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

APR 23 2008

REPLY TO THE ATTENTION OF:

WW-16J

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APR 30 2008

MPCA COMMISSIONERS OFFICE

Brad Moore, Commissioner
Minnesota Pollution Control Agency
520 Lafayette Road North
St. Paul, Minnesota 55155-4194

Dear Mr. Moore:

The United States Environmental Protection Agency has conducted a complete review of the final Total Maximum Daily Loads (TMDLs) for the Rock River Basin, including supporting documentation and follow up information. The Rock River Basin is located in southwestern Minnesota and across the Iowa border and includes four counties: Nobles, Murray, Pipestone, and Rock. The basin includes three watersheds, the Rock River from Elk Creek to the Minnesota/Iowa border, Elk Creek from the headwaters to the Rock River, and the Rock River from Champepadan Creek to Elk Creek. The TMDLs were calculated for fecal coliform bacteria in one stream reach (10170204-501) and for Total Suspended Solids (TSS), to address turbidity, in three stream reaches located in Assessment Units (AUs) 10170204-501, -509, and -519. The TMDLs address the pathogen impairment of Recreational Use during the recreational season, and the turbidity impairment for a healthy community of fish and habitat.

These TMDLs meet the requirements of Section 303(d) of the Clean Water Act (CWA) and EPA's implementing regulations at 40 C.F.R. Part 130. Therefore, EPA hereby approves Minnesota's four TMDLs, covering three stream segments in three AUs in the Rock River Basin. The statutory and regulatory requirements, and EPA's review of Minnesota's compliance with each requirement, are described in the enclosed decision document.

We wish to acknowledge Minnesota's effort in submitting this TMDL, addressing recreational season use, and look forward to future TMDL submissions by the State of Minnesota. If you have any questions, please contact Mr. Kevin Pierard, Chief of the Watersheds and Wetlands Branch at 312-886-4448.

Sincerely yours,

Tinka G. Hyde
Acting Director, Water Division

cc: Kelli Daberkow, MPCA

Enclosure

wq-iw7-11g

TMDL: Rock River Watershed, Minnesota
Date:

DECISION DOCUMENT FOR THE APPROVAL OF THE ROCK RIVER BASIN, MINNESOTA, TMDL

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

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

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

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

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

(1) the spatial extent of the watershed in which the impaired waterbody is located;
(2) the assumed distribution of land use in the watershed (e.g., urban, forested, agriculture);
(3) population characteristics, wildlife resources, and other relevant information affecting the characterization of the pollutant of concern and its allocation to sources;

(4) present and future growth trends, if taken into consideration in preparing the TMDL (e.g., the TMDL could include the design capacity of a wastewater treatment facility); and (5) an explanation and analytical basis for expressing the TMDL through *surrogate measures*, if applicable. *Surrogate measures* are parameters such as percent fines and turbidity for sediment impairments; chlorophyll *a* and phosphorus loadings for excess algae; length of riparian buffer; or number of acres of best management practices.

Comment:

Location Description/Spatial Extent: The TMDL is submitted by the Minnesota Pollution Control Agency (MPCA), in conjunction with the Water Resources Center at Minnesota State University, Mankato. Section 2.1 of the TMDL states that the Rock River is located in southwestern Minnesota and flows southward to the Minnesota/Iowa border and into Iowa, and is a tributary of the Missouri River Basin. Nobles, Murray, Pipestone, and Rock Counties are included in these drainage areas. The basin includes three watersheds:

- Rock River Watershed (RRW) reach, from Elk Creek to the Minnesota/Iowa border, encompasses 355,625 acres, or 556 square miles;
- Elk Creek from the headwaters to the Rock River, is a 41,151 acre watershed; and
- Rock River, from Champepadan Creek to Elk Creek, drains 276,845 acres.

Land use: Section 2.1 of the TMDL states that the topography is gently rolling with occasional rock outcroppings. The land use is 95% agricultural. There are over 684 feedlot facilities, including dairy, beef, swine, and poultry, with swine the dominant livestock. Approximately 66% of the human population is in urban areas, with parts of 12 incorporated communities and 3 unincorporated communities in the watershed, with a total population in the impaired portion of the watershed reaching 10,942.

Problem Identification: Section 2.1 of the TMDL states that the waters are impaired for fecal coliform and turbidity. Section 3.1 states that the waters are classified Class 2B, which are to provide a healthy community of cool or warm water sport or commercial fish, and associated aquatic life, and their habitats. The segments are also impaired for aquatic recreational use of fishing, swimming, canoeing, including bathing.

Pollutant of Concern: The pollutant of concern is fecal coliform bacteria in one assessment reach, and turbidity in all three reaches, shown in Table 2.1 below, taken from the TMDL.

