APPROVED BY USWG ON 5/15/2018 AS A BMP CREDIT OPTION
Revised July 2018 by WTWG

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From: Tom Schueler and David Wood, CSN

To: Urban Stormwater Work Group

Re: Nutrient Reduction Credit for Conservation Landscaping

1. Background

In March of 2018, the USWG discussed potential ways to credit conservation landscaping for nutrient reduction in the context of the Chesapeake Bay watershed model. A conservation landscaping credit would fill an key gap by enabling homeowners, institutions and municipalities to manage their open space as meadows rather than intensively managed turf grass. Based on subsequent communications with VA DEQ and DOEE staff, we have drafted a proposal to provide credit for conservation landscaping as a homeowner BMP retrofit, as follows:

2. Definition of Conservation Landscaping

Definition: Conservation landscaping areas are areas of managed turf that are converted into perennial meadows using species that are native to the Chesapeake Bay region. The landscaping areas are slightly depressed so they can hold rainfall and, in some cases, treat runoff from adjacent hard surfaces. Conservation landscaping is designed to provide habitat for birds and pollinators, and does not rely on mulch to suppress weeds over the long term.

Conservation landscaping may also be described as urban meadows, Bay-scapes or Bay-wide landscaping practices. More details on conservation landscaping can be found in Lane and Schueler (2013) and references cited therein.

3. Proposed Credit

Two options are offered for credit:

Option 1: Conservation Area (Turf)

The credit is calculated by applying the removal rates provided in Table 1 to the unit loads produced by urban turf grass, adjusted for the surface area of the conservation landscaping (usually a fraction of an acre).

Option 2: Conservation Area with IC Run-on.

In this situation, additional credit is calculated for the surface area of adjacent impervious cover that runs onto the conservation landscape. The load for the impervious cover is multiplied by the load reduction values in Table 1 to determine the nutrient load removed (which is in addition to the turf load reduction calculated under Option 1).

Note: to prevent the runon from overwhelming the conservation area, the contributing IC area cannot exceed twice the conservation landscaping area.

Table 1: Removal Efficiency for Conservation Landscaping			
Pollutant	Sediment	Total N	Total P
Removal Rate*	0% **	78%	50%
WTWG Rate * **	**0%**	**39%**	**25%**
** Nutrient removal rates based on differential load for managed turf grass compared to the load for the "mixed-open natural" land use category created for the new Phase 6 watershed model (see Schueler and Wood, 2018).			
** No sediment removal is expected for conservation landscaping since it's vegetative cover is equivalent to that provided by turf grass (UNM EPR, 2013).			
*** Conservative removal rate recommended by WTWG applies to the approved BMP (currently interim; used for WIP planning purposes only). The BMP can be used for annual progress reporting once the model lock down period expires in April 2019.			

4. Technical Rationale

Conservation landscapes reduce nutrient loads for several reasons. The first reason is that they do not receive any fertilizer inputs, which is major source on N export for urban turf grass. The second reason is that the biomass of each conservation area is "recycled" back into the soil every year. (unlike lawn clippings that can wash off). This helps conservation areas build up organic matter and improve soil quality over time, thereby retaining more nutrients. Lastly, the deeper root systems associated with meadow plants extend further into the soil profile, help de-compact urban soils and enhance the soil microbial community.

5. Qualifying Conditions

Several minimum criteria need to be met before conservation credits can be granted.

- The turf conversion needs to follow a plan to sustain the meadow landscape over the years. This will usually include the methods to:
    - initially prepare the site (e.g., dethatching, tilling, soil amendments).
    - establish the meadow plant community (seeding/container plants) including native plant species used to improve biodiversity from current conditions.
    - maintain the conservation area to arrest succession and remain in a meadow state (e.g., biannual mowing, invasive species removal, controlled burns, etc.).

- Most communities that provide incentives to build and maintain conservation landscapes have established effective criteria for homeowners. A good example of these criteria can be found in the District of Columbia River's Smart Homes program (could use a link here). In general, any local conservation area criteria should be followed to earn this credit.

- **Note:** This IS NOT a credit for normal landscaping in residential or commercial areas. Any landscaping project that requires continuous mulch replacement is not eligible for this credit (although rain gardens may be eligible as an on-site retrofit --- see CBP, 2012).

