. This information is necessary for U.S. EPA to determine that the TMDL, including the load and wasteload allocations, has been established at a level necessary to implement water quality standards.

U.S. EPA’s August 1997 TMDL Guidance also directs Regions to work with States to achieve TMDL load allocations in waters impaired only by non-point sources. However, U.S. EPA cannot disapprove a TMDL for non-point 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.

Comments:

Wasteload allocations were established for wastewater treatment facilities, MS4 communities, livestock operations, and “straight pipe” septic systems. Three of these source categories will operate or do operate pursuant to NPDES permits. Federal regulations require NPDES permits to be issued with effluent limits consistent with available wasteload allocations therefore, the fact that wastewater treatment facilities, MS4 communities and livestock operations operate subject to a NPDES permit provides reasonable assurance. More specifically, NPDES permits currently provide reasonable assurance for wastewater treatment facilities since the permits contain discharge limits established at the water quality standard of 200 organisms per 100 ml. Additionally, wastewater treatment facilities are required to have disinfection with chlorine or ultraviolet radiation. A passive form of disinfection is usually used at treatment facilities operating pond systems, i.e., sunlight provides the ultraviolet radiation. Livestock operations subject to NPDES permitting requirements must be designed to totally contain runoff thus providing reasonable assurance that the zero wasteload allocation will be achieved. Additionally, the State has its own feedlot rules and most counties in the basin are delegated to implement these rules.

The final point source that received a wasteload allocation was “straight pipe” septic systems. Although the Revised TMDL recognizes these sources as point sources the State considers these point sources illegal and unpermitted sources. Since these sources do not operate pursuant to a

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NPDES permit reasonable assurance is actually provided through more traditional nonpoint source mechanisms. The State has received funds through federal grants available through Section 319 of the Clean Water Act to implement programs to educate, provide technical assistance, and financial assistance to owners of failing ISTS. Partnerships have been formed between BALMM (Basin Alliance for the Lower Mississippi in Minnesota), watershed groups, and universities to identify and correct the problems with these sources. Minnesota rule, Minn. R. ch. 7020, sets forth acceptable designs for ISTS. Counties within the basin are delegated to implement these rules. In addition to describing acceptable designs these rules require conformance with state standards for new construction and disclosure of the state of the ISTS when properties transfer ownership. In addition to these state standards several counties require ISTS upgrades at property transfers.

Source specific load allocations were not established in the Revised TMDL rather one gross load allocation was established for all nonpoint sources within each flow zone for each impaired reach. However, the State does identify potential nonpoint sources contributing to the fecal coliform problem in the basin and the State provides reasonable assurance that best management practices can achieve reductions in fecal coliform loads. For livestock operations not subject to NPDES permit requirements the State has identified the Open Lot Agreement as a mechanism to achieve load reductions from these sources. This program provides a framework for feedlots to achieve a 50 percent reduction in runoff by a specified date then full compliance with runoff rules by a future date. Section 319 grants have been obtained to support participation in this program in various counties within the basin.

ISTS that do not have "straight pipe" discharges to surface waters were considered in the Revised TMDL as nonpoint sources. The mechanisms of reasonable assurance that are discussed above for the "straight pipe" septic systems are the same mechanisms that provide reasonable assurance that load reductions can occur from the nonpoint ISTS sources.

Runoff from land application of manure was identified as a nonpoint source of fecal coliform bacteria. Buffer strips, immediate incorporation, and maintenance of surface residue are considered management practices that reduce manure, and consequently pathogen runoff into surface waters. The state feedlot rules set forth at Minn. R. ch. 7020 require recordkeeping for manure application and manure management planning that is specific to the operation. These rules provide reasonable assurance by requiring operators to incorporate better manure management into their operations which in turn should yield better manure application practices thus leading to reductions in pathogens loads through runoff.

Agriculture lands and pastures were also identified as nonpoint sources contributing to the fecal coliform loads entering the impaired reaches. Various management practices have been shown to reduce sediment and fecal coliform loads to surface waters. Since embedded sediment can serve as a substrate for fecal coliform survival reduction in sediment to surface waters can be an effective mechanism for reducing fecal coliform bacteria in surface waters. BALMM has a strategy which calls for implementation of rotational grazing, landscape buffer initiatives, conservation tillage, and urban stormwater runoff controls. Support for rotational grazing and conservation tillage programs

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has been available through Section 319 grants. The Conservation Reserve Enhancement Program provides funding to implement landscape buffer initiatives on conservation easements.

U.S. EPA finds that the Revised TMDL submitted by the State of Minnesota satisfies the requirements of this element.

9. Monitoring Plan to Track TMDL Effectiveness

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

Comments:

Current monitoring plans include basin-wide monitoring consisting of five times per month sampling during the recreational season at Minnesota Milestone sites. This basin-wide monitoring is targeted to be conducted in 2007/2008. A basin wide monitoring was previously conducted in 1997/1998. Additionally, targeted watersheds are scheduled to be monitored in 2008/2009. Low flow sampling is currently planned as part of this targeted watershed monitoring effort. MPCA's regular Milestone monitoring program will continue within the basin pursuant to MPCA's Milestone Monitoring schedule. There are 10 long-term Milestone monitoring sites in the basin which are schedule for monitoring in 2006.

Monitoring plans and schedules may be subject to change upon review of the current implementation plan. The current implementation plan will be reviewed and updated, if necessary, by the State after the approval of the Revised TMDL.

U.S. EPA finds that this section has been adequately addressed in the Revised TMDL, although U.S. EPA is not approving these recommendations for monitoring or any other aspect of Minnesota's monitoring program through this decision.

10. Implementation

U.S. EPA policy encourages Regions to work in partnership with States/Tribes to achieve non-point source load allocations established for 303(d)-listed waters impaired by non-point sources. Regions may assist States/Tribes in developing implementation plans that include reasonable assurances that non-point source LAs established in TMDLs for waters impaired solely or primarily by non-point sources will in fact be achieved. In addition, U.S. EPA policy recognizes that other relevant watershed management processes may be used in the TMDL process. U.S. EPA

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is not required to and does not approve TMDL implementation plans.

Comments:

Upon approval of the original TMDL in November 2002 the State created an implementation plan for achieving the allocations established in the original TMDL. Upon approval of the Revised TMDL the State will begin the process of reviewing and updating the original implementation plan. Local stakeholders will have involvement in this process. The State recognized in the Revised TMDL the need to consider implementation needs to address the “straight pipe” septic systems wasteload allocations and the MS4 communities wasteload allocations. Programs and funding sources that were discussed in the reasonable assurance section above are existing examples of implementation efforts already underway throughout the basin. BALMM has taken an active role in setting goals, developing strategies to achieve the goals, and taking measures to achieve water quality standards for fecal coliform throughout the basin.