Table 2.1 - Impaired Stream Reaches

Stream Name	Description	Parameter	Year Listed	MPCA River Assessment ID
Rock River	Elk Creek to Minnesota/Iowa Border	Turbidity	2002	10170204-501
Rock River	Elk Creek to Minnesota/Iowa Border	Fecal Coliform	1994	10170204-501
Rock River	Champepadan Creek to Elk Creek	Turbidity	2006	10170204-509
Elk Creek	Headwaters to Rock River	Turbidity	2006	10170204-519

Source Identification: Section 4.0 of the TMDL describes both the point sources (PS) and nonpoint sources (NPS). There are no MS4 communities in the RRW. The point sources are:

- livestock requiring permits, including 684 feedlots, see Table 6.1 below taken from the TMDL;
- permitted WWTF, including bypasses and violations, see Table 6.7 (modified) below; and,
- an estimated 1,084 illegal "straight pipe" Individual Sewage Treatment Systems (ISTS) which are a major contributor to the impairment, especially during low flow, with approximately 72% allowing inadequately treated wastewater into the waterways (inventory methods vary widely). MPCA indicated that systems are illegal, pursuant to Minnesota Rules Chapter 7080.

Table 6.1 – Feedlots with NPDES Permits in the Rock River Watershed

Registration Number	Feedlot Name	County	Animal Number and Type	Animal Units
105-100160	Gary Rodrigue - Hoffman Site	Nobles	3,000 Swine - 55 lbs. or More	900
105-107749	Kyle Van Dyke Section 3	Nobles	950 Mature Dairy Cows	950
105-50001	Donald DeKam Farm - Sec 2	Nobles	4,000 Swine - 55 lbs. or More	1,225
105-50004	GPFF Inc - Whitetail Run	Nobles	3,282 Swine - 55 lbs. or More	1,313
105-50008	Verlyn DeKam Farm	Nobles	8,510 Swine - 55 lbs. or More	2,553
105-92736	Mark Knips Farm Sec 29	Nobles	3,440 Swine - 55 lbs. or More	1,142
105-92829	Rick Bullerman Farm - Sec 25	Nobles	3,200 Swine - 55 lbs. or More	960
105-92976	John & Joe Wieneke Farm - Sec 27	Nobles	1,250 Other Cattle	1,883
105-93047	Mark Knips Farm Sec 31	Nobles	1,491 Other Cattle	1,499
117-109160	Pig City	Pipestone	4,800 Swine - 55 lbs. or More	1,440
117-50001	Spronk Brothers III - Hollyhock	Pipestone	4,800 Swine - 55 lbs. or More	1,440
117-50005	Jeff & Debra Brockberg Farm	Pipestone	6,020 Swine - 55 lbs. or More	1,806
117-50013	New Horizon Farms - Hillview East	Pipestone	3,975 Swine - 55 lbs. or More	1,193
117-60142	East River Farms	Pipestone	6,000 Swine - 55 lbs. or More	1,920
117-85163	Todd Van Essen Farm	Pipestone	1,000 Other Cattle	820
117-85455	Leon Kracht Farm	Pipestone	3,300 Swine - 55 lbs. or More	990
117-85586	Ken Winsel Farm Sec 22	Pipestone	3,900 Swine - 55 lbs. or More	1,170
117-85608	Charla Hunter Farm - Sec 14	Pipestone	3,200 Swine - 55 lbs. or More	960
133-105980	G&A Farms Inc	Rock	3,300 Swine - 55 lbs. or More	990
133-109460	Overgaard Pork - Site 2	Rock	3,000 Swine - 55 lbs. or More	900
133-84234	Knutson Feedlots	Rock	3,500 Other Cattle	3,500
133-84246	Kracht Hill Farm	Rock	3,200 Swine - 55 lbs. or More	960
133-84257	Binford Farms Sec 4	Rock	2,100 Other Cattle	2,125
133-84820	Craig Stegenga Farm	Rock	4,800 Swine - 55 lbs. or More	1,580

Table 6.7 (Modified) Name and permit number for fecal coliform permitted WWTFs

Name/Location	Permit Number
Chandler	MN0039748
Edgerton	MNG580011
Hardwick	MN0039713
Holland	MN0021270
Leota	MN0063941
Luverne	MN0020141
Magnolia	MN0025712
Woodstock	MN0065200

The WWTFs are primarily located in the headwater portions of the watershed that flow into the impaired segment; Luverne is the only WWTF located in an impaired reach (Rock River from

Champepadan Creek to Elk Creek) in river assessment ID 10170204-509. Magnolia is the single WWTF in watershed ID 10170204-519 (Elk Creek). There are no WWTFs in the impaired segment between Elk Creek and the Iowa border, ID 10170204-501.

The nonpoint sources are:

- Livestock – the 2003 inventory shows 14,081 dairy animal units (AU), 44,559 AU beef, 89,110 AU swine, 2,515 AU chicken, 199 AU horse, and 758 AU sheep in the RRW;
- Overland runoff and open tile intakes - there are setbacks for surface applied manure and incorporated manure, but for incorporated manure near open intakes the setback is 0 feet;
- Macropores/preferential flow - field experiments indicate that macropore flow is the dominant transport pathway for fecal bacteria, and the bacteria may remain viable for several months;
- Pastureland – unfenced pastureland with cattle access poses the greatest risk of fecal coliform contamination, with 78% of pastureland found within 1000 feet of a waterway;
- Pets – considered only a minor contributor; and,
- Wildlife and natural background – normally not a major contributor.

