The MPCA conducted a review of pollutant removal credits for total suspended solids (TSS) and phosphorus. The objective was to evaluate existing credits in the Minnesota Stormwater Manual and the Minimal Impact Design Standards calculator and determine if the credits needed adjusting. The BMPs examined were biofiltration (bioretention with underdrain), constructed stormwater wetland, sand filter, permeable pavement (with underdrain), and swale.

We reviewed the following data sources.

* [http://www.deq.virginia.gov/Portals/0/DEQ/Water/Guidance/152005.pdf Chesapeake Bay Established Efficiency table]
* [http://www.vwrrc.vt.edu/swc/NonProprietaryBMPs.html Virginia Stormwater BMP Clearinghouse]
* [https://ncdenr.s3.amazonaws.com/s3fs-public/Energy%20Mineral%20and%20Land%20Resources/Stormwater/State%20Stormwater%20Permits/SSW%20Forms/SSW-SCM-Credit-Doc-20170511.pdf North Carolina Stormwater Control Measure Credit Document]
* [http://www.bmpdatabase.org/Docs/2014%20Water%20Quality%20Analysis%20Addendum/BMP%20Database%20Categorical\_StatisticalSummaryReport\_December2014.pdf 2014 International Stormwater BMP Database]
* [http://owl.cwp.org/mdocs-posts/fraley-mcneall-\_national\_pollutant\_removal\_perf\_v3/ Center for Watershed Protection National Pollutant Removal Performance Database – Version 3]

The following table summarizes the results. To access the date table used to generate the summary information, click here.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Pollutant** | **Source** | **Bioretention (underdrain)** | **Wetland** | **Sand filter** | **Permeable pavement** | **Swale with underdrain** |
| TSS | Minnesota Stormwater Manual | 85 | 73 | 85 | 74 | 68 |
| MIDS calculator | 60 | 68 | 85 | 74 | 68 |
| Virginia |  | 60 | 80 | 70 |  |
| Virginia Level 1 | 55 |  |  |  |  |
| Virginia Level 2 | 80 |  |  |  |  |
| North Carolina | 61 | 24 | 72 | -130 |  |
| International BMP database | 74 | 62 | 83 | 72 | 22 |
| Center Watershed Protection | 59 | 72 | 86 |  |  |
| **Median** | **61** | **65** | **84** | **72** | **68** |
| TP | Minnesota Stormwater Manual | No comparison made. Values in MN manual depend on multiple factors. | 38 | 50 | 45 | 20 |
| MIDS calculator | 30 | 47 | 45 | 20 |
| Virginia | 45 | 60 | 50 |  |
| Virginia Level 1 | 50 | 60 | 59 | 52 |
| Virginia Level 2 | 75 | 65 | 81 | 76 |
| North Carolina | 24 | 45 | 30 |  |
| International BMP database | 62 | 41 | 43 | -55 |
| Center Watershed Protection | 72 | 59 |  |  |
| **Median** | **47.5** | **54.5** | **45** | **20** |

The data indicate the Minnesota Stormwater Manual reasonably agrees with values from the other sources with the exception of TSS in biofiltration BMPs. The Construction Stormwater General Permit states that filtration systems must be designed to remove at least 80 of TSS. Consequently, the removal percentage for biofiltration practices must be at least 80 percent. We thus lowered the TSS credit for biofiltration to 80 percent. Biofiltration practices include tree trenches and tree boxes.