6. Eligibility

- The credit applies to all conservation areas that have been installed since 2009 and will be verified 2018 or 2019.

- No credit is allowed for conservation landscaping installed prior to 2009 since it now accounted for in the mixed-open natural land use category in the Phase 6 CBP watershed model.

7. Practice Reporting

Communities that operate incentive programs to install conservation areas on public or private lands will likely be the ones reporting this practice.

To streamline reporting, they may submit the total acreage of landscape conservation each year from multiple property owners, although they will need to keep records on each individual project to assist in future verification.

Communities that have access to the SMART tool to provide easier tracking and reporting of conservation landscape areas. The SMART tool should become available in PA, MD, and VA later in 2018.

8. Verification

Since most conservation landscapes will be very small in area (usually much less than one acre in size), they can be a hard practice to inspect and verify.

Conservation landscaping should undergo the same verification procedures for homeowner BMPs and on-site retrofits (CBP, 2012, Goulet and Schueler, 2014), namely:

- Their condition should be inspected every five years, using visual indicators that the conservation landscape still exists and functions as a meadow
- Self-reporting of these indicators by homeowners using digital photos is acceptable.

- Alternatively, a community can elect to inspect a subset (10%) of the conservation landscaping areas in their jurisdiction

9. References

Chesapeake Bay Program (CBP). 2012. Recommendations of the expert panel to define removal rates for urban stormwater retrofit projects.

Goulet, N. and T. Schueler. 2014. Revised memo: application of CBP approved urban BMP protocols to credit nutrient reduction associated with installation of homeowner BMPs. USWG recommendations, as approved by Water Quality Goal Implementation Team. April, 2014.

Lane C. and T. Schueler. 2013. Homeowners guide for a more Bay-friendly property. Chesapeake Stormwater Network. Ellicott City, MD.

Schueler, T. and D. Wood. 2018. Request for a land use credit for conversion of turf to mixed-open land use. Draft memo submitted to USWG. March 7, 2018.

Appendix A.
Technical Requirements for Entering Conservation Landscaping Practices in Scenario Builder and the Chesapeake Bay Watershed Model

Presented to the WTWG July 5, 2018
Revised after WTWG and WQGIT Comments

Background: In accordance with the *Protocol for the Development, Review, and Approval of Loading and Effectiveness Estimates for Nutrient and Sediment Controls in the Chesapeake Bay Watershed Model* (WQGIT, 2015) each new BMP must have a technical appendix developed with CBPO staff and approved by the Watershed Technical Workgroup (WTWG).

The purpose of this technical appendix is to describe how the Urban Stormwater Workgroup's recommendations for crediting Conservation Landscaping will be integrated into the Chesapeake Bay Program's modeling tools including NEIEN, Scenario Builder and the Watershed Model.

Q1. How is conservation landscaping defined in the Chesapeake Bay Watershed Model?

A1. Conservation landscaping is defined as the conversion of managed turf into actively maintained perennial meadows, using species that are native to the Chesapeake Bay region. The landscaping areas are slightly depressed so they can hold rainfall and, in some cases, treat runoff from adjacent hard surfaces. Conservation landscaping is designed to provide habitat for birds and pollinators, and does not rely on mulch to suppress weeds over the long term.

Q2. What are the qualifying criteria for conservation landscaping credit in the Phase 6.0 Watershed Model?

A2. The turf conversion needs to follow a plan to sustain the meadow landscape over the years. This will usually include the methods to:

- initially prepare the site (e.g., dethatching, tilling, soil amendments).
- establish the meadow plant community (seeding/container plants) including native plant species used to improve biodiversity from current conditions.
- maintain the conservation area to arrest succession and remain in a meadow state (e.g., biannual mowing, invasive species removal, controlled burns, etc.).

Q3. Which land use categories are eligible to receive nutrient and sediment reduction credit from conservation landscaping in the Phase 6.0 Watershed Model?

A3. Nutrient and sediment reduction credit from "conservation landscaping" would be applied to the "turf grass" or "tree canopy over turf" land use. If the conservation landscaping also treats run-on from adjacent impervious cover, it can be applied to "roads", "buildings and other", or "tree canopy over impervious".