U.S. EPA finds that this section has been adequately addressed in the Revised TMDL. U.S. EPA is not, however, required to and does not approve TMDL implementation plans or implementation efforts underway. This decision is not an approval of any recommendations for implementation or active implementation efforts taking place in the basin.

11. Public Participation

U.S. EPA policy is that there should be full and meaningful public participation in the TMDL development process. The TMDL regulations require that each State/Tribe must subject calculations to establish TMDLs to public review consistent with its own continuing planning process (40 C.F.R. §130.7(c)(1)(ii)). In guidance, U.S. EPA has explained that final TMDLs submitted to U.S. 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 U.S. EPA establishes a TMDL, U.S. EPA regulations require U.S. 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 U.S. EPA determines that a State/Tribe has not provided adequate public participation, U.S. EPA may defer its approval action until adequate public participation has been provided for, either by the State/Tribe or by U.S. EPA.

Comments:

The draft Revised TMDL was made available to the public through a 30-day public comment period which began on September 12, 2005 and concluded on October 12, 2005. The general public was made aware of this public comment period through news releases to the major medias in the state, through an announcement in the State Register, and posting of the draft Revised TMDL on MPCA’s website. Numerous local and state level stakeholders were notified through a mass mailing announcing the public comment period. The State received comments from eight parties during the

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30-day comment period. MPCA responded to the comments received from each party. One of the comment letters, submitted by MCEA, requested a public informational meeting. After further communications between MPCA and MCEA, MCEA indicated that a meeting between MCEA and the State, to discuss MCEA's comments on the draft Revised TMDL, would be acceptable. MPCA and MCEA met on November 21, 2005. The final component of public participation took place on January 24, 2006, when the MPCA presented testimony before the Citizen's Board at its public meeting regarding the Revised TMDL. Copies of documents demonstrating the public participation process were included in the Revised TMDL submitted by the State.

U.S. EPA finds that the Revised TMDL submitted by the State of Minnesota satisfies the requirement for adequate public participation.

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 U.S. 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 U.S. EPA review and approval. This clearly establishes the State's/Tribe's intent to submit, and U.S. 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.

Comments:

On March 6, 2006, U.S. EPA received a correspondence dated March 2, 2006, addressed to Ms. Jo Lynn Traub, U.S. EPA, Region 5, and signed by Sheryl A. Corrigan, Commissioner. This correspondence transmitted the Revised TMDL and requested final review and approval. The correspondence stated that the Revised TMDL was being submitted pursuant to Section 303(d) of the Clean Water Act and in "full accordance with the United States District Court's ruling in *Minnesota Center for Environmental Advocacy v. EPA*, No. Civ. 03-5450, 2005 WL 1490331 (D. Minn. Jun. 23, 2005)". The correspondence identified items in the Revised TMDL that addressed requirements of the Court's ruling in addition to identifying the additional impaired reaches which were included in the Revised TMDL.

U.S. EPA finds that the correspondence submitted by the State satisfies the requirements of this twelfth element.

13. Conclusion

After a full and complete review, U.S. EPA finds that the Revised TMDL satisfies the elements of approvable TMDLs. This approval is for 39 reaches that are impaired due to fecal

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coliform bacteria as identified on Minnesota's 2004 303(d) list. A TMDL has been established for each of the 39 impaired reaches and allocations for fecal coliform bacteria that account for both point and nonpoint sources have been established. An explicit margin of safety has also been established for each of the 39 impaired reaches. In an effort to account for the relationship between flow and fecal coliform concentrations in the impaired reaches, the State established the TMDLs, allocations, and margin of safety for each of the 39 impaired reaches at five different flow conditions. Despite the fact that there are many more than 39 specific loading capacities and allocations established in the Revised TMDL, there are only 39 total impairments being addressed. Table 4 below identifies the approved TMDLs.

U.S. EPA's approval of the Revised TMDL extends to the waterbodies which are identified in this decision document and the Revised TMDL 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 Revised TMDL 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.

Decision Document Tables:

- Table 1: Impaired reaches addressed by the Revised TMDL
- Table 2: Wastewater Treatment Facilities and Approved WLAs
- Table 3: Livestock Facilities subject to WLAs
- Table 4: Approved TMDLs

Table 1: Impaired Reaches addressed by the Revised TMDL

Cannon River; Northfield Dam to Lake Byllesby inlet	Upper Mississippi, lower portion	07040002-509	5A
Cannon River; Pine Creek to Belle Creek	Upper Mississippi, lower portion	07040002-502	5B
Cedar River; Roberts Creek to Upper Austin Dam	Cedar	07080201-502	5B
Cedar River; Rose Creek to Woodbury Creek	Cedar	07080201-501	5B
Chub Creek; Headwaters to Cannon River	Upper Mississippi, lower portion	07040002-528	5C
Crane Creek; Headwaters (Watkins Lake) to Straight River	Upper Mississippi, lower portion	07040002-516	5C
Garvin Brook; Class 1B, 2A, 3B portion	Upper Mississippi, lower portion	07040003-542	5B
Logan Branch; End trout stream portion to North Fork Whitewater River	Upper Mississippi, lower portion	07040003-552 ¹	5A
Maple Creek; Headwaters to Straight River	Upper Mississippi, lower portion	07040002-519	5C
Money Creek; End of trout stream portion to Root River	Upper Mississippi, lower portion	07040008-521	5C
Prairie Creek; Headwaters to Cannon River (Lake Byllesby)	Upper Mississippi, lower portion	07040002-504	5B
Robinson Creek; Headwaters to North Branch Root River	Upper Mississippi, lower portion	07040008-503	4A
Root River, South Branch; Headwaters to Class 1B, 2A, 3B	Upper Mississippi, lower portion	07040008-586	5A
Root River, South Branch; Canfield Creek to Willow Creek	Upper Mississippi, lower portion	07040008-555	5A
Root River; Thompson Creek to Mississippi River	Upper Mississippi, lower portion	07040008-501	5B
Rush Creek; Headwaters to Straight River	Upper Mississippi, lower portion	07040002-505	5C
Salem Creek; Lower 15 miles (Class 2C portion) to South Fork Zumbro River	Upper Mississippi, lower portion	07040004-503	4A
Shell Rock River; Albert Lea Lake to Goose Creek	Cedar	07080202-501	5B
Stockton Valley Creek; Trout stream portion to Garvin Brook	Upper Mississippi, lower portion	07040003-559	5C
Straight River; County Ditch #25 to Turtle Creek	Upper Mississippi, lower portion	07040002-517	5C
Straight River; Maple Creek to Crane Creek	Upper Mississippi, lower portion	07040002-503	5B
Straight River; Turtle Creek to Owatonna Dam	Upper Mississippi, lower portion	07040002-535	5A
Straight River; Rush Creek to Cannon River	Upper Mississippi, lower portion	07040002-515	5A
Turtle Creek; Headwaters to Straight River	Upper Mississippi, lower portion	07040002-518	5C
Unnamed Creek; Headwaters to Prairie Creek	Upper Mississippi, lower portion	07040002-512	5C
Unnamed Tributary to Prairie Creek; Unnamed Creek to Unnamed Creek	Upper Mississippi, lower portion	07040002-513	5C
Vermillion River; Below trout stream portion to South Branch Vermillion River	Upper Mississippi, lower portion	07040001-507	4A