Human impact (both PS and NPS) - Section 4.0 (4.1.1 – 4.1.5) of the TMDL describes the sources in more detail. Human population is a source via several pathways as stated above. Further, the unsewered and unincorporated communities include Ash Creek and Kanaranzi, and Trosky is incorporated but unsewered. Wastewater Treatment Facility (WWTF) bypass occurs in emergencies, with high discharge during heavy precipitation; MPCA records show only one bypass in the City of Woodstock from 2000 through 2006. MPCA records show 29 WWTF violations from 2000 through 2004 in the City of Hatfield; the City is in the process of designing a new system. Edgerton and Holland each have two violations over a five year period.

The other major and more significant source that impacts the basin is livestock. Section 4.2 of the TMDL states that 99% of the fecal material in the basin is from livestock, though all of it is not transported or delivered to the streams. The majority of livestock manure is used for fertilizer, with 26% of primarily beef manure remains on pasture lands (available for runoff), and 2% of livestock manure remains in feedlots or on stockpiles without runoff controls. Field application accounts for an estimated 71% of the fecal material available in the watershed.

Section 9.3 of the TMDL indicates that turbidity may be caused by internal processes, such as streambed load movement, bank slumping, and internal growth and decay from algae and other plants. MPCA determined that for this watershed, streambank erosion and upland soil loss are the primary sources of excess turbidity and occur during storm runoff, snowmelt, and higher flows. When TSS values were removed from the dataset that occurred during storms, many TSS values remained below target. The contribution of TSS to streambank erosion and upland soil loss is greater when there is a lack of crop cover in April, May, and June.

Priority Ranking: Section 1.2 of TMDL submittal states that the priority ranking is implicit in the TMDL schedule included in Minnesota's 303(d) list. This TMDL was scheduled to begin in

2006. The criteria for ranking include all or some of the following: impairment impacts on public health and aquatic life; public value of the water; ability to complete the TMDL in an expedient manner, strong data, restorability, technical capability, local assistance, and sequencing within the watershed.

Surrogate measures: Transparency and total suspended solids (TSS) may be used as a surrogate for turbidity.

EPA finds that the TMDL document submitted by MPCA satisfies all requirements concerning this first 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)). EPA needs this information to review the loading capacity determination, and load and wasteload allocations, which are required by regulation.

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

Comment:

Designated Uses: Section 7.2 of the TMDL submittal states that the RRW segments are designated Class 2B; Minnesota Rules Chapter 7050 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.

Fecal coliform standard - between April 1 and October 31:

- **not to exceed 200 organisms/ 100ml geometric mean** of not less than five samples in any given calendar month for the "chronic" standard; and,

- **nor shall more than 10%** of all samples taken during any calendar month individually **exceed 2000 organisms/ 100ml** for the "acute" standard.

Turbidity standard – Class 2B streams have a **turbidity standard of 25 NTU** (Nephelometric Turbidity Unit), found in MN Rules Chapter 7050.0220. The chapter states: "The numerical and narrative water quality standards in parts 7050.0221 to 7050.0227 prescribe the qualities or properties of the waters of the state that are necessary for the designated public uses and benefits. If the standards in this part are exceeded, it is considered indicative of a polluted condition which is actually or potentially deleterious, harmful, or injurious with respect to designated uses or established classes of the waters of the state."

The target for fecal coliform is the standard as stated above and in Section 3.11, TMDL Endpoints, considered both chronic and acute standards, respectively. Neither the monthly or daily loading capacities (nor individual allocations) may be exceeded.

The target for turbidity is the standard as stated above, and found in Section 7.3 of the TMDL. **A target of 74mg/l TSS** was selected as a surrogate for turbidity; the method is further explained in Section 3 below. The target value is comparable to the 58 and 66 mg/l targets previously determined for the Western Corn Belt Plains Ecoregion and Northern Glaciated Plains Ecoregion, respectively. Most of the Rock River watershed is located in the Northern Glaciated Plains Ecoregion.

EPA finds that the TMDL document submitted by MPCA satisfies all requirements concerning this second element.

3. Loading Capacity - Linking Water Quality and Pollutant Sources

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

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

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

TMDLs must take into account *critical conditions* for steam flow, loading, and water quality parameters as part of the analysis of loading capacity. (40 C.F.R. §130.7(c)(1)). TMDLs should define applicable *critical conditions* and describe their approach to estimating both point and nonpoint source loadings under such *critical conditions*. In particular, the TMDL should discuss the approach used to compute and allocate nonpoint source loadings, e.g., meteorological conditions and land use distribution.

