MINNESOTA POLLUTION CONTROL AGENCY

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July 20, 2020

David Haler
Watonwan County Land Management/SWCD
108 Eight Street, Suite 2
St. James MN 56081

Jill Sackett-Eberhart
Board Conservationist
11 Civic Center Plaza, Suite 300
Mankato, MN 56001

RE: Draft Watonwan River Comprehensive Watershed Management Plan

Dear David Haler and Jill Sackett-Eberhart,

The Minnesota Pollution Control Agency (MPCA) appreciates the opportunity to provide comments on the Watonwan River Watershed Draft Comprehensive Watershed Management Plan. Comments and concerns presented are related to the connections between the Watonwan Draft Plan and the Watonwan River Watershed Restoration and Protection Strategy (WRAPS) and Total Maximum Daily Load (TMDL) reports. The Watonwan River Comprehensive Watershed Management Plan should reflect the water quality and quantity issues as well as the goals addressed in the WRAPS and TMDL in order to prioritize implementation practices that address impairments in the watershed.

If you have any questions on the information provided, please contact Paul Davis at 507-344-5246.

Sincerely,

Wayne Cords

*This document has been electronically signed.*

Wayne Cords
Manager
South Section
Watershed Division

cc: Brooke Hacker, Clean Water Specialist, MN DNR
Katie Wigen, Hydrologist, MN DNR
Ed Lenz, Southern Region Manager, BWSR
Shaina Keseley, Clean Water Specialist, BWSR
Amanda Strommer, Planner, MDH
Jeff Berg, Water Policy Specialist, MDA
Paul Davis, Project Manager, MPCA

**Percent reductions used from the WRAPS report do not correlate well with PTMapp reductions.**

Section 6.2 of the plan indicates PTMapp was used to estimate existing pollutant loads and subsequent water quality conditions following conservation practice implementation.

> ***6.2 Planning Region Implementation Effort***
> *PTMapp estimates existing loads and water quality value arising from implementation of structural and management practices. These values are expressed as the annual mass load of sediment, total phosphorus (TP), or total nitrogen (TN) prior to, and following practice implementation. For purposes of this plan, existing loads and load reduction benefits are summarized at planning region outlets. However, load reduction benefits can be evaluated for any of the priority resource points within the WRW (Appendix M).*

Note: Appendix M is the hydrology analysis, Appendix L is the PTMapp methodology. Does the hydrology analysis address load reduction benefits or is this a typo?

While the percent load reductions used in the PTMapp analyses are consistent with the percent reductions called for in the WRAPS, the existing load estimates are very different in most cases. As shown in Table 5.3, PTMapp load estimates at the watershed outlet are lower than average measured loads for nitrogen and phosphorus by factors of more than eight and two, respectively. Likewise, PTMapp load estimates at the watershed outlet for sediment are greater than average measured loads by nearly a factor of two. Applying the same percentages to very different loading assumptions will result in very different load reduction goals. Therefore, it is not accurate for the plan to say the load reduction goals are consistent with the WRAPS as achieving the plan goals would not necessarily achieve reductions needed to meet water quality standards. This was not described well in the plan or during the process of developing the plan.

In addition, outlet loading at the sub-watershed planning areas (as estimated by PTMapp) are near or equal to the 10-year average (as measured by the MPCA Load Monitoring Network) loading at the outlet of the entire Watonwan River Watershed. MPCA understands that pollutant loading from the planning areas would not correlate exactly with loading at the outlet of the major watershed due to in-stream processes. However, applying reduction percentages to the planning area load estimates results in greater load reductions than would be realized at the mouth of the watershed. As an example, the PTMapp combined estimated loading from the six planning regions totals 172,590 tons of total suspended solids per year. With a short term reduction goal of 4% at the outlet of each planning region, the total load reduction at the mouth of the watershed would mathematically be 6,900 tons. A 6,900 ton reduction in sediment would actually equate to a 20% reduction when compared to the average measured load of 33,444 tons. The MPCA believes this represents an inflated reduction for what would be achieved from 4% reductions in each of the planning areas.

