

USWG APPROVED DRAFT

Date: September 28, 2018

From: Tom Schueler and David Wood
Chesapeake Stormwater Network

To: Urban Stormwater Work Group
Stream Health Work Group
Interested Parties

Re: Formation of Technical Groups to Improve Stream Restoration Protocols

Background

The Stream Restoration expert panel report was approved five years ago (USR EP, 2013) but continues to generate controversy among practitioners, researchers, managers and regulators. This is not surprising, since stream restoration has become a widely used tool in the Bay restoration effort. Both the public and private sector have struggled to properly apply the new protocols, given the fast pace by which this new nutrient credit has been implemented across the Bay watershed.

Bay managers have responded by getting stakeholder feedback on what they need to properly apply the three stream protocols to maximize both pollutant removal and stream habitat. Some examples of these responses include:

- *Stream FAQ Document:* The USWG approved a “frequently asked questions” document on 2/18 that clarifies and interprets areas of past confusion with the protocols and how to properly report it for credit (Wood et al, 2018).
- *Stream Restoration Forums.* Bay-wide forums were held at MWCOG in Washington DC in February and Annapolis, MD in June. Each forum was jointly sponsored by the CBP Urban Stormwater and Stream Health work groups. One of the key outcomes from both forums was general agreement that small groups need to be formed to tackle key issues related to the protocols and the verification of stream restoration projects (CSN, 2018a and 2018b).
- *Defining Functional Uplift for Stream Restoration Practices.* The SHWG has led the way to promote the concept of functional uplift to ensure stream restoration projects exert a net positive impact on urban stream ecosystems. The SHWG has made defining and measuring functional uplift at individual projects a major priority in their most recent annual work plan.
- *Stream Restoration Science Presentations.* EPA Region 3 and MD DNR presented selected stream research to the USWG in June on the potential water

quality impact of several types of stream restoration projects in the coastal plain and piedmont of Maryland. Feedback was requested from the USWG, and the topic of a wider stream science meeting was discussed. A proposal was submitted in July to support a Bay-wide meeting to address this need (Goulet and Meyers, 2018), but it was not funded.

- *Legacy Sediment Removal Crediting.* PADEP has expressed concerns about how to properly apply (or adjust) the three protocols to best represent the sediment and nutrient reduction achieved by Legacy Sediment Removal (LSR) projects that have been installed in PA. While these issues were discussed by the expert panel when it deliberated in 2011-2103, the full research from early demonstration projects, such as Big Spring, were not available at that time. Staff from PADEP and stream restoration practitioners have requested more detailed guidance and design to improve crediting of LSR projects.

Formation of New Work Groups

Under the CBP BMP Review Protocol (WQGIT, 2016), sector workgroups can establish small teams to provide further detail and interpretation on expert panel reports that were previously approved by the CBP partnership. While the recommendations of these small groups must be subsequently approved by the USWG and the CBPO modeling team, they do not require approval through the formal expert BMP review panel process.

The USWG has elected to form four such groups to tackle outstanding issues involved with stream restoration, as follows:

- Group 1: Verifying Stream Restoration Practices
- Group 2: Crediting Outfall Stabilization Practices
- Group 3: Establishing Standards for Applying Protocol 1 (Prevented Sediment)
- Group 4: Adjusting Protocol 2/3 to Capture Floodplain/Stream Reconnection

The proposed charge and membership for each group are described below:

Group 1: Verifying Stream Restoration Practices

The Chesapeake Bay Partnership endorsed a policy that all urban BMPs must be verified in the field to ensure they are still earning their pollutant reduction credit towards the Bay TMDL. Most restoration projects undergo substantial monitoring for several years after construction, based on conditions in required state and federal permits. Once the permits expire, however, there are no specific guidelines on how to verify their performance going forward. The charge for this workgroup is to recommend general guidance on how the private and public sector can verify stream restoration projects in the Chesapeake Bay watershed. More detail on the charge is outlined in CSN (2018a) and summarized below:

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1. Define what constitutes an adequate as-built drawing for stream restoration projects, who is qualified to do them, and how they are to be used for verification purposes going forward.
2. Decide what, if any, quantitative data collected during project assessment and design should be retained to assist in future verification efforts.
3. Establish visual indicators that can rapidly determine whether an individual stream restoration project is still performing the water quality functions it was originally designed for.
4. Decide whether the condition and quality of the post-construction riparian and floodplain plant community still meets its project objectives over time.
5. Define specific thresholds for project failure that trigger the need for either (a) project repair, (b) follow-up forensic reach investigations or (c) or partial or complete loss of pollutant reduction credits.