Vermillion River; South Branch Vermillion River to the Hastings Dam	Upper Mississippi, lower portion	07040001-506	4A
Whitewater River, South Fork; Headwaters to trout stream portion	Upper Mississippi, lower portion	07040003-505	5B
Whitewater River, South Fork; trout stream portion above North Fork Whitewater River	Upper Mississippi, lower portion	07040003-512	5A
Whitewater River, Middle Fork; trout stream portion	Upper Mississippi, lower portion	07040003-514	5A
Whitewater River, North Fork; Unnamed Creek to Unnamed Creek (below Class 7)	Upper Mississippi, lower portion	07040003-553	5A
Whitewater River, North Fork; unnamed Creek to Middle Fork Whitewater River	Upper Mississippi, lower portion	07040003-554	5B
Zumbro River, South Fork; Cascade Creek to Zumbro Lake	Upper Mississippi, lower portion	07040004-507	5B
Zumbro River; West Indian Creek to Mississippi River	Upper Mississippi, lower portion	07040004-501	5A
Zumbro River, South Fork; Silver Lake Dam to Cascade Creek	Upper Mississippi, lower portion	07040004-533	5C
Zumbro River, South Fork; Bear Creek to Oakwood Dam	Upper Mississippi, lower portion	07040004-535	5C
Zumbro River, South Fork; Salem Creek to Bear Creek	Upper Mississippi, lower portion	07040004-536	5C
Zumbro River; Cold Creek to West Indian Creek	Upper Mississippi, lower portion	07040004-502	5A

Table 2: Wastewater Treatment Facilities and Approved WLAs ²

Wastewater Treatment Facility	Permit Number	Design Flow (mgd)	WLAs (lb orgs/mo)
Cannon Falls WWTP	MN0022993	0.92	0.21
Dennison WWTP	MN0022195	0.029	0.01
Ellendale WWTP	MN0041564	0.1003	0.02
Elysian WWTP	MN0041114	0.0186	0.004
Faribault WWTP	MN0030121	7	1.59
Geneva WWTP	MN0021008	0.069	0.02
Kilkenny WWTP	MNG580084	0.0228	0.01
Lonsdale WWTP	MN0031241	0.2418	0.05
MNDOT Straight River Rest Area	MN0049514	0.0093	0.002
Medford WWTP	MN0024112	0.09	0.02
Morristown WWTP	MN0025895	0.21	0.05
Nerstrand WWTP	MN0065668	0.042	0.01
Northfield WWTP	MN0024368	5.2	1.18
Owatonna WWTP	MN0051284	5	1.14
Waterville WWTP	MN0025208	0.271	0.06
Canton WWTP	MN0023001	0.065	0.01
Chatfield WWTP	MN0021857	0.2725	0.06
Dexter WWTP	MN0023183	0.0454	0.01
Grand Meadow WWTP	MN0023558	0.12	0.03
Haven Hutterian Brethren	MNG580071	0.0112	0.003

Hokah WWTP	MN0021458	0.1	0.02
Houston WWTP	MN0023736	0.25	0.06
Lanesboro WWTP	MN0020044	0.096	0.02
MNDOT Enterprise Rest Area	MN0048844	0.0026	0.001
MNDOT High Forest Rest Area	MN0044377	0.0033	0.001
Mabel WWTP	MN0020877	0.136	0.03
Ostrander WWTP	MN0024449	0.0394	0.01
Peterson WWTP	MN0024490	0.025	0.01
Preston WWTP	MN0020745	0.317	0.07
Racine WWTP	MN0024554	0.039	0.01
Rushford WWTP	MN0024678	0.15	0.03
Spring Valley WWTP	MN0051934	0.936	0.21
Stewartville WWTP	MN0020681	1.111	0.25
Wykoff WWTP	MN0020826	0.049	0.01
Altura WWTP	MN0021831	0.2693	0.06
Utica WWTP	MNG580069	0.04	0.01
Whitewater River Pollution Control Facility	MN0046868	1.12	0.25
Plainview-Elgin Sanitary District WWTP	MN0055361	1.421	0.32
Stockton WWTP	MNG580079	0.07	0.02
Bellechester WWTP	MN0022764	0.0245	0.01
Byron WWTP	MN0049239	0.52	0.12
Camp Victory WWTP	MN0067032	0.03	0.01
Claremont WWTP	MN0022187	0.076	0.02
Dodge Center WWTP	MN0021016	0.973	0.22
Goodhue WWTP	MN0020958	0.0999	0.02
Hallmark Terrace Inc	MNG580070	0.018	0.004
Hammond WWTP	MN0066940	0.02971	0.01
Hayfield WWTP	MN0023612	0.41	0.09
Kasson WWTP	MN0050725	0.84	0.19
Kellogg WWTP	MNG580027	0.06	0.01
Kenyon WWTP	MN0021628	0.357	0.08
Mantorville WWTP	MN0021059	0.0621	0.01
Mazeppa WWTP	MN0046752	0.0723	0.02
Pine Island WWTP	MN0024511	0.665	0.15
Rochester WWTP/Water Reclamation Plant	MN0024619	19.1	4.34
Wanamingo WWTP	MN0022209	0.458	0.10
West Concord WWTP	MN0025241	0.095	0.02
Zumbro Falls WWTP	MN0051004	0.0297	0.01
Zumbro Ridge Estates Mobile Home Park	MN0038661	0.025	0.01
Zumbrota WWTP	MN0025330	0.807	0.18
Lansing Township WWT Improvements	MN0063461	0.026	0.006
Blooming Prairie WWTP	MN0021822	0.899	0.20
Brownsdale WWTP	MN0022934	0.184	0.04
Elkton WWTP	MNG580013	0.017	0.004
Hollandale WWTP	MN0048992	0.0427	0.01
Austin WWTP	MN0022683	8.475	1.92
Oakland Sanitary District WWTP	MN0040631	0.0121	0.003
Sargeant WWTP	MN0021601	0.0106	0.002
Waltham WWTP	MN0025186	0.027	0.01
Rose Creek WWTP	MNG580072	0.065	0.01