Q4. How much nitrogen, phosphorus and sediment reduction credit are associated with conservation landscaping?

A4. The nutrient and sediment reduction efficiencies are outlined in Table 1:

Table 1: Removal Efficiency for Conservation Landscaping			
Pollutant	Sediment	Total N	Total P
Removal Rate*	0% **	78%	50%
WTWG Interim Rate * **	**0**	**39%**	**25%**
* Nutrient removal rates based on differential load for managed turf grass compared to the load for the "mixed-open natural" land use category created for the new Phase 6 watershed model (see Schueler and Wood, 2018).			
** No sediment removal is expected for conservation landscaping since it's vegetative cover is equivalent to that provided by turf grass (UNM EPR, 2013).			
*** Conservative removal rate recommended by WTWG applies to the approved BMP (currently interim; used for WIP planning purposes only). The BMP can be used for annual progress reporting once the model lock down period expires in April 2019.			

Q5. How are conservation landscaping practices simulated in the Phase 6.0 Watershed Model?

A5. Conservation landscaping will be modeled as an efficiency BMP. The percent reductions in Table 1 will be applied to the nutrient and sediment loads for the turf grass on which it is installed. If the conservation landscaping also treats impervious cover run-on, an additional efficiency will be applied to the load from the contributing impervious land use.

Q6. What do jurisdictions need to report to NEIEN in order to receive reductions for conservation landscaping?

A6. Communities that operate incentive programs to install conservation areas on public or private lands will likely be the ones reporting this practice. To streamline reporting, they may aggregate individual conservation landscaping BMP data into a single practice at the county level, which the local government would then report to the state without any specific geographic location data (apart from the river-basin segment or locality in which it occurred). They will still need to keep records on each individual project to assist in future verification. This is consistent with the reporting guidance approved by the Water Quality Goal Implementation Team for Homeowner BMPs (Goulet and Schueler, 2014)

For conservation landscaping credit, jurisdictions will need to report the following to NEIEN:

- *BMP Name*: "Conservation Landscaping"
- *Measurement Names*: Acres of conservation landscaping; Acres of run-on
- *Geographic Location:* Qualifying NEIEN geographies including: Latitude/Longitude; *or* County; *or* County (CBWS Only); *or* Hydrologic Unit Code (HUC12, HUC10, HUC8, HUC6, HUC4, State (CBWS Only)
- *Date of Implementation:* Year installed
- *Land Uses:* Turf Grass; Roads; Buildings and Other; Tree Canopy over Turf Grass; Tree Canopy over Impervious

Q7. Is there a cap on how much impervious cover run-on can be treated by conservation landscaping?

A7. Yes. The contributing impervious cover area cannot exceed twice the conservation landscaping area.

Q8. Is conservation landscaping a cumulative or annual BMPs?

A8. Conservation landscaping is a cumulative BMP. The credit duration is 5 years. Conservation landscaping should undergo the same verification procedures for homeowner BMPs and on-site retrofits (CBP, 2012, Goulet and Schueler, 2014).

Q9. Can conservation landscaping be combined with other practices to treat runoff from developed land uses?

A9. To prevent confusion and possible double-counting, aggregate homeowner BMP data, including conservation landscaping, will be entered as a unique practice in Scenario Builder. Like stormwater retrofit practices, they cannot be combined with other stormwater retrofits. If conservation landscaping is part of a treatment train approach, the predominant practice should be reported for the entire site using the Stormwater Performance Standards reporting requirements (Schueler and Lane, 2015). Conservation landscaping can be combined with other non-structural urban practices, such as urban nutrient management plans, and they will be applied sequentially to avoid double counting.

References Cited:

Chesapeake Bay Program (CBP). 2012. Recommendations of the expert panel to define removal rates for urban stormwater retrofit projects.

Goulet, N. and T. Schueler. 2014. Revised memo: application of CBP approved urban BMP protocols to credit nutrient reduction associated with installation of homeowner BMPs. USWG recommendations, as approved by Water Quality Goal Implementation Team. April, 2014.

Schueler, T. and C. Lane. 2015. Updated Frequently Asked Questions (FAQ) for Stormwater Retrofits and Urban BMPs Built to State Stormwater Performance

Standards. USWG recommendations, as approved by Water Quality Goal Implementation Team. May, 2015.