Comment:

TMDL = Loading Capacity (LC) = WLA + LA + MOS
The loading capacity for the impaired waterbody (Elk Creek to Iowa border) is the water quality standard for fecal coliform multiplied by flow; that is, a monthly geometric mean shall be below 200 org/100 ml (of not less than 5 samples in any given calendar month), nor shall more than 10% of all samples taken during any calendar month individually exceed 2000 organisms/ 100ml, multiplied by flow, and then a series of mathematical conversions (# 4 below). Thus, the values in the allocation tables (Tables 6.6 and 8.8 in the TMDL) are converted to the final loading capacities (found in Tables 6.8 and 8.11a, b, and c). Tables 6.9 a and 6.9b below are a compilation of the loading capacities.

Table 6.9a loading capacity for fecal coliform (t-org/day)

Flow regime	**High**	**moist**	**mid**	**dry**	**low**
Fecal coliform (t-org/day)	43.60	18.49	8.63	5.13	1.88

Table 6.9b loading capacity for TSS (tons/day)

Flow regime & location	**High**	**moist**	**mid**	**dry**	**low**
Elk Creek to Iowa border	173.05	62.71	25.67	12.97	6.35
Champepadan to Elk Cr.	134.71	48.82	19.98	10.09	4.94
Elk Cr. Hdwtr. to Rock River	20.02	7.26	2.97	1.50	0.73

Method for cause and effect: Section 6.0 of the TMDL reviews the load duration curve (LDC) methodology that was used in this TMDL.

1. The flow monitoring data came from the Rock River gaging station (#06483000). The data reflect a range of natural occurrences from extremely high flows to extremely low flows. Monthly mean flow values were obtained for April through October from 1995 through 2006 to correspond with the fecal coliform standard. These values were sorted by volume and a flow duration curve was developed.

2. From flow and water quality data, fecal coliform loads were calculated for five flow regimes under high flow, moist, mid-range, dry, and low flow conditions. The mid-range flow value for each flow regime was used to calculate the total monthly loading capacity (TMLC), using continuous flow data converted to monthly mean flow for the recreational season months and the fecal coliform standard of April through October. The values used for calculation are shown in Table 6.3 and 6.5 of the TMDL submittal.

3. Several conversion factors were used to determine the loading capacity per month for each flow regime. The capacity, in organisms/month, is calculated from volume, concentration, time, and flow conversion factors. The series of conversions are found in Section 6.5 of the TMDL.

4. The computation is for the USGS site at Luverne and represents only 75 percent of the drainage area of the impaired reach. To determine the loading capacity of the impaired reach a conversion factor of 1.33 was applied to the TMLC, TMDL and MOS from Table 6.6. This conversion factor is used to calculate the expected flow values at the impaired stream reach based on the additional drainage area.

5. The conversion from monthly load to daily load is shown below, derived by simply dividing trillion organisms/month by 30, resulting in trillion organisms/day.

Section 8.3 of the TMDL used the same duration curve approach and the same gaging site for turbidity as the fecal coliform data. Unlike the fecal coliform duration curve which used monthly mean flow values, turbidity TMDL duration curves require daily mean flow values, again from 1995 through 2006.

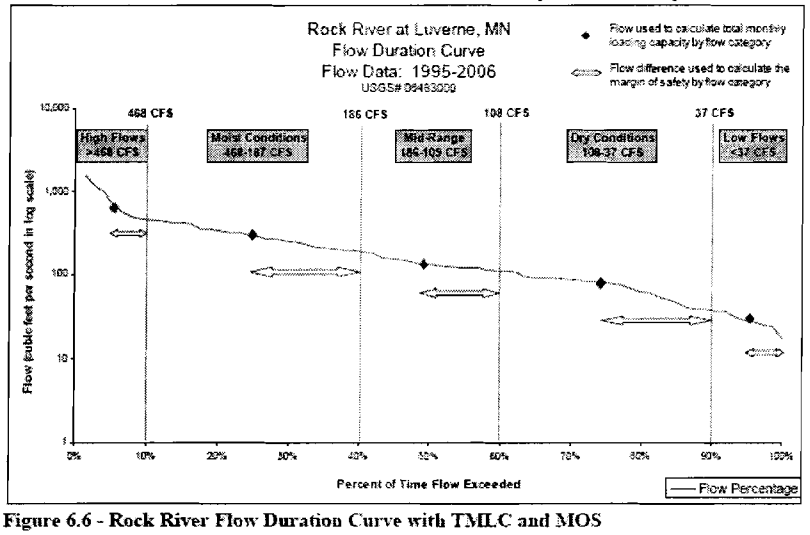

Figure 6.6 - Rock River Flow Duration Curve with TMLC and MOS

To develop the surrogate relationship of the turbidity standard of 25 NTU and TSS, paired turbidity and TSS samples collected from the Minnesota/Iowa monitoring station (STORET ID S000-097) were compiled using data from 1962-2006. The paired samples had to meet several criteria set forth by the MPCA, resulting in a total of 68 paired turbidity/TSS samples that met these criteria. A regression analysis was completed as shown in Figure 8.5 taken from the TMDL, as shown below. Using the regression line equation, a TSS concentration of 74 mg/l was determined to be the surrogate value to the 25 NTU turbidity standard.

