Second Draft
Proposal for Urban Stormwater BMP Reporting, Tracking and Verification

Developing a Verification Framework for the Chesapeake Bay

There is a growing demand for the tracking and reporting on practices and technologies to expand well beyond the sources the Bay watershed jurisdictions have traditionally relied upon—state agricultural departments and environmental agencies, USDA, and county conservation districts. Non-governmental organizations, private sector third party consultants, technical certified planners and businesses, agricultural producers, and even individual homeowners are now implementing and reporting on practices. This chorus of calls for expanded tracking and reporting of practices is often countered by expressions of the need for strengthened verification of the installation and maintenance of the array of pollution prevention and reduction practices. Given the ever increasing importance that accounting for implemented practices is taking on within the partnership—Bay TMDL reasonable assurance, two-year milestones, offsets, tradable credits—the Partnership must agree to a framework whereby we can have both expanded tracking and reporting of practices AND verifiable confidence in the outcome of those implemented practices.

Calls for/Commitments to Verification

The implementation, tracking, and reporting of these pollution reductions practices and technologies has been at the center of the Partnership's Bay restoration efforts for close to three decades. Within the past two years, there have been numerous requests for and now commitments to improving the accountability of actions taken to install technologies and implement practices which prevent or reduce the loads of nutrients and sediment to Chesapeake Bay and its tidal tributaries and embayments.

The Citizens Advisory Committee has repeatedly called on the Partnership to provide for transparent and open verification of cost shared as well as non-cost shared best management practices tracked and reported by the watershed's seven jurisdictions.

The President's Chesapeake Bay Executive Order Strategy committed the U.S. Department of Agricultural (USDA) and the U.S. Environmental Protection Agency to develop and implement "mechanisms for tracking and reporting of voluntary conservation practices and other best management practices installed on agricultural lands" by July 2012.

Within its Chesapeake Bay Independent Evaluation Report, the National Research Council's (NRC) panel put forth a series of five specific science-based conclusions all focused on their key finding that "accurate tracking of BMPs is of paramount importance because the CBP relies upon the resulting data to estimate current and future nutrient and sediment loads to the Bay."

The 2010 Chesapeake Bay TMDL's Appendix S outlines the common elements from which EPA expects the watershed jurisdictions to develop and implement offset programs.

Background on Urban Stormwater BMPs

As part of the development review process, localities in the Chesapeake Bay typically conduct a post-construction inspection of stormwater BMPs to ensure that it is functional, maintain an "as-built" project engineering files for the BMP, and inspect the BMP periodically to ensure that it is performing. The frequency of maintenance inspections ranges from 3 to 5 years, depending on the permit status of the jurisdiction. Phase 1 and Phase 2 communities have NPDES MS4 permit conditions which require them to have programs and staff in place to ensure that maintenance inspections are done according to a prescribed cycle. In addition, most MS4 communities have an annual reporting requirement, and often provide aggregate information on the number and type of BMPs that are installed during the reporting period.

Consequently, an inspection framework currently exists which could be adapted to provide the foundation for a reliable BMP reporting, tracking and verification system. However, several problems need to be overcome to develop an effective system:

- Larger communities have an existing urban BMP inventory that numbers in the thousands, with hundreds more being added each year.

- Most localities currently do not report all of the individual BMP information needed by the state to prepare the input deck for the CBWM (e.g., EPA CBP BMP classification, drainage area served, geographic location and year of installation).

- Very few localities have digitized their individual BMP files and integrated them within a spreadsheet and/or GIS system.

- In the absence of good geo-spatial data, the prospect for double counting of BMPs is significant, particularly when multiple BMPs of different ages are located within same drainage area. In other cases, BMPs that have failed or don't really meet the CBP BMP definition are counted when they should not be.

- Most localities have little experience in reporting BMP implementation data for new development to the state and no experience in reporting BMPs for existing development (e.g., retrofits). This is particularly true for communities that are not covered by a MS4 permit.

- Several urban BMPs are installed outside the local development review process, and therefore may not be properly counted or reported (e.g., street sweeping, urban nutrient management, reforestation, urban fertilizer management, tree planting and stream restoration). Localities will need to coordinate closely with multiple agencies and/or departments to accurately report this BMP data.

- Most localities do not report on voluntary BMPs that are installed by homeowners or watershed groups, even if they provide them financial or other incentives to do so.