The current roster for this stream group is provided in Table 1.

Table 1: Proposed Membership of Group 1 (Verification)		
Name	Affiliation	E-mail
Rich Starr	Ecosystem Planning and Restoration	rstarr@eprusa.net
Kathy Hoverman	KCI	Kathy.hoverman@kci.com
Tim Schueler	Hazen and Sawyer	tschueler@hazenandsawyer.com
Kip Mumaw	Ecosystem Services	kip@ecosystems-services.us
Neely Law	Center for Watershed Protection	nll@cwpl.org
Meghan Fellows	Fairfax County, DPWES	meghan.noefellows@fairfaxcounty.gov
Sandra Davis	US Fish and Wildlife Service	Sandra_davis@fws.gov
Jennifer Rauhofer	Stormwater Management Consulting	jr@mdswm.com
Josh Burch	DOEE	Josh.burch@dc.gov
Scott Cox	PADEP	sccox@pa.gov

Group 2: Crediting Outfall Stabilization Practices

The USWG considered a joint proposal by MDE and MD SHA at its April meeting to credit sediment and nutrient reductions for qualifying outfall stabilization projects. The basic proposal is to modify the prevented sediment protocol from the existing stream restoration report (USR EP, 2013) and apply it to this unique class of channel restoration projects. The USWG agreed that outfall stabilization has some major similarities to stream restoration practices, and a fifth pollutant reduction protocol may be warranted if it can be technically justified.

A small group was established in May to focus on an alternative method to estimate prevented sediment from outfall stabilization projects constructed to repair severe channel erosion in zero order streams (MD SHA, 2018). The roster for the group can be found in Table 2 and a more detailed charge is outlined in CSN (2018c). The group is currently completing a survey monkey instrument to compile their initial technical

reactions on crediting options. A kickoff meeting for the group is scheduled for late September.

Table 2. Membership of Outfall Stabilization Crediting Group		
Name	Affiliation	E-mail Address
Ray Bahr (S. Comstock)	MDE	Rbahr@mde.state.md.us
Stephen Reiling	DOEE	Stephen.reiling@dc.gov
Tracey Harmon	VDOT	tracey.harmon@vdot.virginia.gov
Brock Reggi	VADEQ	Brock.reggi@deq.virginia.gov
Karen Coffman	MD SHA	KCoffman@sha.state.md.us
Ryan Cole	MD SHA (alternate)	rcole@sha.state.md.us
Elizabeth Ottinger	US EPA Region 3	Ottinger.elizabeth@epa.gov
Carrie Traver	US EPA Region 3	Traver.carrie@epa.gov
Alison Santoro	MD DNR	Alisona.santoro@md.gov
Ted Brown	Biohabitats	Tbrown@biohabitats.com
Chris Stone	Loudoun County, VA	Chris.Stone@loudoun.gov
Erik Michelsen	Anne Arundel County	pwmich20@aacounty.org
Neil Weinstein	LID Center	nweinstein@lidcenter.org
Nick Noss (James Kaiser)	PA Turnpike Commission	Nnoss@paturndpike.com

Group 3: Establishing Standards for Applying Protocol 1 (Prevented Sediment)

The prevented sediment protocol (#1) has become the most widely applied stream restoration credit in the Bay watershed, and stakeholders from both the public and private sector have sought to clarify how it should be used on individual restoration projects, given the great variability in reported stream sediment loss that occurs from reach to reach.

The proposed roster for group 3 is provided in Table 3.