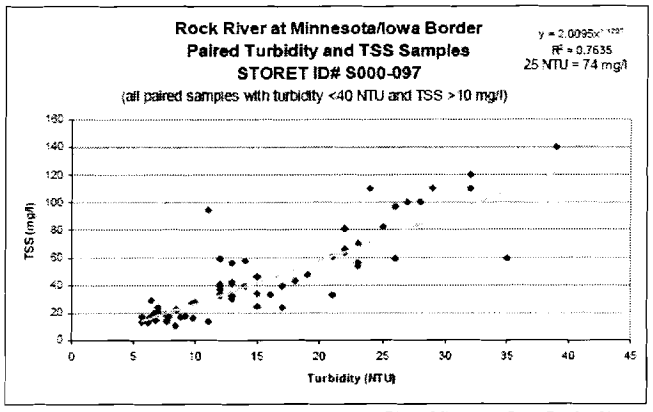

Figure 8.5 – Paired Turbidity/TSS Samples at the Rock River, Minnesota/Iowa Border Site

Critical Conditions: The Executive Summary states that the fecal coliform values are at the highest levels in August and September, and during storm runoff. For turbidity levels, high flows are also the critical condition with greatest reduction needed when both overland flow and in-channel erosion is greatest. The TMDL accounts for the critical condition because the load duration curves account for all flow conditions.

EPA finds that the TMDL document submitted by MPCA satisfies all requirements concerning this third element.

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:

Load Allocation Fecal Coliform: Table 6.8 on the following page is taken from the TMDL and shows both the load and wasteload allocations for fecal coliform. Overall, the greatest reduction from nonpoint sources ranges from 43 - 81 %, comparatively much larger than the reduction required for the WLA (0 – 11%).

Load Allocation TSS: Overall, the greatest reduction from nonpoint sources ranges from 22 - 65% for Elk Creek to the Iowa border (Table 8.11a on the following page), with least reduction needed under the lowest flow conditions in all three stream segments. A 18 - 65% reduction is required for Champedadan Creek to Elk Creek (Table 8.11b), and a 24 - 65% reduction is necessary at the headwaters of Elk Creek to the Rock River (Table 8.11c).

Table 6.8 - Monthly/Daily FC Loading Capacities and Allocations for the Rock River

Drainage Area (square miles): 556 Total WWTF Design Flow (mgd): 2.82	Flow Zone									
	High		Moist		Mid		Dry		Low	
	Monthly	Daily	Monthly	Daily	Monthly	Daily	Monthly	Daily	Monthly	Daily
	values expressed as trillion organisms per month/day									
TOTAL MONTHLY/DAILY LOADING CAPACITY	130.80	43.60	55.48	18.49	25.89	8.63	15.38	5.13	5.64	1.88
Wasteload Allocation										
Permitted Wastewater Treatment Facilities	0.63	0.21	0.63	0.21	0.63	0.21	0.63	0.21	0.63	0.21
Livestock Facilities Requiring NPDES Permits	0	0	0	0	0	0	0	0	0	0
"Straight Pipe" Septic Systems	0	0	0	0	0	0	0	0	0	0
Load Allocation	90.54	30.18	35.77	11.92	20.84	6.95	6.57	2.19	2.69	0.90
Margin of Safety	39.63	13.21	19.08	6.36	4.42	1.47	8.18	2.73	2.32	0.77
	values expressed as percent of total monthly/daily loading capacity									
TOTAL MONTHLY/DAILY LOADING CAPACITY	100%		100%		100%		100%		100%	
Wasteload Allocation										
Permitted Wastewater Treatment Facilities	0.5%		1.1%		2.4%		4.1%		11.2%	
Livestock Facilities Requiring NPDES Permits	0.0%		0.0%		0.0%		0.0%		0.0%	
"Straight Pipe" Septic Systems	0.0%		0.0%		0.0%		0.0%		0.0%	
Load Allocation	69.2%		64.5%		80.5%		42.7%		47.7%	
Margin of Safety	30.3%		34.4%		17.1%		53.2%		41.1%	

Table 8.11a – Total Daily Loading Capacities and Allocations – Rock River: Elk Creek to Minnesota/Iowa Border

