

5.2 Stormwater Performance Standards and Policies

Current Policy and Procedures

In 2004, a report was completed by the UW–Madison Gaylord Nelson Institute for Environmental Studies entitled “Innovating Stormwater Management on the University of Wisconsin–Madison Campus.” Based on preliminary recommendations of that report, a resolution was introduced and was unanimously passed by the University Campus Planning Committee (CPC) on October 2, 2003 which in part stated the following:

“It is therefore recommend(ed) that the University of Wisconsin–Madison commit to a policy that ensures that the amount of runoff from newly developed and redeveloped areas be no greater than the amount that occurred under native conditions.”

The resolution also stated that “Implementation of this policy could be achieved by use of conservation practices on site, by improving stormwater management practices elsewhere on campus, or by a combination of on – and off-site improvements.”

This was a bold and forward thinking policy which represents the university’s goal of minimizing the campus’ adverse impacts on the natural environment and to become an ever more sustainable community. This recommended policy has been the stated goal for each new building project since the resolution was passed. However, the specific mechanics of implementing and achieving the policy have never been identified. Therefore, each new building design project team has needed to individually investigate the feasibility of meeting that recommended policy and each project has also shown that matching the amount of site runoff to native conditions is not feasible due to a number of factors including the lack of available open space suitable for stormwater management, the UW–Madison’s high demand on developable land for buildings and infrastructure, the poor infiltration capacity of soils on campus, and the need to avoid infiltrating polluted runoff.

Also, UW–Madison has not had the authority to transfer project funds into a separate escrow account for future use in constructing off-site stormwater

BMPs elsewhere on campus and this concept cannot currently be otherwise administratively and logistically implemented. As part of this plan, it is recommended that UW–Madison investigate creating a fee-in-lieu system that would allow individual project sponsors to mitigate their stormwater management impacts by paying into a fund that would go towards implementation of larger green infrastructure improvements. The idea is to create a source of revenue for UW–Madison to implement district-wide BMPs by collecting a fee (similar to a stormwater utility) from a project which may be unable to achieve the performance standards for their particular building. This requires additional study by FP&M staff and campus leadership to determine the feasibility of such a fund.

In light of these issues, this Green Infrastructure and Stormwater Master Plan recommends the CPC-adopted policy of meeting native conditions be re-addressed and clarified.

Adding to the complexity, the Department of Administration Division of Facilities Development (DOA DFD), which funds and oversees many projects on campus, has adopted Sustainability Guidelines which have separate stormwater standards which loosely follow the USGBC LEED stormwater credits. The DFD guidelines measure slightly different metrics and are therefore difficult to compare with the proposed campus performance standards but in general are a similar level of stringency and can be accomplished through many of the same practices.

Regulatory Framework

As described earlier in this document, UW–Madison is subject to regulatory requirements for stormwater through the WPDES Municipal Stormwater Discharge Permit issued by the WDNR. In addition, although UW–Madison is a state-owned institution, since the campus is located within the City of Madison, UW–Madison has enforced an informal policy of requiring construction projects on campus to adhere to City of Madison stormwater performance standards which are documented in Chapter 37 of their municipal ordinances. However this policy has not been formally adopted or documented.

Table 5-1 summarizes the various post-construction performance standards which are applicable to UW–Madison’s campus.

Proposed Site-Based Stormwater Standards

As part of the Green Infrastructure Master Plan, it is recommended that the UW–Madison adopt a formal set of stormwater management performance standards which supersede previously adopted standards and which are consistently enforced on major construction projects and renovations. There will always be exceptions to the rule in that not every project will be able to meet proposed standards without undue hardship or cost. However, with clearly defined standards clarity will be provided to design teams and to UW–Madison reviewers as to what standards should be achieved.

The following outlines the proposed stormwater management performance standards which UW–Madison should adopt to reflect campus values and achieve current and anticipated regulatory requirements.

To meet the campus goals and objectives for stormwater management including the need to meet regulatory requirements, the following standards will be mandated for all future construction projects which disturb more than 20,000 square feet.

Each project site must adhere and meet the regulatory requirements for that site including applicable municipal zoning requirements. Every project design team must determine the regulatory requirements and address the site’s compliance to those requirements. The UW–Madison imposes the following requirements that may be above the regulatory requirements.

Proposed Site-Design Standards (Post-Construction)

Total Suspended Solids

Best management practices shall be designed, installed, and maintained to control total suspended solids (TSS) carried in runoff from post-construction building sites. These BMPs should reduce the total annual suspended solids by 80 percent for all new development or redevelopment projects, regardless of size, as compared with predevelopment (pre-construction) loading.