- Most Bay states are just now developing tracking systems to aggregate the BMPs reported by individual localities, and several have not been able to keep up with BMP information submitted by 70 to 400 MS4s in their jurisdiction .

- Up to now, few states have allocated staff resources to enforce MS4 permit maintenance conditions, verify that local BMP information is accurate, and cull out BMPs from the CBWM input deck that are no longer achieving their intended nutrient or sediment removal rate.

- Many urban BMPs are installed in non-regulated areas in the watershed that are not covered by Ms4 permits, and therefore lack enforceable BMP maintenance and reporting requirements. This is less of an issue in states that have state-wide stormwater regulations (MD/VA) or where the state exercises primary authority for local BMPs review (PA). It is generally acknowledged, however, that the quality of reporting and the frequency of maintenance are weaker in smaller communities.

- Perhaps the greatest weakness of the current system is that current post construction and maintenance inspection efforts are not oriented toward verifying the actual pollutant removal performance of the BMP in the field. Instead, local inspections primarily focus on whether a BMP was installed per design, and that its future condition will not cause harm to public safety and/or cause nuisance problems in the community. Consequently, it will be necessary to develop improved inspection guidelines that utilize visual indicators to verify that the hydrologic performance of the BMP is adequate to still achieve the intended nutrient and sediment removal rate.

- The current explicit assumption is that nearly all structural urban BMPs are permanent in nature. This means that a twenty year old wet pond keeps on performing in perpetuity. Consequently, BMP review panels have tended to discount the removal rates for these practices to account for their age, diminished capacity and lack of maintenance.

- Lastly, the paradigm on an individual urban BMP is changing as Bay states implement new stormwater performance standards. Going forward, new development sites will be served by a system of many different credits, disconnections and micro-practices. An expert BMP panel has been convened on how to report these new composite BMPs, but localities are struggling with how to adapt their current BMP maintenance programs to effectively inspect the condition and performance of distributed LID practices.

Recommended Principles for Urban BMP Reporting, Tracking and Verification

1. *Shift from permanent BMP removal rates to shorter term BMP removal credits*. The basic idea is limit the fixed credit for a relatively short duration of time. The credit can be only renewed or extended based on a field inspection that verifies that the BMP is still performing as designed. Each BMP will require specific visual indicators of performance that can be quickly determined in the field. While progress is being made on these visual indicators (see, for example, the revised field sheet prepared by CWP for Virginia projects), more technical work and field training will be needed to develop final indicators that can be used across the Bay watershed.

   The duration of the credit would depend on the nature of the BMP, as shown in the three tables below:

Class 1 Existing CBP-Approved Structural BMPs	
This class includes conventional stormwater BMPs that are typically installed through a local and/or state stormwater plan review process, and subsequently inspected by local stormwater authority	
BMP Type	*Credit Duration **
Wet Ponds	?
Constructed Wetlands	?
Dry Detention Ponds	?
Dry Extended Detention Ponds	?
Infiltration	?
Filtering Practices	?
Bioretention	?
Permeable Pavement	?
Grass Channels	?
Bioswale	?
** In general, the duration of the credit for structural practices may last many years, with adequate maintenance; however, individual practices may differ in longevity.*	

Class 2 Existing CBP-approved Less Structural BMPs	
This class includes less structural stormwater BMPs that are typically installed by a municipal agency and may be reported via MS4 reports or not all. E&SC is a short term practice administered through the local land development authority	
BMP Type	*Credit Duration*
Urban Nutrient Management	?
Street Sweeping	?
Forest Buffers	?
Tree Planting	?
Impervious Surface Reduction	?
Erosion and Sediment Control	?
** In general, the duration of these credits are fairly short term and may be reduced due to poor maintenance.*	

Class 3 New BMPs Developed Through Expert Panel Process	
This class of practices are applied often applied to existing development (w/ exception of performance standards) and the qualifying conditions, and reporting/verification mechanisms are being developed through the CBPO expert panel process	
BMP Type	*Credit Duration*
Stormwater Retrofit	?
Stream Restoration	?
New State LID Performance Standards	?
Urban Fertilizer Management Practices	?
Practices Reviewed by Future Expert Panels	?

The general idea is to tie the BMP duration to multiples of the maintenance inspection frequency cycle required under MS4 permits or local approval procedures.

