MINNESOTA DEPARTMENT OF NATURAL RESOURCES
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August 10, 2016

Root River One Watershed, One Plan Planning and Policy Committees
C/O Donna Rasmussen
Fillmore County SWCD
900 Washington St. NW
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RE: Review and Comments for the Draft Root River Watershed, One Watershed, One Plan Report

The Minnesota Department of Natural Resources (DNR) appreciates the opportunity to review and comment on the Draft One Watershed, One Plan for the Root River Watershed dated May 25, 2016. We greatly appreciate the efforts of those who have participated in development of the plan. We will continue our involvement and support as we move into the implementation phase of the plan.

The Root River Watershed is one of the largest and most complex in Minnesota. The karst geology and topography throughout the watershed presents many challenges to addressing water quality impairments. Since the Root River is a tributary to the Mississippi River, this plan also has a role in reducing water quality impairments in the Mississippi River and hypoxia in the Gulf of Mexico.

A high level of coordination with state agencies, local units of government, and interest groups is critical to the success of the One Watershed, One Plan process. We wish to acknowledge the incorporation of DNR comments which were presented during plan development. Many departmental comments and concerns were addressed in this draft final report.

We offer the following observations and concerns which were not addressed in the final draft:

- An area of concern to the DNR is the application of the Prioritize, Target, and Measure Application (PTMApp). The apparent use of the 100K digital line graph leaves an unknown number of digital dams that result in a filled digital elevation model (DEM) for analysis. This can result in a modeled flow network that does not follow the true network. Questions we would like to see addressed are: What are the effects on the resultant flow network? How does this influence load reduction estimates at both the catchment and watershed level? Providing more transparency in this regard would increase our confidence in the PTMApp results and subsequent use in targeting best management practices (BMPs) in the watershed.

- Sediment fingerprinting techniques have been used to identify sediment sources and sinks within the Root River watershed (Stout et al. 2014) http://www.tandfonline.com/doi/abs/10.1080/00045608.2013.843434?journalCode=raag20. They found that most of the suspended sediment in the Root River originates from floodplains and terraces. The PTMApp does not model these sediment sources and may not account for the largest contributors to suspended sediment. Given this limitation, how is targeting of BMPs to reduce the sediment load from near channel sources being accomplished? Should a different tool such as the Hydrologic Simulation Program FORTRAN (HSPF) be used? The HSPF model was used by the Minnesota Pollution Control Agency (MPCA) to estimate sediment load reductions in the Root River Watershed Restoration and Protection Strategies report

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https://www.pca.state.mn.us/sites/default/files/wq-ws4-18a.pdf. Could results from this modeling effort be applied in the One Watershed, One Plan report?

- The flashy hydrology of the Root River system as well as the impacts of the large floods in 2007 and 2008 could be presented within the body of the report instead of in Appendix D (page 7). The infrastructure and environmental costs associated with these events could be used for funding justification. The causes of flashy hydrology and strategies to address it could also be discussed. Since a large proportion of the suspended sediment load originates from floodplains and terraces, strategies that decrease peak flows could be emphasized as a means of reducing the sediment and phosphorous load as well as protecting infrastructure.

- The issue of time lag between the time when BMPs are implemented and improvements in surface and ground water quality are first measured, is a very important aspect of watershed restoration. Improvements in water quality parameters may take decades to be observed in monitoring results https://www.epa.gov/sites/production/files/2016-05/documents/tech_notes_4_dec2013_lag.pdf. This length of time can exceed the monitoring period for watershed restoration plans. This can create the perception that changes made to land management and the dollars spent via a watershed management plan were unsuccessful at improving water quality, when in reality, the changes may be successful but not measured because the monitoring period was too short to account for the time lag. Rapid reductions in nutrient and bacteria loads can occur when BMPs are installed close to streams, such as fencing to exclude livestock. However, improvements in stream biota and associated biological indices often occur much more slowly. We suggest that the issue of time lag be addressed in this plan. It is an important aspect of water quality restoration that needs to be understood by participants in the watershed restoration planning process.

- Item 3.3.15 on page 2-7, lists the lack of fish species diversity representative of a healthy, multi-species complex as a potential issue facing trout streams. Coldwater streams typically have very few fish species and some of the best trout streams in the Root River watershed may have only two fish species present. This is accounted for in coldwater indices of biological integrity http://course1.winona.edu/nmundahl/hp/documents/MundahlandSimon1998.pdf
We suggest rewording this item to focus on stream temperature. Suggested wording is "*An increase in the number of fish species in a trout stream could indicate an increase in average stream temperature and should be investigated*". There are a variety of potential causes for elevated stream temperature including diminished spring flow. This also leads to the potential issue of changes in stream temperature due to climate change, which could also be presented in the plan.