Rock River: Elk Creek to Minnesota/Iowa Border AU ID: 10170204-501 Watershed Area: 355,625 acres / 556 sq. mi.	Flow Zone				
	High Flows	Moist Conditions	Mid-Range Flows	Dry Conditions	Low Flows
	values expressed as tons TSS/day				
Total Daily Loading Capacity	173.05	62.71	25.67	12.97	6.35
Wasteload Allocation					
Wastewater Treatment Facilities and Industrial Facilities with Numeric Discharge Limits for TSS (NPDES)	1.76	1.76	1.76	1.76	1.76
Construction Stormwater (NPDES)	1.14	0.37	0.17	0.07	0.01
Industrial Stormwater (NPDES)	0.57	0.18	0.09	0.03	0.01
Wasteload Allocation Total	3.46	2.31	2.02	1.86	1.78
Load Allocation	111.91	36.32	16.77	6.61	1.39
MOS	57.68	24.08	6.88	4.50	3.18
	value expressed as percentage of total daily loading capacity				
Total Daily Loading Capacity	100%	100%	100%	100%	100%
Wasteload Allocation					
Wastewater Treatment Facilities and Industrial Facilities with Numeric Discharge Limits for TSS (NPDES)	1.02%	2.81%	6.86%	13.57%	27.72%
Construction Stormwater (NPDES)	0.66%	0.59%	0.66%	0.52%	0.22%
Industrial Stormwater (NPDES)	0.33%	0.29%	0.33%	0.26%	0.11%
Wasteload Allocation Total	2.00%	3.69%	7.85%	14.35%	28.05%
Load Allocation	64.67%	57.91%	65.35%	50.96%	21.87%
MOS	33.33%	38.40%	26.80%	34.70%	50.08%

Table 8.11b – Total Daily Loading Capacities and Allocations – Rock River: Champedadan Creek to Elk Creek

Rock River: Champepadan Creek to Elk Creek AU ID: 10170204-509 Watershed Area: 276,845 acres / 433 sq. mi.	Flow Zone High Flows	Moist Conditions	Mid-Range Flows	Dry Conditions	Low Flows
	values expressed as tons TSS/day				
Total Daily Loading Capacity	134.71	48.82	19.98	10.09	4.94
Wasteload Allocation					
Wastewater Treatment Facilities and Industrial Facilities with Numeric Discharge Limits for TSS (NPDES)	1.56	1.56	1.56	1.56	1.56
Construction Stormwater (NPDES)	0.88	0.29	0.13	0.05	0.01
Industrial Stormwater (NPDES)	0.44	0.14	0.07	0.03	0.00
Wasteload Allocation Total	2.88	1.99	1.76	1.64	1.57
Load Allocation	86.93	28.09	12.86	4.95	0.90
MOS	44.90	18.74	5.36	3.50	2.47
	value expressed as percentage of total daily loading capacity				
Total Daily Loading Capacity	100%	100%	100%	100%	100%
Wasteload Allocation					
Wastewater Treatment Facilities and Industrial Facilities with Numeric Discharge Limits for TSS (NPDES)	1.16%	3.20%	7.81%	15.46%	31.58%
Construction Stormwater (NPDES)	0.66%	0.58%	0.65%	0.50%	0.18%
Industrial Stormwater (NPDES)	0.33%	0.29%	0.33%	0.25%	0.09%
Wasteload Allocation Total	2.14%	4.07%	8.79%	16.21%	31.86%
Load Allocation	64.53%	57.54%	64.38%	49.10%	18.14%
MOS	33.33%	38.39%	26.83%	34.69%	50.00%

Table 8.11c – Total Daily Loading Capacities and Allocations – Elk Creek: Headwaters to Rock River

Elk Creek: Headwaters to Rock River AU ID: 10170204-519 Watershed Area: 41,151 acres / 64 sq. mi.	Flow Zone High Flows	Moist Conditions	Mid-Range Flows	Dry Conditions	Low Flows
	values expressed as tons TSS/day				
Total Daily Loading Capacity	20.02	7.26	2.97	1.50	0.73
Wasteload Allocation					
Wastewater Treatment Facilities and Industrial Facilities with Numeric Discharge Limits for TSS (NPDES)	0.18	0.18	0.18	0.18	0.18
Construction Stormwater (NPDES)	0.13	0.04	0.02	0.01	0.00
Industrial Stormwater (NPDES)	0.07	0.02	0.01	0.00	0.00
Wasteload Allocation Total	0.38	0.24	0.21	0.19	0.18
Load Allocation	12.97	4.23	1.96	0.79	0.18
MOS	6.67	2.79	0.80	0.52	0.37
	value expressed as percentage of total daily loading capacity				
Total Daily Loading Capacity	100%	100%	100%	100%	100%
Wasteload Allocation					
Wastewater Treatment Facilities and Industrial Facilities with Numeric Discharge Limits for TSS (NPDES)	0.90%	2.48%	6.06%	12.00%	24.66%
Construction Stormwater (NPDES)	0.66%	0.59%	0.67%	0.53%	0.25%
Industrial Stormwater (NPDES)	0.33%	0.30%	0.34%	0.27%	0.12%
Wasteload Allocation Total	1.89%	3.37%	7.07%	12.80%	25.03%
Load Allocation	64.80%	58.20%	66.00%	52.53%	24.29%
MOS	33.32%	38.43%	26.94%	34.67%	50.68%

EPA finds that the TMDL document submitted by MPCA satisfies all requirements concerning this fourth element.

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 permitees 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:

Wasteload Allocation (WLA) for Fecal Coliform - Individual WLAs are shown below in Table 6.7 taken from the TMDL for Wastewater Treatment Facilities (WWTFs). The WLA are for all flow regimes. The total WLA in this table is reflected in the previous Table 6.8 given in both monthly (0.63t-orgs./mo) and daily (0.21t-org./day) values. The WWTFs are located in river assessment ID10170204-509, with one exception; Magnolia is in 10170204-519.