The MPCA recommends flows used in PTMapp are consistent with the Watonwan Hydrological Simulation Program-FORTRAN (HSPF) model and gaged stations in the Watonwan Watershed. The PTMapp: Theory and Development Documentation provided by HEI explains several ways in which flow and sediment loading can be “adjusted” to approximate flow information that is either measured or modeled via HSPF for each of the watersheds in the State of Minnesota. Options for adjusting loading from the document include:

***4.3.1.2 CATCHMENTS AND LOADING***

*The Catchments and Loading module allows the user to generate field scale (average size 40 acres) catchment for the entire plan boundary, process hydrologic travel times to catchment outlets and resources of concern, generate TP, TN, and sediment yield and loading, deliver TP, TN, and sediment yields and loads to catchment outlets and resources of concern, generate volumes and peak discharge for 2 year, 24 hour and 10 year, 24 hour events,* ***and import scaling data (HSPF, SWAT, or 1 gage).*** *The methods used in the Catchments and Loading Module are described in section 5.1 Catchments and loading.*

***4.3.1.3 RANKING***

*The Ranking module allows the user to calculate ranks (i.e. 0-100%) for the loading information generated in the Catchments and Loading Module.* ***This includes ranking the delivery of TP, TN, and sediment leaving the landscape, to catchment outlets, and resources of concern.*** *In addition, the Ranking Module allows the user to re-rank data based upon user provided zones (e.g. planning regions), adjust ranks developed by PTMApp by a user supplied weighting factor (e.g. zonation outputs, landowner willingness), and calculate a Water Quality Index (WQI). The methods used in the Ranking Module are described in section 5.2 Ranking.*

***5.1.4 SEDIMENT DELIVERY***

*The sediment transported downstream to a priority resource is further reduced using a first-order transport function. In-channel downstream transport and loss follows an exponential decay function (i.e., first order loss) using travel time and median diameter of sediment:*

$$SY = Ye^{-\{3T\beta d50}$$

*Where Y is sediment yield, β is transport coefficient, T is travel time, d50 is mean sediment diameter. Values of 0.2 and 0.1 are used as defaults for β and the d50, respectively.* ***These values can be adjusted based upon local knowledge.***

***5.1.8 ADJUSTING LOADS AND YIELDS***

***Two options for adjusting loads are available: adjusting to modeling data (e.g. Hydrologic Simulation Program-Fortran) and adjusting to point information (i.e. monitoring data).*** *Spatial information includes land segment information from watershed models (e.g. SWAT or HSPF) or other known sources (e.g. event mean concentrations (EMCs)) which have a spatial extent (e.g. PERLNDs from HSPF, HRUs from SWAT, NLCD for EMCs, etc).* ***Point information is observed loads at a gauging point the User would like to adjust the yields too.***

***5.2.1 PERCENTILE RANKS***

*For Sediment, TP, and TN data, percentile ranks are calculated based upon the relative magnitude of contribution towards leaving the landscape, reaching a catchment outlet, and reaching a priority resource.* ***Percentile ranks are calculated assuming a log-normal distribution, or linear distribution. PTMApp users will be able to choose which distribution is a better fit for their data.***

***5.2.2 WATER QUALITY INDEX***

*PTMApp, calculates a Water Quality Index (WQI) value that combines the sediment, TP and TN ranked rasters into one composite ranking computed as follows.*

*Water Quality Index (WQI)=0.5 x Sediment Rank + (0.25 x TN Rank + 0.25 x TP Rank)*

***By default, this formula gives equal weighting to both sediments and nutrients to identify areas contributing relatively high proportions of both sediment and nutrients downstream. Within PTMApp, these weightings can be adjusted based upon user preference.***

It doesn't appear that adjustment based on existing gages, HSPF or loading information was considered as part of the process in the Watonwan River Watershed. The MPCA recommends using this available information when applying PTMapp as it would correlate better with the WRAPS and TMDL loading and reduction goals designed to meet the water quality standards. Improved coordination between the consultant, planning group, and State agencies is needed to compile this information and provide the best data sets available.

## Feasibility and targeting information do not match.

Maps in Section 6, showing feasible locations of practices do not correlate well with maps showing targeted locations in the different planning areas. While feasibility maps show practices generally well distributed throughout the planning areas, the targeted maps indicate practices should be focused almost exclusively in the lowest third to lowest quarter of the watershed. This focus on the lowest reaches of the planning areas ignores all of the impaired waters and priority surface waters (as identified in the plan's maps) in the upper two thirds to three quarters of the sub-watersheds. The targeted maps also seem to identify areas that were not actually identified on the feasibility maps indicating a significant disconnect between feasibility and targeting. This could be a source of confusion for implementers trying to prioritize and target their work.