At least 40 percent of the required TSS reduction must be met on-site and off-site mitigation may account for the remaining 40 percent reduction. Off-site mitigation should occur within the same watershed as the project within the Campus Development Plan Boundary (either the Lake Mendota or Lake Monona watershed). If no physical location is available for an off-site BMP then

the project may contribute financially to another planned or completed off-site stormwater management project in lieu of on-site controls.

Volume Reduction

Volume reduction is one of the highest stormwater management priorities on campus. Best management practices shall be designed, installed, and maintained to reduce the total volume of runoff leaving a site by the equivalent of one inch of runoff volume based on average annual rainfall. If this is not feasible, off-site infiltration or volume reduction practices may be utilized to meet this requirement as part of the project stormwater plan.

Peak Discharge

Peak discharge rates from each project site will be controlled as necessary to mitigate erosion of downstream open channels and damage to conveyance systems including outfalls. Best management practices shall be employed as needed to maintain or reduce the peak runoff discharge rates, to the maximum extent practicable, as compared to predevelopment conditions for the 2-year 24-hour design storm event. This requirement shall be evaluated for each drainage channel separately.

Peak discharge shall also be managed as necessary to mitigate known downstream flooding, conveyance backups, or other system failures. Discharges will be controlled for the 2 and 10-year design storm event or for those design storm events required by the conveyance owner. This requirement shall be evaluated for each drainage system separately.

Where the downstream conveyance system for a project site is owned by a neighboring municipality (City of Madison or Village of Shorewood Hills), the project site must meet that municipality’s peak discharge performance standard.

Table 5-1 Matrix of Relevant Applicable Post-Construction Stormwater Performance Standards

Performance Standard	Current NR 151/216	DFD Sustainability Guidelines	Rock River TMDL WLA & New Permit Target	City of Madison, Chapter 37
Total Suspended Solids				
TSS reduction (post-construction site)	80% for new development, 40% for redevelopment (applies to roads and parking surfaces), compared with no controls.	80% TSS removal, all projects	Not specified on a per site basis	80% for new development or redevelopment in TMDL areas, compared with existing condition.
Total Phosphorus				
TP reduction (post-construction site)	Not specified	40% TP removal (average annual basis), all projects	Not specified on a per site basis	Not specified on a per site basis
Oil & Grease Control				
Oil & grease control	BMP's Required for Fueling and Vehicle Maintenance Areas	N/A	N/A	Applies if ≥ 40 Parking Spaces. Treat first 0.5 inches of runoff for oil & grease.
Runoff Rate Control				
Runoff rate control	Maintain 1-yr & 2-yr, 24 hr predevelopment peak flow (except where discharging directly to a large lake or river).	Maintain 1.5-yr 24-hr predevelopment peak discharge ($<50\%$ imperviousness) or 25% decrease in rate and quantity of runoff ($>50\%$ imperviousness).	N/A	Maintain 2-yr & 10-yr, 24 hr predevelopment runoff rate; safely pass 100-yr; applies if $>20,000$ SF increase in impervious area.
Infiltration				
Infiltration volume (annual basis)	Maintain 60-90% of predevelopment infiltration volume (depending on site imperviousness), redevelopment projects exempt.	Not specifically stated; see runoff rate control.	N/A	New Development: maintain 90% of predevelopment volume.
Protective Areas				
Protective areas	No impervious surfaces in protective areas (50' for lakes and perennial streams), redevelopment projects exempt.	N/A	N/A	Comply with NR 151

Construction Erosion Control & Sediment Standards

A significant source of sediment and other pollutants that end up in the Yahara Lakes comes from construction sites. Despite erosion control permitting and monitoring processes, sediment-laden runoff is a heavy contributor to phosphorus in our waters. It is critical that every construction site on UW–Madison campus, regardless of size, set a positive example by treating erosion control practices seriously and enforcing standards.

Currently WDNR requires that all sites which disturb greater than one acre of land obtain coverage under a general erosion control WPDES permit. The City of Madison enforces erosion control permitting for sites greater than 4,000 square feet. While formal permits may not be necessary for smaller projects, UW–Madison should insist that all projects have erosion control plans and implement BMPs to minimize the amount of sediment leaving the site through runoff.

WDNR and the city now measure sediment from construction sites by tons per acre per year, as calculated by the Urban Soil Loss Equation (or USLE). WDNR enforces this on one-acre sites, the city on sites greater than 4,000 SF. UW–Madison should follow this standard of no greater than five tons of sediment per acre per year, but for all projects, regardless of size.