Table 6.7 - Wasteload Allocation for Rock River WWTFs

Name/Location	Permit Number	Design Flow (mgd)	WLA (t-orgs./mo.)
Chandler	MN0039748	0.16	0.037
Edgerton	MNG580011	0.37	0.083
Hardwick	MN0039713	0.15	0.035
Holland	MN0021270	0.10	0.022
Leota	MN0063941	0.16	0.037
Luverne	MN0020141	1.50	0.341
Magnolia	MN0025712	0.26	0.058
Woodstock	MN0065200	0.09	0.021
Totals		**2.79**	**0.63**

Wasteload Allocation (WLA) for TSS - Overall, the wasteload reduction is comparatively small at high flows (2% for all three segments) and increases at low flows (25% - 32% reductions for all three segments). The WLA are derived from three sources: WWTFs/an industrial NPDES facility, construction stormwater permits, and industrial stormwater permits. There are no MS4 permits within the limits of the watershed.

1) WWTFs/industrial WLA are below in Table 8.10 from the TMDL. Agri-Energy is the only industry in the TMDL study area that has a NPDES permit; it is included in the total WLA (1.76 tons TSS/day) in 8.11a along with all WWTFs. The WLA in Table 8.11b (1.56 tons TSS/day) includes all the facilities except for the Magnolia WWTF, which does not discharge to this portion of the watershed. The WLA in Table 8.11c (0.18 tons TSS/day) represents only the Magnolia WWTF, the single facility discharging into that watershed (Elk Creek).
2) Construction Stormwater permittees in almost all cases require less than 1% total reduction, but are included in the WLA. There are fourteen construction stormwater permits within the watershed.
3) Industrial Stormwater permittees in almost all cases require less than 1% total reduction, but are included in the WLA. There are five industrial stormwater permits within the watershed.

Table 8.10 – Wastewater Treatment Facilities and Industrial Facilities with Numeric Discharge Limits for TSS

Name	Permit Number	Wasteload Allocation (Tons Per Day TSS)	Wasteload Allocation, with Reserve Capacity (Tons Per Day TSS)
Chandler	MN0039748	0.3939	0.5908
Edgerton	MNG580011	0.1773	0.2659
Hardwick	MN0039713	0.0748	0.1122
Holland	MN0021270	0.0157	0.0236
Leota	MN0063941	0.0787	0.1181
Luverne	MN0020141	0.2510	0.3765
Magnolia	MN0025712	0.1233	0.1850
Woodstock	MN0065200	0.0433	0.0650
Agri-Energy	MN0065033	0.0101	0.0151
Totals		**1.1681**	**1.7521**

EPA finds that the TMDL document submitted by MPCA satisfies all requirements concerning this fifth element.

6. Margin of Safety (MOS)

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

Comment:

The MOS shown on the following page in Tables 9a and 9b is a compilation of tables in the TMDL. The MOS is the difference between the median flow and minimum flow in each of the flow zones discussed in Section 6.6 of the TMDL, and shown in the previous Figure 6.6 in this document. For example, the MOS for the high flow zone is the 95th percentile flow value subtracted from the 100th percentile flow value (the entire flow zone is from 100th percentile to the 90th). The resulting value was converted to a load and used as the MOS. The methodology was repeated in each of the remaining four flow zones the results are below and in previous TMDL tables in this document.

Table 9a. MOS fecal coliform (t-org/day)

Flow regime	High	moist	mid	dry	low
Fecal coliform (t-org/day)	9.96	4.79	1.11	2.05	0.58

Table 9b. MOS TSS (tons/day)

Flow regime & location	High	moist	mid	dry	low
Elk Creek to Iowa border	57.68	24.08	6.88	4.50	3.18
Champepadan to Elk Cr.	44.90	18.74	5.36	3.50	2.47
Elk Cr. Hdwtr. to Rock River	6.67	2.79	0.80	0.52	0.37

EPA finds that the TMDL document submitted by MPCA contains an appropriate MOS satisfying all requirements concerning this sixth 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)).

Comment:
Seasonal variation was considered in this TMDL as described in Section 9.0 of the TMDL. There are five distinct flow regimes that were used for the development of the allocations, from near drought to near flood conditions. Reductions vary, based on these flow regimes that occur at all times of the year. The stream conditions were further studied by examining the relationship of TSS to both flow conditions and seasonality, in Section 9.3 of the TMDL. It was determined that flow is more important than seasonality in increasing the influx of TSS into the river system during times of high and mid-range flow.

EPA finds that the TMDL document submitted by MPCA satisfies all requirements concerning this seventh element.