Clarks Grove WWTP	MNG580067	0.1164	0.026
Albert Lea WWTP	MN0041092	18.38	4.17
Glenville WWTP	MN0021245	0.13	0.03
Hayward WWTP	MN0041122	0.045	0.010
MDNR Myre Big Island State Park	MN0033740	0.01	0.002
Elko/New Market WWTP	MN0056219	0.98	0.22
Hampton WWTP	MN0021946	0.101	0.02
Met Council - Empire WWTP	MN0045845	28.61	6.50
Vermillion	MN0025101	0.054	0.01

Table 3: Livestock Facilities subject to WLAs in the Revised TMDL³

Facility	ID Number
Matthew Hanson Farm	131-104880
Fern Peterson Farm	049-73087
Hovel Farms - Sec 33	049-82020
Randall S Rauk Farm	049-50008
Scott Gustafson Farm	049-50005
Tim and Marvin D Donkers Farm	049-72775
Gibbs Farms Inc	079-80335
Koppelman Farm's Inc	079-50006
MN Dak Farms	079-66313
Eastgate Farms - Sec 32 - Main	131-93622
Jennie-O Turkey Store - Lakeview	131-93683
Jennie-O Turkey Store - Valleyview	131-50007
Kent Holden Farm	131-93843
Jennie-O Turkey Store - Hillcrest Farm	131-50006
Ahlman Hog Farm Sec 11	147-50002
Heers Family Farm	147-50006
Jennie-O Turkey Store - Merton Farm	147-50008
Steven Jaster Farm	147-50005
Charles Zimmerman Farm - Sec 15	131-93142
Holden Farms - Fallbro - Sec 17	131-93606
Holden Farms Inc - Fallingbrook Facility	131-50005
P & J Products Co - Site III	131-50004
Bruce Peterson Farm - Sec 34	131-93620
Chad Johnson Farm	047-102279
Brian Waage Farm	147-50003
J&K Farms LLC	147-92330
Jeff Ptacek Farm - Sec 36	147-92217
Shane & Rod Wagner Farm - Sec 15	147-92127
Brian J Kosel Farm - Sec 23	147-92323
Jennie-O Turkey Store - Deerfield Farm	147-50007
Wingspan LLP	161-50012
Woodville Pork	161-50011
Allen & Kevin Marzolf Farm - Sec 30	045-90428
Helen Anderson Farm - Sec 36	045-91101
Hellickson Farms	045-63730
Jennie-O Turkey Store - Benson Farm	045-50004

Jennie-O Turkey Store - Chatfield Farm	045-50003
Jennie-O Turkey Store - Fay Farm	045-50002
Marzolf Farm	045-60160
Palmer Growout Farm - Sec 14	045-101381
Palmer Growout Farm - Sec 8	045-101373
Palmer Growout Farm - Sec 8 NW	045-101374
Paul Schmidt Farm - Sec 20	045-90124
Ridge Land Farm	045-50001
John Oehlke Pork Farm	099-83512
Larson Products Inc - Sec 5	099-61683
Vance Larson Farm 1	099-95037
Lo-Mill Farms	109-79271
Jennie-O Turkey Store - Lingenfelter	169-50005
Smith Farms of Rushford Inc	169-50001
Smith Farms of Rushford LLP	169-102822
Holden Farms Inc.	169-60300
Gar-Lin Dairy Site 1	109-82692
Daley Farms of Lewiston LLP	169-50002
Craig and Caryl Bendix Farm - Sec 10	039-81804
Craig and Caryl Benedix Farm	039-81805
Craig and Caryl Benedix Farm - Sec 4	039-81794
Daley Farms - Pine Island	039-81902
Durst Bros Dairy - Site I	039-50010
Grandview Hogs of Dodge Center LLP	039-50005
Hutton Farms Inc	039-50002
Jennie-O Turkey Store - Claremont East	039-50006
Jennie-O Turkey Store - Claremont West	039-50008
Ripley Dairy LLP	039-81909
Toden Farms - Milton Yard	039-81850
Toquam Hogs - Barn 2	039-81920
VZ Hogs LLP	039-50004
Wilbert Kern Farm	039-80286
Belvidere Group Partners Farm	049-72978
Bombay Dairy Company Farm	049-72726
Darvin J Amundson Farm	049-72585
Donnie L Dohrn Farm	049-73262
Gene Knott Farm	049-72619
Knott Farms	049-50007
Kohlhofer Farms Inc - Site I	049-50002
Kohlhofer Farms Inc - Site III	049-50004
Mike Kohlhofer Farm	049-72976
Minnesota Family Farms Coop	049-50001
Jerome Foods Inc 3	109-78747
Manco of FMT Inc	109-50005
Manco of FMT Inc 2	109-82696
Schoenfelder Farms 10	109-79242
Schoenfelder Farms LLP - Roch	109-87100
David C Johnson Farm	131-50001
Jon W Brower Farm Sec 36	147-61682
Shane Wagner Farm - Sec 23	147-92125
Dan & Matt Arendt Farm	157-94002
Gary Lehnertz Farm	157-86816

McNallan Dairy	157-94000
Kenneth Schumacher Farm	157-86651
Roland Kittleson Farm	039-50003
Dennis Magnuson & MHF Free Co - Sec 35	047-96992
Dennis Magnuson Farm	047-50008
Dennis Magnuson Farm - Sec 35 NE	047-96991
Hanson Hog Farm	047-96951
Natural Pork Production II LLP - Austin	047-50005
North Farm	047-50007
Bob Bartel Farm Sec 22	099-60649
Geo A Hormel & Co Farm	099-83267
John Nielsen Farm - Site 2	099-93981
Paul Meany Farm - Sec 15	099-50001
Yunker Farms	099-83464
MJC Farms	147-50001

