



Minnesota Pollution Control Agency

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March 30, 2017

Ms. Ashley Gallagher
Dakota Soil and Water Conservation District
4100 - 220th Street West
Farmington MN 55024

RE: Response to request for priority concerns for the Cannon River Watershed
One Watershed, One Plan

Dear Ms. Gallagher:

The Minnesota Pollution Control Agency (MPCA) appreciates the opportunity to provide input at the outset of the One Water, One Plan (1W1P) process in the Cannon River Watershed (CRW). The MPCA has coordinated and funded many efforts in the CRW that will provide technical information, tools and strategies for use in 1W1P. A summary of select products is included as a preface to a listing of priority concerns. Others (e.g. Little Cannon SWAT model) are summarized on the MPCA's Cannon River web page: <https://www.pca.state.mn.us/water/watersheds/cannon-river>.

- **Revised Regional Total Maximum Daily Load Evaluation of Fecal Coliform Bacteria Impairments in the Lower Mississippi River Basin in Minnesota (2006).** This is a regional foundational work examining pathogens in surface waters of southeast Minnesota. <https://www.pca.state.mn.us/sites/default/files/wq-iw9-03b.pdf>. Implementation plan: <https://www.pca.state.mn.us/sites/default/files/wq-iw9-02c.pdf>.
- **Cannon River Watershed Management Strategy (2011).** In partnership with the MPCA and many local partners, the Cannon River Watershed Partnership (CRWP) developed the Cannon River Watershed Management Strategy. The strategy brought together information regarding the watershed's many lakes and rivers; it also surveyed the existing plans and priorities of local government units and state agencies to create an overarching strategy for the entire watershed. The strategy was submitted to the MPCA on June 30, 2011. <http://crwp.net/watershed-strategy/>. It includes an in-depth examination of trends in the watershed: <http://crwp.net/wp-content/uploads/2013/01/Signs-of-Progress.pdf>.
- **Geologic Controls on Groundwater and Surface Water Flow in Southeastern Minnesota and its Impact on Nitrate Concentrations in Streams (Minnesota Geological Survey, 2014).** This report summarizes the results of a Minnesota Geological Survey (MGS) investigation conducted for the MPCA designed to support watershed planning efforts in southeast Minnesota. Specifically it provides better understanding of the geologic controls on nitrate transport in the region, including nitrate in groundwater that is the source of baseflow to streams. <http://conservancy.umn.edu/handle/11299/162612>.
- **Cannon River Watershed Monitoring and Assessment Report (2014).** The assessment report summarizes results of intensive watershed monitoring. <https://www.pca.state.mn.us/sites/default/files/wq-ws3-0704002b.pdf>.
- **Cannon River Watershed Stressor Identification Report (2015).** The stressor identification report examines biota impairments in the context of probable causal factors (i.e. "stressors"). <https://www.pca.state.mn.us/sites/default/files/wq-ws5-07040002a.pdf>.

- **Cannon River Watershed HSPF Model Development Project (2015).** Hydrologic Simulation Program Fortran (HSPF) is a watershed model that can simulate land/runoff processes as well as in-stream dynamics. Management scenarios for both point and nonpoint pollution sources can be constructed; simulations then output resultant predicted water quality at approximately one hundred locations in the watershed. The built and calibrated model is available for use by the 1W1P and/or any contracted consultant. The Scenario Application Manager allows Local Government Units to use HSPF in a Windows/desktop environment.
<https://www.pca.state.mn.us/sites/default/files/wq-ws4-23d.pdf>. The first set of management scenario simulations are summarized in a memorandum:
<https://www.pca.state.mn.us/sites/default/files/wq-ws4-23c.pdf>
- **Cannon River Watershed Restoration and Protection Strategies Report (2016).** The Watershed Restoration and Protection Strategies (WRAPS) summarizes foundational technical information and stakeholder input to provide a starting point from which to develop tools that will help local governments, land owners, and special interest groups determine (1) the best strategies for making improvements and protecting resources that are already in good condition, and (2) focus those strategies in the best places to do work. The WRAPS includes goals, timelines, pollutant source information and management strategies distilled from statewide studies/strategies such as the Minnesota Nutrient Reduction Strategy (NRS) and Nitrogen in Minnesota Surface Waters.
<https://www.pca.state.mn.us/sites/default/files/wq-ws4-23a.pdf>
- **Cannon River Watershed Total Maximum Daily Load (2016).** The Total Maximum Daily Loads (TMDLs) in the CRW address thirty lake phosphorus impairments and forty-one stream reaches impaired for bacteria, chloride, nitrate and/or total suspended solids. Wasteload allocations will be used going forward to inform point source permits in the CRW. The TMDLs were approved on February 17, 2016; the document is companion to the WRAPS document.
<https://www.pca.state.mn.us/sites/default/files/wq-iw9-19e.pdf>.
- **Watershed Pollutant Load Monitoring Network (currently maintained website).** The Watershed Pollutant Load Monitoring Network measures and compares pollutant loads from Minnesota's rivers and streams and tracks water quality trends. A new data viewer allows for interactive examination and retrieval of load data, including sites in the CRW.
<https://www.pca.state.mn.us/water/watershed-pollutant-load-monitoring-network>.
- **Point source phosphorus mapping tool (currently maintained website).** This tool provides via interactive map interface summaries of annual phosphorus loads and flow volumes discharged from wastewater facilities since 2005. <https://www.pca.state.mn.us/water/phosphorus-loads-and-flow-volumes>.

