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See attached file

For more than two decades Minnesota has been a leader in addressing water quality of receiving waters. An important part of this is the stormwater program, which implements the NPDES permitting program. MPCA's stormwater permits have been exemplary in addressing water quality issues related to managing stormwater runoff. This includes excellent and dedicated staff.

The draft construction stormwater (CSW) permit could be more aggressive in promoting green stormwater infrastructure (GSI) and environmental sustainability. This includes addressing climate resiliency, an important goal for the Agency. The permit can be modified in multiple ways to promote GSI through incentives rather than through restrictions. These are presented below.

Please note that I have not listed references in these comments. These can be provided upon request.

1. Section 16.7 specifies the water quality volume be calculated as an instantaneous volume. This restricts many practices that retain water and that potentially provide additional benefits, such as climate resiliency and habitat improvement. Examples include vegetated filter strips, disconnection systems, and urban tree canopy. These practices, when properly implemented and maintained, provide retention of stormwater runoff but do not meet the instantaneous volume requirement. Conversely, permittees may use swales without check dams (see for example the Minimal Impact Design Standards Calculator) to take credit toward meeting their permit, even though these practices also do not meet the instantaneous volume requirement. For this permit I am not recommending changes in the draft language. However, I strongly recommend the Agency consider modifying the next permit to account for these practices. I understand there are concerns about how these practices are built and maintained. However,

there are methods for addressing this that could either be written into the permit or specified in guidance. Examples include the following.

- a. Conservative infiltration values can be used for filter strips, or more preferred, specific vegetation can be promoted through permit language, such as establishing native perennial vegetation.
 - b. Most medium- and large-size cities have urban forestry programs, and many have tree preservation ordinances. The United States Forest Service is modifying its iTree model to account for the effect of trees on stormwater retention. Efforts such as these can be used to develop permit language that incentivizes urban tree canopy cover as a stormwater practice. In addition to stormwater benefits, trees provide other benefits consistent with Agency priorities, such as climate resiliency and social justice.
 - c. Some states in the east and northeast utilize impervious cover methods to meet water quality targets. Research supporting these impervious cover methods demonstrate that the quality of receiving waters is correlated with the amount of connected impervious surface in a contributing watershed. Similar approaches should be utilized in Minnesota, but under the current permit, disconnection of impervious surface may not meet the instantaneous volume requirement.
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2. Section 16.11 introduces a safety factor into field-measured infiltration rates. Again, I'm not suggesting changes to the draft permit language but strongly suggest the Agency re-examine this restriction. Field-measured values should be encouraged more aggressively. In addition, research conducted at Villanova University indicates most infiltration practices overperform.

This is because use of one-dimensional infiltration rates, as specified in the Minnesota Stormwater Manual for different soil types, does not represent actual flow conditions, which are three-dimensional. In addition, the long-term effects of vegetation, specifically native perennial vegetation, have been shown to restore and maintain infiltration rates in non-stormwater applications. There is insufficient research on this topic for stormwater practices, but it is likely to be an area of active research in the coming years.

3. Section 16.16 prohibits infiltration on soils with infiltration rates exceeding 8.3 inches per hour and disincentivizes field measurement of infiltration, which is contrary to the language in Section 16.11. There is no rationale established in MPCA guidance that supports this value. Restricting infiltration at higher rates presents an obstacle to maximizing retention, which is at odds with the concepts of GSI. In addition, multiple entities, such as the City of Minneapolis and Capitol Region Watershed District, have stormwater banking programs which allow a permittee to take credit for volume retention above the required water quality volume. This restriction in the CSW permit is not consistent with these efforts. The concern appears to be around the potential movement of pollutants to groundwater. This can easily be addressed by placing this restriction only on stormwater hotspots, as defined in the Minnesota Stormwater Manual. Or restrictions could be incorporated directly into the permit. Research, though limited, indicates that stormwater from non-hotspot locations typically does not exceed water quality standards.
4. Section 16.18 restricts infiltration on D soils. All soils can infiltrate to some extent. Why not encourage infiltration to the extent possible on any soil? What is a soil with an infiltration rate of 0.15 inches per hour, a C or D soil? Does capturing stormwater runoff in a cistern and then

irrigating an athletic field on a D soil violate this permit condition? Can practices with upturned elbows, which store water temporarily and slowly release it, be used to promote infiltration on D soils? Developers and practitioners fully understand the consequences of building a practice on D soils. Why not allow them the opportunity to infiltrate what they can? This can easily be supported with guidance in the Minnesota Stormwater Manual.

5. Section 17.6 does not clarify whether a permittee can take credit for volume reduction in practices with an underdrain. The Minimal Impact Design Standards Calculator can be used to calculate volume retention in these practices. Like the above comment on D soils, why not incentivize infiltration by specifying that retention credits can be taken for filtration practices?
 6. Sections 16.17, 17.9 and 17.10 specify a 3-foot separation distance from the seasonal high-water table. As far as I can tell, the 3-foot separation is based on septic system requirements. Considering just water quality, pollutant loading from septic drainfields is considerably higher than in most stormwater situations. The Minnesota Stormwater Manual indicates in systems with engineered media most of the pollutant attenuation occurs in the upper 6 inches. North Carolina, utilizing research conducted by Dr. William Hunt, one of the leading stormwater researchers in the country, employs a separation distance of two (2) feet. Again, I'm not recommending a change in the draft permit language, but strongly recommend the Agency look at this restriction and consider modifying it if appropriate.
 7. Section 11.11d specifies a relaxation of inspection for solar sites with perennial vegetation. This should apply to all sites under the permit, not just solar sites.
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In addition to the above comments, which focus on maximizing GSI, the permit should specify a recommended level of pretreatment, or at a minimum, provide guidance in the Minnesota Stormwater Manual and refer permittees to that guidance.