2. *Initial Verification of Performance*. Localities will need to provide a post construction verification that the urban BMP was installed properly, meets or exceeds the design standards for its CBP BMP classification, and is functioning hydrologically as designed prior to submitting the BMP credit to the state tracking database. This will require development of improved BMP construction inspection protocols that can verify initial performance of the BMP. The initial verification could be provided either by the designer or the local inspector as a condition of project acceptance.

3. *Local BMP Reporting to the State:* Localities should submit basic documentation to the state for each individual urban BMP, including the BMP type, GPS coordinates for the project location, year installed, the 12 digit watershed in which it is located, the unit area treated, the nutrient reduction credit claimed (and the method used to compute it), and a signed statement that their development review process ensures that the BMP was installed properly.

4. *Local BMP Recordkeeping*. Localities should maintain a more extensive project file for each urban BMP project installed (i.e., construction drawings, as-built survey, digital photos, inspection records, and maintenance agreement, etc). The file should be maintained for the lifetime for which the BMP removal credit will be claimed. Localities are encouraged to develop a GIS-based BMP tracking system in order to schedule routine inspections and maintenance activities over time.

5. *Ongoing Field verification of BMP performance*. Local inspectors would look at visual and other indicators to ensure that individual BMPs are still capable of removing nutrients/sediments. These performance inspection field protocols still need to be created, and local stormwater inspectors would need additional training to learn the expanded protocols. If the field inspection indicated that the BMP was not performing to its standard, the nutrient reduction credit would be reduced or eliminated. The BMP credit could be renewed, if corrective maintenance actions were verified that renewed BMP performance.

6. *State Oversight of Local BMP Reporting*. Bay states, under either their MS4 permit or state-wide stormwater delegation authority, would require the localities to conduct quality control on the BMPs they have submitted for credit at the end of each permit cycle (or every five years). To provide accountability, Bay states may elect to audit a subset of local BMP project files, analyze local maintenance inspection records, or conduct joint field BMP inspections to verify performance. The state oversight process needs to be transparent and publicly accessible so that NGOs, watershed groups and other stakeholders can be confident that BMP implementation is real.

7. *EPA Review of State Verification Oversight*. EPA Region 3, under its existing NPDES MS4 permit oversight role, would periodically review the implementation of state BMP verification protocols to ensure they are being effectively implemented.

USWG Role in Refining the Verification Process

There are many technical details involved in the verification of urban BMPs. The recommended approach is to develop a unique protocol for each class of CBP approved urban BMPs.

- The Urban Stormwater Workgroup should work to gain consensus on verification principles for Class 1 and Class 2 urban BMPs in the Spring of 2012, and utilize an ad-hoc sub-group to work w/ CSN and potential contractor to develop more specific inspection protocols, including visual indicator, by end of 2012.

- Verification protocols for forestry-related BMPs (reforestation, stream buffers, tree planting) should be addressed by the Forestry workgroup, with USWG consultation.

- Verification protocols for new urban BMPs should be addressed through the Expert BMP panel process, and all recommended protocols would be sent up to the Water Quality Goal Implementation Team for review and approval.

It should be noted that the proposed BMP verification principles place most of the responsibility on local governments who currently have little experience in BMP tracking. This could potentially have a significant local fiscal impact for both staff to consolidate local BMP reports for the state and inspector "boots on the ground" to conduct the verification inspections. Therefore, it is recommended that:

- Local members of USWG should be tasked to evaluate the potential fiscal impact on localities associated with the proposed verification principles (and protocols). and recommend efforts to stream line the verification to reduce fiscal impact, while retaining reasonable assurance that the BMPs are performing effectively.

The USWG may also recommend steps by the Chesapeake Bay Program that could improve urban BMP verification, possibly including the following:

- Allocate resources to a consultant to develop improved BMP inspection protocols that can assess performance and be piggy-backed on to routine local stormwater maintenance inspections.

- Evaluate whether there is a reasonable "third party" verification scenario to reduce the staffing impact for local and state governments.

- Conduct several local pilot projects to test the urban BMP reporting, tracking and verification methods to ensure they are workable for local governments and the states.

- Work with the state partners to ensure that they develop common reporting spreadsheets and agree on the state accountability methods for BMP verification (i.e., Principle 6)

- Conduct local and state training on desktop and field methods for urban BMP verification once the preceding actions are completed. There is some existing budget within the CSN Chesapeake Bay Training Stormwater Partnership, but supplemental resources would be needed.