Table 4: Approved TMDLs⁴

Impaired Water Body	Assessment Unit ID	Description	TMDL Category				
			High Flow Zone (1-0.95/mb)	Mid Flow Zone (1-0.95/mb)	Low Flow Zone (1-0.95/mb)	Off-Flow Zone (1-0.95/mb)	
Cannon River; Northfield Dam to Lake Bylesby inlet	07040002-509	Total Monthly Loading Capacity	273.01	98.81	46.19	21.84	10.05
		WLA - permitted WWTF	4.14	4.14	4.14	4.14	4.14
		WLA - MS4 communities	6.82	2.47	1.07	0.35	0.11
		WLA - Livestock Operations	0	0	0	0	0
		WLA - "Straight Pipe" Septic Systems	0	0	0	0	0
		LA	167.38	60.70	26.31	8.56	2.62
MOS	94.67	31.50	14.67	8.79	3.18		
Cannon River; Pine Creek to Belle Creek	07040002-502	Total Monthly Loading Capacity	395.39	143.11	66.89	31.63	14.55
		WLA - permitted WWTF	4.37	4.37	4.37	4.37	4.37
		WLA - MS4 communities	6.86	2.52	1.12	0.39	0.15
		WLA - Livestock Operations	0	0	0	0	0
		WLA - "Straight Pipe" Septic Systems	0	0	0	0	0
		LA	247.07	90.61	40.16	14.14	5.42
MOS	137.10	45.62	21.25	12.73	4.61		
Cedar River; Roberts Cr to Upper Austin Dam	07080201-502	Total Monthly Loading Capacity	66.38	24.95	11.67	5.88	3.21
		WLA - permitted WWTF	0.22	0.22	0.22	0.22	0.22
		WLA - MS4 communities	0	0	0	0	0
		WLA - Livestock Operations	0	0	0	0	0
		WLA - "Straight Pipe" Septic Systems	0	0	0	0	0
		LA	50.41	15.50	8.55	3.58	1.98
MOS	15.75	9.23	2.90	2.08	1.01		
Cedar River; Rose Cr to Woodbury Cr	07080201-501	Total Monthly Loading Capacity	195.38	73.42	34.36	17.30	9.45
		WLA - permitted WWTF	2.22	2.22	2.22	2.22	2.22
		WLA - MS4 communities	2.92	0.88	0.47	0.18	0.08
		WLA - Livestock Operations	0	0	0	0	0
		WLA - "Straight Pipe" Septic Systems	0	0	0	0	0
		LA	143.88	43.16	23.13	8.80	4.17
MOS	46.36	27.17	8.54	6.11	2.98		

Impaired Reach	Assessment Unit ID	TMDL Allocations/MOS	TMDL Allocations/MOS				
			High Flow Zone (t-org/mo)	Molst Flow Zone (t-org/mo)	Mid Flow Zone (t-org/mo)	Dry Flow Zone (t-org/mo)	Low Flow Zone (t-org/mo)
Chub Creek; Headwaters to Cannon River	07040002-528	Total Monthly Loading Capacity	23.79	10.68	4.99	1.90	0.70
		WLA - permitted WWTF	0	0	0	0	0
		WLA - MS4 communities	0	0	0	0	0
		WLA - Livestock Operations	0	0	0	0	0
		WLA - "Straight Pipe" Septic Systems	0	0	0	0	0
		LA	17.74	6.76	3.27	0.91	0.34
		MOS	6.05	3.92	1.72	0.99	0.36
Crane Creek; Headwaters (Watkins Lk) to Straight River	07040002-516	Total Monthly Loading Capacity	39.38	17.68	8.26	3.14	1.16
		WLA - permitted WWTF	0	0	0	0	0
		WLA - MS4 communities	1.37	0.52	0.25	0.07	0.03
		WLA - Livestock Operations	0	0	0	0	0
		WLA - "Straight Pipe" Septic Systems	0	0	0	0	0
		LA	27.99	10.67	5.16	1.43	0.53
		MOS	10.02	6.49	2.85	1.64	0.60
Garvin Brook; Class 1B, 2A, 3B portion	07040003-542	Total Monthly Loading Capacity	7.55	5.84	5.22	4.85	3.56
		WLA - permitted WWTF	0.02	0.02	0.02	0.02	0.02
		WLA - MS4 communities	0	0	0	0	0
		WLA - Livestock Operations	0	0	0	0	0
		WLA - "Straight Pipe" Septic Systems	0	0	0	0	0
		LA	6.28	5.53	5.13	3.95	3.20
		MOS	1.25	0.29	0.07	0.88	0.34
Logan Branch; End trout stream portion to North FK Whitewater R	07040003-552	Total Monthly Loading Capacity	3.01	1.39	0.94	0.73	0.45
		WLA - permitted WWTF	0	0	0	0	0
		WLA - MS4 communities	0	0	0	0	0
		WLA - Livestock Operations	0	0	0	0	0
		WLA - "Straight Pipe" Septic Systems	0	0	0	0	0
		LA	2.25	1.09	0.87	0.53	0.34
		MOS	0.76	0.30	0.07	0.20	0.11

Impaired Reach	Assessment ID	TMDL Allocation (MOS)	TMDL Allocation (MOS)				
			High Flow Zone (cfs/mo)	Moist Flow Zone (cfs/mo)	Mid Flow Zone (cfs/mo)	Daily Flow (cfs)	
Maple Creek; Headwaters to Straight R	07040002-519	Total Monthly Loading Capacity	14.36	6.45	3.01	1.14	0.42
		WLA - permitted WWTF	0	0	0	0	0
		WLA - MS4 communities	1.58	0.60	0.29	0.08	0.03
		WLA - Livestock Operations	0	0	0	0	0
		WLA - "Straight Pipe" Septic Systems	0	0	0	0	0
		LA	9.13	3.48	1.68	0.46	0.17
		MOS	3.65	2.37	1.04	0.60	0.22
Money Creek; End of trout stream portion to Root R	07040008-521	Total Monthly Loading Capacity	7.66	4.99	3.81	3.25	2.72
		WLA - permitted WWTF	0	0	0	0	0
		WLA - MS4 communities	0	0	0	0	0
		WLA - Livestock Operations	0	0	0	0	0
		WLA - "Straight Pipe" Septic Systems	0	0	0	0	0
		LA	6.10	4.14	3.55	2.95	2.42
		MOS	1.56	0.85	0.26	0.30	0.30
Prairie Creek; Headwaters to Cannon R (Lk Byllesby)	07040002-504	Total Monthly Loading Capacity	29.65	13.31	6.22	2.36	0.87
		WLA - permitted WWTF	0.01	0.01	0.01	0.01	0.01
		WLA - MS4 communities	0	0	0	0	0
		WLA - Livestock Operations	0	0	0	0	0
		WLA - "Straight Pipe" Septic Systems	0	0	0	0	0
		LA	22.10	8.41	4.06	1.11	0.41
		MOS	7.54	4.89	2.15	1.24	0.45
Robinson Creek; Headwaters to N Br Root R	07040008-503	Total Monthly Loading Capacity	5.93	2.64	1.42	0.81	0.29
		WLA - permitted WWTF	0	0	0	0	0
		WLA - MS4 communities	0	0	0	0	0
		WLA - Livestock Operations	0	0	0	0	0
		WLA - "Straight Pipe" Septic Systems	0	0	0	0	0
		LA	4.72	1.80	1.15	0.49	0.16
		MOS	1.21	0.84	0.27	0.32	0.13