All projects must protect adjacent streets from tracked sediment which comes from construction vehicles which are improperly cleaned prior to leaving construction sites.

Table 5-2 shows a matrix of the existing erosion control standards which are applicable to UW–Madison.

Developed Urban Area Performance Standards

UW–Madison is regulated as an MS4 (municipal separate storm sewer system) for the purposes of its WPDES permit. In Wisconsin, NR 216 mandates that MS4s perform a series of practices and standards in addition to meeting set performance standards for the entire MS4 area. These include engaging in public education and outreach, public involvement and participation, illicit discharge detection and elimination, and pollution prevention activities and practices in addition to the post-construction and construction performance standards already discussed. As discussed in Chapter 2, with the adoption of the Rock River TMDL, UW–Madison's MS4 standard of meeting 40 percent TSS reduction on a campus-wide basis increased to equal the relevant waste load

allocation (WLA) set forth in the TMDL. Reach 64, which is the reach in which UW–Madison resides, has a WLA equivalent to 73 percent reduction of TSS.

Table 5-3 summarizes the developed urbanized area performance standards that apply to UW–Madison.

Pollution Prevention Policies and Practices

UW–Madison already engages in many pollution prevention activities on campus which contribute to its overall permit requirements and prevent contamination of runoff. These include regular street sweeping and sweeping of parking structures; collection of leaf litter and other yard waste and debris; proper storage of bulk materials such as road salt, topsoil, and compost; snow pile storage and runoff treatment practices; fueling and maintenance of vehicles in areas that drain to oil and grease traps or are covered; diversion of runoff from animal yards to manure holding tanks or sanitary sewers; and others. These practices should continue to be maintained and verified on a regular basis to ensure they are still performing as designed or serving their intended purpose.

It became clear, however, during the master planning process, that there is some ambiguity related to maintenance of existing BMPs on campus. This will only become more important as new BMPs are constructed. Currently below-surface features such as sumps are checked and maintained by the Plumbing Shop and above-surface features such as inlet grates and rain gardens are handled by Grounds. Therefore two different groups may be inspecting the same facilities but looking for different things. This system seems inefficient and would be better off handled by one group who systematically keeps records of BMP inspections and maintenance practices.

UW–Madison should also explore partnerships and cost-sharing agreements with the City of Madison, which has more maintenance vehicles and staff for things like sump cleaning and street sweeping (especially vacuum cleaning of permeable pavements on campus).

Table 5-2 Matrix of Applicable Construction Site Erosion and Sediment Control Standards

Performance Standard	Current NR 151/216	DFD Sustainability Guidelines	Rock River TMDL WLA & New Permit Target	City of Madison, Chapter 37
Erosion and sediment-control BMPs	Projects over 1 acre	N/A	N/A	Projects >4,000 sf
TSS reduction in construction runoff	80% reduction, projects over 1 acre	N/A	N/A	< 5 Tons/ac/yr
Prevent sediment tracking, discharge into waters	All projects	N/A	N/A	All projects

Table 5-3 Matrix of Applicable Developed Urbanized Area (MS4) Stormwater Performance Standards

Performance Standard	Current NR151/216	DFD Sustainability Guidelines	Rock River TMDL WLA & New Permit Target	City of Madison, Chapter 37
TSS Reduction (MS4 permit)	40% TSS for permitted MS4	N/A	73% TSS reduction from entire campus (Reach 64)	73% TSS reduction from entire campus (Reach 64)
Total Phosphorus (TP) Reduction (MS4)	Not specified	N/A	61% TP reduction from entire campus (Reach 64)	61% TP reduction from entire campus (Reach 64)
Public Education and Outreach	Implement education and outreach materials and programs	N/A	N/A	Comply with NR216
Public Involvement and Participation	Notify public of activities	N/A	N/A	Comply with NR216
Illicit Discharge Detection and Elimination	Establish a program to detect and enforce I&I	N/A	N/A	Comply with NR216
Construction Site Pollution Control	Procedures for inspecting, enforcing BMPs	N/A	Achieve TMDL WLA & ultimately, WQS	Applies to Land Disturbances > 4000SF
Post-Construction Site Stormwater Management	Enforce site BMPs and install regional BMPs to achieve performance standards	N/A	Achieve TMDL WLA & ultimately, WQS	Applies to Land Disturbances >20,000SF
Pollution Prevention	Source area controls (street sweeping, yard waste removal, etc)	N/A	Achieve TMDL WLA & ultimately, WQS	Comply with NR216