8. Reasonable Assurances

When a TMDL is developed for waters impaired by point sources only, the issuance of a National Pollutant Discharge Elimination System (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 TMDL reviews several methods of implementation for reduction of pathogen and sediment transport. The reasonable assurance in Section 12.0 of the TMDL states that implementation can take place via several funding mechanisms. The Environmental Quality Incentive program (EQIP) has funding for feedlot assistance with runoff problems, and State Cost Share Funding thru the Board of Soil and Water Resources (BSWR). The Soil and Water Conservation Districts have low interest loans for fixing problem home sewer systems. The TMDL has similar objectives for reductions outlined in Murray, Nobles, Pipestone and Rock County Water Plans. Impairments and improvements will also be monitored.

EPA finds that this criterion has been adequately addressed.

9. Monitoring Plan to Track TMDL Effectiveness

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

the load reductions provided for in the TMDL are occurring and leading to attainment of water quality standards.

Comment:

Section 10 of the TMDL states that monitoring will be implemented by MPCA and four counties. There is long term monitoring in the Rock River at the Iowa/Minnesota border, as part of the Milestone Monitoring Program, next occurring in 2009. There is also a monitoring partnership between Luverne, Rock County, and Rock County Rural Water System at five locations along the Rock River.

EPA finds that this criterion has been adequately addressed.

10. Implementation

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

Comment:

Section 11.0 of the TMDL has many suggestions for implementation:

- feedlot runoff reduction – there are funding mechanisms for reduction of feedlot runoff, including manure storage basins, gutters, diversions, and filter strips;
- manure management planning – education on crop nutrients, manure, rate of application, record keeping and manure application rotation;
- non-conforming septic systems – and estimated 72 percent individual household sewage treatment are out of compliance, monetary assistance is provided;
- pasture management – exclusion of livestock from streams and use of rotational grazing;
- vegetative practices – wetland restoration, filter strips, riparian buffers, and grassed waterways;
- structural practices – terraces, water and sediment control basins, diversions, and grade control structures.

EPA finds that this criterion has been adequately addressed.

11. Public Participation

EPA policy is that there should be full and meaningful public participation in the TMDL development process. The TMDL regulations require that each State/Tribe must subject calculations to establish TMDLs to public review consistent with its own continuing planning process (40 C.F.R. §130.7(c)(1)(ii)). In guidance, EPA has explained that final TMDLs submitted to EPA for review and approval should describe the State's/Tribe's public participation process, including a summary of significant comments and the State's/Tribe's responses to those comments. When EPA establishes a TMDL, EPA regulations require EPA to publish a notice seeking public comment (40 C.F.R. §130.7(d)(2)).

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

Comment:

Public outreach activities began at the onset of the project, and included a public open house, news releases, and a project newsletter. The technical committee was formed by staff from the City of Luverne, MDNR, MPCA, county planning and zoning, Soil and Water Conservation Districts, the Rock County Rural Water System, the Water Resources Center in Mankato, and US FWS. The TMDL was public noticed from December 31, 2007 to January 31, 2008. Copies of the draft TMDL were made available upon request and on the Internet web site:
http://www.pca.state.mn.us/publications/wq-iw7-11b.pdf
Public notice was given at: http://www.pca.state.mn.us/water/tmdl/tmdl-draft.html
Eight entities or individuals provided comments to the MPCA during the public comment period. The comments were adequately addressed by MPCA and are included as Appendix D of the TMDL. MPCA also adequately addressed U.S. EPA comments within the document.

EPA finds that the TMDL document submitted by MPCA satisfies all requirements concerning this eleventh element.

12. Submittal Letter

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

Comment:

The EPA received the final Rock River Watershed TMDL on March 27, 2008, accompanied by a submittal letter dated March 20, 2008. In the submittal letter, MPCA stated the submission includes the final TMDLs for fecal coliform bacteria and turbidity for the Rock River Watershed. (Assessment IDs are 10170204-501, -509, and -519 on Minnesota's 2006 303(d) list.) The locations are the Rock River Elk Creek to the Iowa border, Champepadan Creek to Elk Creek, and headwaters to Rock River, respectively. The Rock River Watershed is impaired for a healthy community of cool or warm water sport or commercial fish, aquatic life, and their habitat, by turbidity; and impaired by pathogens for recreational use and bathing.

EPA finds that the TMDL document submitted by MPCA satisfies all requirements concerning this twelfth element.

13. Conclusion

After a full and complete review, EPA finds that the TMDLs for the Rock River Watershed satisfy all of the elements of an approvable TMDL. This approval addresses 1 segment for fecal coliform and 3 segments for turbidity for a total of 4 TMDLs in the Assessment Unit ID reaches shown below.

EPA's approval of this TMDL does not extend to those waters that are within Indian Country, as defined in 18 U.S.C. Section 1151. EPA is taking no action to approve or disapprove TMDLs for those waters at this time. EPA, or eligible Indian Tribes, as appropriate, will retain responsibilities under the CWA Section 303(d) for those waters.

Stream Name	Description	MPCA Assessment Unit ID	Fecal coliform	TSS
Rock River	Elk Creek to border	10170204-501	x	x
Rock River	Champepadan Creek to Elk Creek	10170204-509		x
Elk Creek	Headwaters to Rock River	10170204-519		x