Impaired Reach	SUDID	Total Monthly Loading Capacity	TMDL Allocation / MOS				
			WLA Zone (lb/d/mo)	MS4 Zone (lb/d/mo)	LA Zone (lb/d/mo)	MOS (lb/d/mo)	
Salem Creek; Lower 15 miles (Class 2C portion) to South Fork Zumbro R	07040004-503	Total Monthly Loading Capacity	21.73	9.69	5.22	2.98	1.07
		WLA - permitted WWTF	0	0	0	0	0
		WLA - MS4 communities	0	0	0	0	0
		WLA - Livestock Operations	0	0	0	0	0
		WLA - "Straight Pipe" Septic Systems	0	0	0	0	0
		LA	17.30	6.59	4.23	1.82	0.60
		MOS	4.43	3.10	0.99	1.16	0.47
Shell Rock River; Albert Lea Lk to Goose Cr	07080202-501	Total Monthly Loading Capacity	56.33	25.28	11.55	3.88	1.63
		WLA - permitted WWTF	4.24	4.24	4.24	3	3
		WLA - MS4 communities	2.70	0.72	0.25	3	3
		WLA - Livestock Operations	0	0	0	0	0
		WLA - "Straight Pipe" Septic Systems	0	0	0	0	0
		LA	39.39	10.47	3.60	3	3
		MOS	9.99	9.85	3.46	-----	-----
Stockton Valley Creek; Trout stream portion to Garvin Br	07040003-559	Total Monthly Loading Capacity	2.20	1.41	1.10	0.95	0.68
		WLA - permitted WWTF	0	0	0	0	0
		WLA - MS4 communities	0	0	0	0	0
		WLA - Livestock Operations	0	0	0	0	0
		WLA - "Straight Pipe" Septic Systems	0	0	0	0	0
		LA	1.95	1.22	1.05	0.78	0.56
		MOS	0.25	0.19	0.05	0.17	0.12
Straight River; CD #25 to Turtle Cr	07040002-517	Total Monthly Loading Capacity	50.27	22.57	10.54	4.01	1.48
		WLA - permitted WWTF	0.04	0.04	0.04	0.04	0.04
		WLA - MS4 communities	0	0	0	0	0
		WLA - Livestock Operations	0	0	0	0	0
		WLA - "Straight Pipe" Septic Systems	0	0	0	0	0
		LA	37.44	14.25	6.86	1.87	0.68
		MOS	12.79	8.28	3.64	2.10	0.76

Impaired Reach	Assessment Unit ID	TMDL/Allocations/MOS	TMDL/Allocations/MOS				
			High Flow Zone (t-org/mo)	Monist Flow Zone (t-org/mo)	Mid Flow Zone (t-org/mo)	Low Flow Zone (t-org/mo)	
Straight River; Maple Creek to Crane Creek	07040002-503	Total Monthly Loading Capacity	93.99	42.19	19.71	7.49	2.77
		WLA - permitted WWTF	1.18	1.18	1.18	1.18	1.18
		WLA - MS4 communities	3.46	1.28	0.59	0.12	0.01
		WLA - Livestock Operations	0	0	0	0	0
		WLA - "Straight Pipe" Septic Systems	0	0	0	0	0
		LA	65.45	24.24	11.14	2.27	0.16
MOS	23.91	15.49	6.81	3.92	1.43		
Straight River; Turtle Cr to Owatonna Dam	07040002-535	Total Monthly Loading Capacity	76.05	34.14	15.94	6.06	2.24
		WLA - permitted WWTF	0.04	0.04	0.04	0.04	0.04
		WLA - MS4 communities	1.17	0.45	0.21	0.06	0.02
		WLA - Livestock Operations	0	0	0	0	0
		WLA - "Straight Pipe" Septic Systems	0	0	0	0	0
		LA	55.49	21.12	10.17	2.79	1.03
MOS	19.35	12.53	5.51	3.17	1.15		
Straight River; Rush Creek to Cannon River	07040002-515	Total Monthly Loading Capacity	171.86	77.15	36.03	13.70	5.06
		WLA - permitted WWTF	2.79	2.79	2.79	2.79	2.79
		WLA - MS4 communities	4.84	1.78	0.80	0.14	0
		WLA - Livestock Operations	0	0	0	0	0
		WLA - "Straight Pipe" Septic Systems	0	0	0	0	0
		LA	120.52	44.27	19.99	3.60	0
MOS	43.72	28.32	12.45	7.17	2.27		
Turtle Creek; Headwaters to Straight R	07040002-518	Total Monthly Loading Capacity	16.41	7.37	3.44	1.31	0.48
		WLA - permitted WWTF	0	0	0	0	0
		WLA - MS4 communities	0	0	0	0	0
		WLA - Livestock Operations	0	0	0	0	0
		WLA - "Straight Pipe" Septic Systems	0	0	0	0	0
		LA	12.23	4.67	2.25	0.63	0.23
MOS	4.18	2.70	1.19	0.68	0.25		