The MPCA believes water quality would benefit from adoption of management practices, such as conservation tillage, cover crops, and nutrient management, broadly across planning areas rather than focused on the lowest reaches. Perhaps these practices could be prioritized on sub-watersheds of impaired or other priority waters as a way to target. The MPCA also recommends providing resources and support to Soil and Water Conservations Districts to build landowner networks that can share successes and failures of management practices to increase interest and adoption.

The MPCA emphasizes that the load reductions adopted as part of the WRAPS 10-year strategies represented a load reduction in stream pollutant loads, not reductions in what is leaving a field. The MPCA agrees management and structural practices are critical to achieving short and long term water quality goals, but assuming a 1:1 ratio of pollution prevented from leaving a field to reduction of pollutant load in the stream is misleading. In other words, a practice that results in reduction of one ton of sediment leaving a field does not necessarily represent a one ton reduction in the stream. This 1:1 assumption as shown in the Section 6 graphs relating load reduction to cost, results in a vast underestimate of the cost required to achieve the ten-year water quality goals in the planning areas. For example, in the North Fork Watonwan planning region, the graph suggests that a relatively small investment of approximately $35,000 for management practices will achieve a 4% reduction (displayed as the 10-year goal) in sediment load. Another $50,000 spent on structural practices would double the load reduction to 8%. While it is valuable to display the landscape pollutant reductions that could be expected from spending implementation funds in the planning regions, the references to the instream load reduction goals should be removed from these graphics as there is not a direct 1:1 connection.

## Hydrology Report doesn't fit with needs for flow reduction.

It appears that Appendix M: Technical Memorandum was created to provide a volume calculation to base volume reduction goals and provide a method for accounting for practices implemented in the watershed. Using the limited information provided by the flow record of the Watonwan Watershed as the basis to understand historical and present hydrology does not provide a comprehensive understanding of all the issues including changes in precipitation, landuse, drainage, flow volume, and timing within the Watonwan Watershed. The DNR provides a much more in-depth review of watershed

hydrology and this information should be used in future projects to understand the connections of hydrology, geomorphology and biology in understanding the needs for implementation to improve stream habitat and improve the biological condition of watersheds. The MPCA would recommend utilization of the DNR information.

## Other concerns:

**Page 23.** What is the definition of a closed basin and does Lake Hanska fit the definition?

**Figure 3-11: Surface Water and Ditches in the Watonwan River Watershed.**

Is this a map of the open public ditches only? The whole drainage network should be included as part of this discussion. Leaving out the public tile systems and some estimation of the amount of private tile within the watershed doesn't give an accurate picture of the potential impacts that drainage has on the watershed and the extent of the drainage systems within the watershed. A significant amount of time was spent discussing drainage during planning meetings. There should be a better inventory of the network that's being considered.

**Section 3.7, Water Quality and Quantity.**

There is no discussion of TSS, TN or TP loading issues in the water quality section. A great deal of information on these pollutants is contained in the Watonwan WRAPS which could be easily summarized and included in this section.

**Section 3.8, Stormwater Systems, Drainage Systems, and Control Structures.**

Please consider changing the wording "The drainage network is defined by the Watonwan River…" to something more like the "The river network…" or the "The watershed network…". Drainage systems have their own connotation and this is expressed later in the paragraph as public and private systems.

**Resource Concern: River and Streams – Issue SW 3.2 Elevated bacteria levels in rivers and streams. Pages 87-88.**

Short and long term goals do not match the map information provided. Is there a calculation for each subwatershed that is being defined?

**Table 6-4: Cost – effectiveness investment guide for making progress towards waters quality goals.**

Why are management practices for nitrogen reduction so much more expensive than structural practices? Things like nutrient management should be a negative cost. Please explain this in the plan.

**Resource Concern: Aquatic Habitat – Issue HR 1.1: Aquatic and riparian habitat loss from development and flow variability. Pages 101-103.**

Bio impairments are more related to fish and invertebrate information and issues within the riparian zone. Table 5.7 Priority areas for wildlife habitat, seems to be out of place for the discussion of bio impaired stream reaches and managing the riparian zone.