According to the findings of these and other works, the MPCA lists the following priority concerns for consideration in the 1W1P process:

- **Nitrate-nitrogen reduction.** Nitrate contamination of surface and groundwater is a long-standing issue in southeastern Minnesota. Most county water plans rank this as a top priority concern. Minnesota's NRS documented an approximate 0 percent change in the nitrogen load leaving our state since the 1990s. In the karst region, many springs show increasing nitrate concentration trends. "Moving the needle" on nitrates will be a challenge going forward; one that should be addressed in the Cannon 1W1P. The WRAPS draws on various citations to describe sources (cultivated acres are dominant source), transport (nearly all nitrogen in the CRW is loaded to surface waters via vertical leaching loss) and the best strategies for nitrate

reduction (source control and vegetative scouring). It also provides stakeholder-derived example combinations of best management practices (BMPs) that (per best estimates) would result in a 20 percent reduction of the nitrogen load leaving the watershed. Nitrogen BMPs need broad application in our state and in the CRW. Because prioritization for nitrogen work in southeast Minnesota cannot be sufficiently accomplished via runoff-based Geographic Information System models, the 1W1P could consider a "layering" approach to prioritization: focus on areas that show high nitrate loading (per model), have drinking water issues (per Minnesota Department of Health and/or private well analysis) and show biota stressed by nitrate (per stressor identification). The 1W1P should also work to temper expectations regarding nitrate water quality changes in trout streams, given the lag-time in delivery from land through groundwater to surface waters (see MGS report listed above).

- **Improve and protect the watershed's lakes.** The CRW includes various lake types, most of which are enriched with phosphorus and as such do not meet water quality goals due to excessive and/or frequent algae blooms. Point source loads of phosphorus to the Byllesby Reservoir have been reduced significantly via permit requirements for Faribault, Northfield and Owatonna. Heiskary & Martin (work summarized in WRAPS) and LimnoTech, Inc. all used watershed and BATHTUB models to arrive at phosphorus budget estimates and examine potential sources and mechanisms for internal loading in the upper Cannon lakes. The 1W1P should forward efforts to better understand the nutrient budgets (i.e. watershed vs internal loads) of specific lakes, while more generally working to reduce phosphorus loading in the lakes region. Two lakes (Clear and Loon) and one reservoir (Byllesby) include permitted Municipal Separate Storm Sewer System (MS4) areas in their watersheds; 1W1P should work with state and local MS4 staff to consider strategies for these urban areas, particularly in the cases of Clear and Loon Lakes which include 40 percent and 93 percent MS4 area in their drainages (respectively). Five assessed lakes in the watershed are fully supporting recreational use (Kelly, Dudley, Fish, Roehmildts and Beaver). The 1W1P should solidify strategies (e.g. preserving perennial cover in the watersheds via easements or ordinance) to keep the quality of these lakes intact.
- **Further study and address habitat issues in streams.** Degraded and/or insufficient stream habitat is a prevalent stressor of biota (i.e. "fish and bugs") in southeast Minnesota and in the CRW (see WRAPS Appendix I for a list of 22 streams for which habitat is a conclusive stressor). The 1W1P should consider the best strategies for addressing habitat issues in various settings and at various scales. State monies are supporting natural channel design projects (strategy included in WRAPS Table 16; Little Cannon project listed in Table 12) and trout habitat improvement projects (e.g. grant dollars to Trout Unlimited for work on Rice Creek); some Soil and Water Conservation Boards are implementing low-cost projects that change channel geometry and seed banks with perennials. All are viable strategies; a thoughtful and technically supported approach to optimally applying these various habitat improvement methods would be a good outcome for 1W1P.
- **Protection of baseflow especially in Lower Cannon Trout Streams.** The distinctive landscape of the Driftless Area is characterized by craggy limestone, sandstone valleys, and steep hillsides. This ancient terrain, which was bypassed by the most recent glaciation, is characterized by one of the highest concentrations of limestone spring creeks in the world. The spring water emerging from limestone bedrock provides a near constant flow of cold water. The limestone enriches the water with essential minerals for aquatic insects and other creatures, which contributes to prime conditions for healthy populations of trout and other coldwater dependent