Impaired Segment	ID	Description	TMDL/Allocations/MOS			1.07
			High Flow Zone (kg/d/mo)	Moody Flow Zone (kg/d/mo)	Watershed Zone (kg/d/mo)	
Salem Creek; Lower 15 miles (Class 2C portion) to South Fk Zumbro R	07040004-503	Total Monthly Loading Capacity	21.73	9.69	5.22	2.98
		WLA - permitted WWTF	0	0	0	0
		WLA - MS4 communities	0	0	0	0
		WLA - Livestock Operations	0	0	0	0
		WLA - "Straight Pipe" Septic Systems	0	0	0	0
		LA	17.30	6.59	4.23	1.82
		MOS	4.43	3.10	0.99	1.16
Shell Rock River; Albert Lea Lk to Goose Cr	07080202-501	Total Monthly Loading Capacity	56.33	25.28	11.55	3.88
		WLA - permitted WWTF	4.24	4.24	4.24	3
		WLA - MS4 communities	2.70	0.72	0.25	3
		WLA - Livestock Operations	0	0	0	0
		WLA - "Straight Pipe" Septic Systems	0	0	0	0
		LA	39.39	10.47	3.60	3
		MOS	9.99	9.85	3.46	-----
Stockton Valley Creek; Trout stream portion to Garvin Br	07040003-559	Total Monthly Loading Capacity	2.20	1.41	1.10	0.95
		WLA - permitted WWTF	0	0	0	0
		WLA - MS4 communities	0	0	0	0
		WLA - Livestock Operations	0	0	0	0
		WLA - "Straight Pipe" Septic Systems	0	0	0	0
		LA	1.95	1.22	1.05	0.78
		MOS	0.25	0.19	0.05	0.17
Straight River; CD #25 to Turtle Ct	07040002-517	Total Monthly Loading Capacity	50.27	22.57	10.54	4.01
		WLA - permitted WWTF	0.04	0.04	0.04	0.04
		WLA - MS4 communities	0	0	0	0
		WLA - Livestock Operations	0	0	0	0
		WLA - "Straight Pipe" Septic Systems	0	0	0	0
		LA	37.44	14.25	6.86	1.87
		MOS	12.79	8.28	3.64	2.10

Impaired Reach	Assessment Unit ID	TMDL/Allocations/MOS					
		High Flow Zone (t-org/mo)	Moist Flow Zone (t-org/mo)	Mid Flow Zone (t-org/mo)	Dry Flow Zone (t-org/mo)	Other Zone (t-org/mo)	
Straight River; Maple Cr eek to Crane Creek	07040002-503	Total Monthly Loading Capacity	93.99	42.19	19.71	7.49	2.77
		WLA – permitted WWTF	1.18	1.18	1.18	1.18	1.18
		WLA – MS4 communities	3.46	1.28	0.59	0.12	0.01
		WLA – Livestock Operations	0	0	0	0	0
		WLA – “Straight Pipe” Septic Systems	0	0	0	0	0
		LA	65.45	24.24	11.14	2.27	0.16
		MOS	23.91	15.49	6.81	3.92	1.43
Straight River; Turtle Cr to Owatonna Dam	07040002-535	Total Monthly Loading Capacity	76.05	34.14	15.94	6.06	2.24
		WLA – permitted WWTF	0.04	0.04	0.04	0.04	0.04
		WLA – MS4 communities	1.17	0.45	0.21	0.06	0.02
		WLA – Livestock Operations	0	0	0	0	0
		WLA – “Straight Pipe” Septic Systems	0	0	0	0	0
		LA	55.49	21.12	10.17	2.79	1.03
		MOS	19.35	12.53	5.51	3.17	1.15
Straight River; Rush Creek to Cannon River	07040002-515	Total Monthly Loading Capacity	171.86	77.15	36.03	13.70	5.06
		WLA – permitted WWTF	2.79	2.79	2.79	2.79	2.79
		WLA – MS4 communities	4.84	1.78	0.80	0.14	0
		WLA – Livestock Operations	0	0	0	0	0
		WLA – “Straight Pipe” Septic Systems	0	0	0	0	0
		LA	120.52	44.27	19.99	3.60	0
		MOS	43.72	28.32	12.45	7.17	2.27
Turtle Creek; Headwaters to Straight R	07040002-518	Total Monthly Loading Capacity	16.41	7.37	3.44	1.31	0.48
		WLA – permitted WWTF	0	0	0	0	0
		WLA – MS4 communities	0	0	0	0	0
		WLA – Livestock Operations	0	0	0	0	0
		WLA – “Straight Pipe” Septic Systems	0	0	0	0	0
		LA	12.23	4.67	2.25	0.63	0.23
		MOS	4.18	2.70	1.19	0.68	0.25

Impaired Segment	Impaired Segment ID	Description	TMDL Allocation (lb/d)		
			High Flow Zone (5-07g/mo)	Worst Flow Zone (5-07g/mo)	Normal Flow Zone (5-07g/mo)
Unnamed Creek; Headwaters to Prairie Cr	07040002-512	Total Monthly Loading Capacity	6.53	2.93	1.37
		WLA - permitted WWTF	0.01	0.01	0.01
		WLA - MS4 communities	0	0	0
		WLA - Livestock Operations	0	0	0
		WLA - "Straight Pipe" Septic Systems	0	0	0
		LA	4.86	1.84	0.89
MOS	1.66	1.08	0.47		
Unnamed Tributary to Prairie Cr; Unnamed Cr to Unnamed Cr	07040002-513	Total Monthly Loading Capacity	4.66	2.09	0.98
		WLA - permitted WWTF	0	0	0
		WLA - MS4 communities	0	0	0
		WLA - Livestock Operations	0	0	0
		WLA - "Straight Pipe" Septic Systems	0	0	0
		LA	3.47	1.32	0.64
MOS	1.19	0.77	0.34		
Vermillion River; Below trout stream portion to S Br Vermillion	07040001-507	Total Monthly Loading Capacity	34.79	16.95	10.29
		WLA - permitted WWTF	6.72	6.72	6.72
		WLA - MS4 communities	5.99	1.57	0.36
		WLA - Livestock Operations	0	0	0
		WLA - "Straight Pipe" Septic Systems	0	0	0
		LA	15.34	4.02	0.92
MOS	6.74	4.64	2.29		
Vermillion River; S Br Vermillion R to the Hastings Dam	07040001-506	Total Monthly Loading Capacity	66.71	32.50	19.74
		WLA - permitted WWTF	6.75	6.75	6.75
		WLA - MS4 communities	8.62	3.09	1.57
		WLA - Livestock Operations	0	0	0
		WLA - "Straight Pipe" Septic Systems	0	0	0
		LA	38.41	13.76	7.02
MOS	12.93	8.90	4.39		