- Table 2-1 on page 2-8 under item 3.5 the description of karst as "holes" in the surficial land should be revised. This is a description of a sinkhole which is just one aspect of the karst landscape. A karst landscape also has sinking streams, caves, and springs which develop from the dissolution of limestone by water. See https://www.pca.state.mn.us/water/karst-minnesota for information regarding the characteristics of a karst landscape.

- Table 2-1 on page 2-11 under resource concern 5.2, consider changing the heading from "Rural Environmental Health" to "Environmental Health and Agriculture". This would be more in line with the resource concern description as it is written. Protecting surface and ground water resources

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from contamination through installation of BMPs could be added to bring groundwater in as a resource concern from both environmental and human health standpoints.

- Table 2-1 page 2-11 under item 5.4.4 managing land use and development processes could include agricultural land as well as urban/developed land. For example, there are areas in the Root River watershed that are better suited to agricultural uses other than row crops due to slopes that are excessive. Yet these lands are planted in row crops annually and require constant diligence to keep soil erosion and runoff in check. Smart "development" should include smart agriculture as well.

- Regarding Figure 2.1 on page 2-15, we suggest removing well points where the nitrogen level was less than 6 mg/l. This would improve clarity of the figure.

- Section 2.6.1.4 on page 2-37 Improving soil health implies that soil health is degraded. This section would be improved by a discussion of current soil condition, mechanisms that degrade soil, and methods for improving soil health. However, current soil health information is not easily obtainable because it is time consuming to collect and may be limited to the scale of individual fields http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/assessment/. Perhaps pointing out the importance of this information and suggesting a larger emphasis on collecting soil health data could be added to the report.

- Section 3.2.1 under iii-Threatened Impairment Risk -c- on page 3-6 change "*naturalized*" to "*native*" Brook Trout.

- Strategy GW-2 on page 3-14 states "*Manage groundwater quality to achieve the* ***total coliform drinking*** *standard by maintaining appropriate bacterial loading in areas contributing to groundwater recharge*". The word "water" should be added after the word "drinking" where highlighted in bold above. Also regarding this strategy, what is an appropriate level of bacterial loading to groundwater recharge areas? What is the typical background level of bacteria in groundwater for the Root River watershed? Supportive information would improve this strategy.

- Action GW 2.7 on page 3-14 We suggest stronger wording of this action from "*use*" existing rules to "*enforce*" existing rules regarding siting of feedlots, animal confinement areas, and the application of manure.

- Action WI-6.1 on page 3-28 conflicts with item 3.3.17 on page 2-7 and actions SW-9.4 and SW-9.6 on page 3-20. The use of undersized culverts to hold back floodwaters is highly discouraged by the DNR. Undersized culverts cause water to impound and deposit sediment upstream and create vertical and lateral scour downstream due to increased water velocity through the culverts. This can lead to destabilization of the stream channel and stream bank erosion. Where undersized culverts already exist, floodplain culverts can be installed to alleviate pressure on road crossings and reduce impounding upstream. These damaging effects of undersized culverts can easily be seen in aerial photos of southeast Minnesota watersheds. Additionally, there are safety concerns associated with undersized culverts because the impounding effects can cause stress to road crossings. We suggest removing this action item entirely.

- Table 4-6 Action SW-8.3 page 4-31 what is meant by "public infrastructure" in this action? Does this refer to public drainage ditches, or roads and bridges? This isn't clear as stated. We suggest

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rewording this to “minimize damage to public, private, and agricultural lands” as this is more inclusive than protecting agricultural lands alone.

Finally, we believe the issue of the potential impacts of climate change on streamflow and groundwater recharge would be an important addition to this plan. A regional climate model for the Upper Mississippi River (UMR) basin http://onlinelibrary.wiley.com/doi/10.1029/2003JD003686/pdf predicts a 51% increase in surface runoff and a 43% increase in groundwater recharge on an annual basis by the 2040’s. This is mostly attributed to more intense rainfall events during summer onto soils that are at or near saturation. These potential changes in the hydrology of the UMR basin, including the Root River watershed, would have significant impacts on the effectiveness of water quality improvement strategies and actions.

For the next iteration of the plan, please consider dividing the watershed into lobes based upon the branches of the Root River or upon geology. There are great differences between the flatter terrain in the western portion of the watershed and the karst and blufflands to the east. Strategies and actions specific to each branch of the Root River could be developed which may reduce complexity of the plan and allow improved targeting of BMPs.

Thank you for consideration of our comments and concerns. The Root River One Watershed, One plan builds upon a long history of local water planning and successes within the Root River watershed. We look forward to working with you in the implementation phase of this plan.

Sincerely,

Keith Parker
DNR Central Region Director

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