species. More than 600 spring creeks (exceeding 4,000 river miles) cross this 24,000 square-mile landscape. Trout anglers produce an economic benefit to the Driftless Area in excess of \$1.1 billion dollars every year (Northstar Economics & Trout Unlimited 2008). All of the designated trout waters in the Lower Cannon Watershed lobe meet the criteria for the southeast Minnesota coldwater Fish Index of Biotic Integrity (IBI). While there are restoration considerations in this lobe (e.g. high nitrates in the trout streams and poor macroinvertebrate IBIs in Trout Brook, a focus of protection work should be preserving the baseflow of streams via focused monitoring and careful consideration of future water appropriations.

- **Increase perennial land acreage.** More living cover on the land reduces pollutant loads and provides wildlife habitat. This is a multiple-benefits “parent” strategy from which various specific strategies could be shaped. Examples in the WRAPS document include:
 - Keep existing pastures and rangeland; look for opportunities to convert marginal row crop acres. Pasture is a working-lands BMP that is an integral part of local economies;
 - Encourage re-enrollment of expiring CRP contracts;
 - Manage forest acres with stewardship planning;
 - Keep the watersheds of the five remaining fully supporting lakes in perennial cover (i.e. no net loss of perennial cover);

The NRS and numerous other technical documents cite the multiple benefits of perennials. Chapter 8 of the 2011 CRW Strategy document describes a “green corridor” along the upper Cannon, noting the significant effort made to date that has resulted in acquisition of key parcels; this concept could be considered by 1W1P. The Cannon 1W1P is being composed concurrent to the buffer initiative roll-out and Minnesota’s most recent Conservation Reserve Enhancement Program (CREP) funding. The plan should provide foundation for efforts going forward to increase perennial acres in the watershed.

- **Continue work to reduce pathogens in surface waters.** The presence of fecal pathogens in surface water is a regional problem in southeast Minnesota. The issue was well-described in a stakeholder driven process that culminated in approval of 39 approved fecal coliform TMDLs for streams and rivers in the region. The Revised Regional *Total Maximum Daily Load Evaluation of Fecal Coliform Bacteria Impairments in the Lower Mississippi River Basin in Minnesota* was approved in 2006. Subsequent to TMDL approval, stakeholders completed an implementation plan. According to the findings and strategies summarized in these documents, numerous projects have been executed in efforts to reduce pathogen loading to the region’s surface waters. Feedlot runoff, unsewered communities and over-grazed pastures (among others) have all been addressed via grant funding. The E. coli TMDLs in the CRW should be considered (for planning purposes) an addendum to the regional TMDL work and 1W1P should support continued work to better understand E. coli indicator presence (see TMDLs document for research needs) and reduce pathogen loading to surface waters.

Sediment (and associated turbidity) is a pollutant of concern and a prevalent stressor of aquatic life in the CRW. It is implicitly addressed by the priority concerns listed above in that focusing on pollutant and pathogen load reductions and stream habitat issues will result in corresponding sediment load reductions.

Ms. Ashley Gallagher

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The MPCA is committed to providing assistance in interpreting and applying the substance of the WRAPS, NRS, HSPF model, Stressor Identification conclusions, etc. going forward as these and other priority concerns are installed and addressed in the 1W1P framework. Thank you again for the opportunity to provide input and for your on-going work in the CRW.

Sincerely,

A handwritten signature in black ink, appearing to read "Justin Watkins", with a long horizontal flourish extending to the right.

Justin Watkins

Pollution Control Specialist Senior

Rochester Office

Watershed Division

JW: jw