Impaired Reach	Assessment Unit ID	TMDL/Allocations/MOS				
		High Flow Zone (1-org/mo)	Moist Flow Zone (1-org/mo)	Mid Flow Zone (1-0.75/mo)	Low Flow Zone (1-0.25/mo)	Very Low Zone (1-0.07/mo)
Whitewater River, South Fork; Headwaters to trout stream portion	07040003-505	6.93	3.36	2.10	1.50	1.18
		0.25	0.25	0.25	0.25	0.25
		0	0	0	0	0
		0	0	0	0	0
		4.84	2.16	1.57	1.05	0.71
		1.84	0.95	0.28	0.20	0.22
Whitewater River, South Fork; trout stream portion above N Fk Whitewater R	07040003-512	11.68	5.66	3.53	2.53	1.98
		0.32	0.32	0.32	0.32	0.32
		0	0	0	0	0
		0	0	0	0	0
		8.25	3.74	2.75	1.88	1.28
		3.11	1.60	0.46	0.33	0.38
Whitewater River, Middle Fork; trout stream portion	07040003-514	6.74	3.27	2.04	1.46	1.14
		0	0	0	0	0
		0	0	0	0	0
		0	0	0	0	0
		4.95	2.35	1.77	1.27	0.92
		1.79	0.92	0.27	0.19	0.22
Whitewater River, North Fork; Unnamed Cr to Unnamed Cr (below Class 7)	07040003-553	3.49	1.61	1.09	0.84	0.52
		0	0	0	0	0
		0	0	0	0	0
		0	0	0	0	0
		2.61	1.27	1.00	0.61	0.39
		0.88	0.34	0.09	0.23	0.13

Impaired Reach	Pollution Source	TMDL Allocation (lb/day)				TMDL Allocation (lb/mo)			
		Baseline Zone (f-orig/mo)	Baseline Zone (f-orig/mo)	Baseline Zone (f-orig/mo)	Baseline Zone (f-orig/mo)	Baseline Zone (f-orig/mo)	Baseline Zone (f-orig/mo)	Baseline Zone (f-orig/mo)	Baseline Zone (f-orig/mo)
Whitewater River, North Fk; unnamed Cr to Mid Fk Whitewater	07040003-554	Total Monthly Loading Capacity	18.25	8.42	5.69	4.40	2.70		
		WLA – permitted WWTF	0.32	0.32	0.32	0.32	0.32		
		WLA – MS4 communities	0	0	0	0	0		
		WLA – Livestock Operations	0	0	0	0	0		
		WLA – “Straight Pipe” Septic Systems	0	0	0	0	0		
		LA	13.31	6.31	4.92	2.89	1.72		
		MOS	4.62	1.79	0.45	1.19	0.66		
Zumbro River, South Fk; Cascade Cr to Zumbro Lk	07040004-507	Total Monthly Loading Capacity	121.66	54.27	29.21	16.70	6.00		
		WLA – permitted WWTF	4.35	4.35	4.35	4.35	4.35		
		WLA – MS4 communities	10.68	3.76	2.23	0.67	0		
		WLA – Livestock Operations	0	0	0	0	0		
		WLA – “Straight Pipe” Septic Systems	0	0	0	0	0		
		LA	81.84	28.84	17.08	5.17	0		
		MOS	24.80	17.32	5.55	6.51	1.65		
Zumbro River; West Indian Cr to Mississippi R	07040004-501	Total Monthly Loading Capacity	383.01	187.37	106.91	73.11	48.69		
		WLA – permitted WWTF	5.62	5.62	5.62	5.62	5.62		
		WLA – MS4 communities	7.31	3.40	2.35	1.38	1.05		
		WLA – Livestock Operations	0	0	0	0	0		
		WLA – “Straight Pipe” Septic Systems	0	0	0	0	0		
		LA	262.72	122.09	84.54	49.57	37.92		
		MOS	107.36	56.26	14.40	16.54	4.10		
Zumbro River, South Fork; Silver Lk Dam to Cascade Cr	07040004-533	Total Monthly Loading Capacity	90.63	40.43	21.76	12.43	4.47		
		WLA – permitted WWTF	0	0	0	0	0		
		WLA – MS4 communities	5.74	2.19	1.40	0.60	0.20		
		WLA – Livestock Operations	0	0	0	0	0		
		WLA – “Straight Pipe” Septic Systems	0	0	0	0	0		
		LA	66.42	25.34	16.22	6.98	2.32		
		MOS	18.47	12.91	4.14	4.85	1.95		

Impaired Reach	Assessment Unit ID	TMDL/Allocations/MOS				
		High Flow Zone (0-0.07 mg/l)	Moist Flow Zone (1-0.07 mg/l)	Mid Flow Zone (1-0.07 mg/l)	Dry Flow Zone (1-0.07 mg/l)	Low Flow Zone (1-0.07 mg/l)
Zumbro River, South Fork; Bear Cr to Oakwood Dam	07040004-535	83.37	37.18	20.01	11.44	4.10
		0	0	0	0	0
	WLA - permitted WWTF	5.17	1.97	1.26	0.54	0.18
	WLA - MS4 communities	0	0	0	0	0
	WLA - Livestock Operations	0	0	0	0	0
	WLA - "Straight Pipe" Septic Systems	61.20	23.34	14.94	6.44	2.12
	LA	17.00	11.87	3.81	4.45	1.80
	MOS					
Zumbro River, South Fork; Salem Cr to Bear Cr	07040004-536	54.78	24.43	13.15	7.51	2.69
		0	0	0	0	0
	WLA - permitted WWTF	1.80	0.68	0.44	0.19	0.06
	WLA - MS4 communities	0	0	0	0	0
	WLA - Livestock Operations	0	0	0	0	0
	WLA - "Straight Pipe" Septic Systems	41.82	15.94	10.21	4.40	1.45
	LA	11.16	7.81	2.49	2.92	1.18
	MOS					
Zumbro River; Cold Cr to West Indian Cr	07040004-502	360.62	176.42	100.66	68.83	45.84
		5.61	5.61	5.61	5.61	5.61
	WLA - permitted WWTF	7.30	3.39	2.34	1.37	1.05
	WLA - MS4 communities	0	0	0	0	0
	WLA - Livestock Operations	0	0	0	0	0
	WLA - "Straight Pipe" Septic Systems	246.63	114.46	79.15	46.27	35.33
	LA	101.09	52.97	13.56	15.58	3.86
	MOS					

1 On the 2004 Integrate Report this impaired reach, Logan Branch, End trout stream portion to North Fk Whitewater R, is identified as assessment unit 07040003-552. However, on the draft 2006 Integrated Report which has been submitted to U.S. EPA for review and approval this impaired reach is identified with assessment unit 07040003-536. The Revised TMDL uses the draft 2006 IR assessment unit identification for this reach.

2 Information in this table can be found in Tables 5.21A through 5.59A in the Revised TMDL.

3 Information contained in this table can be found in Tables 5.21B through 5.59B in the Revised TMDL.

4 Information contained in this table can be found in Tables 5.21D through 5.59D in the Revised TMDL.

5 Allocation = (flow contribution from source) x (200 org/100ml) see pages 29-30 in the Revised TMDL and the WLA section of the decision document