Table 3. Membership for Group 3		
Name	Affiliation	E-mail Address
Drew Altland	RKK	daltland@rkk.com
Lisa Fraley-McNeal	Center for Watershed Protection	lfm@cwpl.org
Joe Berg	Biohabitats	jberg@biohabitats.com
Rich Starr	Ecosystem Planning and Restoration	rstarr@eprusa.net
Josh Running	Stantec	Josh.running@stantec.com
Matt Meyers	Fairfax County, VA DPWES	Matthew.meyers@fairfax.county.gov
Jim Morris	JMT	jmorris@jmt.com
Bill Brown	PADEP	Will.brown@pa.gov
Jeff White	MDE	Jeff.white@maryland.gov
Josh Burch	DOEE	Josh.burch@dc.gov
Reid Cook	RES consultants	rcook@res.us
Ralph Spagnolo	EPA Region 3	spagnolo.ralph@epa.gov
Tess Thompson	Virginia Tech	thwynn@vt.edu
Joseph Sweeney	Water Science Institute	joe@waterscienceinstitute.org

While the charge is still under development, it will likely contain some of the following elements:

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- Provide more guidance on the minimum qualifying conditions for protocol 1 projects, with an emphasis on defining the maximum amount of bank armoring that can be used to stabilize banks and prevent erosion, while still maintaining stream habitat and functions in the project reach.
- Establish quality control standards for measuring key BANCs parameters in the field to ensure crews collect consistent and unbiased data that can be replicated by others. Some potential areas to focus on include:
 - Define bank full elevations properly
 - Accurately estimate NBS and BEHI scores
 - Ensure data quality control over entire project reach
- Determine whether it is possible to define regional default values for streambank soil bulk density and nutrient content (or whether designers need instead to collect soil samples within the project reach to estimate these two important parameters for protocol 1).
- Provide an update on the ongoing development of regional BANCs curves and recommend which curves are most appropriate for different physiographic regions and stream channel conditions across the Bay watershed.
- Provide more detailed guidelines on how to estimate stream sediment loss using the alternate local field monitoring or modeling options that are allowed for calculating Protocol 1. Any recommendations of project study design and benchmarks for data quality control and/or model documentation would be very welcome.

Group 4: Adjusting Protocol 2/3 to Capture Floodplain/Stream Reconnection

While original expert panel recognized the critical importance of floodplain reconnection in the design of stream restoration projects, it was not entirely confident on how to precisely compute its impact. Specific issues were how pollutant removal were influenced by sediment trapping and groundwater interaction between the stream, the hyporheic zone, the floodplain and any adjacent riparian wetland complexes.

Consequently, there has been strong interest to re-examine protocols 2 and 3 to make sure they effectively capture the interaction of the stream and its floodplain. Stakeholders would like to see more design examples on how to properly apply these two floodplain reconnection protocols (e.g., construction of legacy sediment removal and regenerative stormwater conveyance projects).

Table 4 presents the proposed roster for the group.

Table 4. Roster for Group 4 (Adjusting Protocols for Floodplain Reconnection)		
<i>Name</i>	<i>Affiliation</i>	<i>E-mail Address</i>
Joe Berg	Biohabitats	jberg@biohabitats.com
Drew Altland	RKK	daltland@rkk.org
Bill Stack	CWP	bps@cwpr.org
Scott Lowe	McCormick Taylor	sblowe@mcormicktaylor.com
John Hottenstein	Ecosystem Planning and Restoration	jhottenstein@eprusa.net
Jeremy Hanson	Virginia Tech	jchanson@vt.edu
Sujay Kaushal	University of Maryland	Skaushal@umd.edu
Joel Moore	Towson University	moore@towson.edu
Jens Geratz	Anne Arundel County DPW	pwgera00@aacony.org
Sean Crawford	Bayland Consultants	scrawford@baylandinc.com
Josh Burch	DOEE	Josh.burch@dc.gov
Jeff Hartranft	PADEP BWEW	jhartranft@pa.gov
Denise Clearwater	MDE Wetlands and Waterways	denise.clearwater@maryland.gov
Paul Mayer	EPA Region ORD	mayer.paul@epa.gov
Durelle Scott	Virginia Tech	dscott@vt.edu
Greg Noe	USGS	gnoe@usgs.gov
Chris Becraft	Underwood and Assoc	chris@ecosystemrestoration.com

While the charge is still being developed, it is expected to contain the following items:

- Determine if any pollutant reduction protocols from past or current CBP expert panels on wetland creation/restoration can be used to address floodplain reconnection and wetland dynamics.
- Ensure protocols reflect our current understanding of stream and floodplain dynamics and investigate potential standard methods to define post-restoration floodplain storage and sediment trapping capacity within the project reach.
- Determine how far the hyporheic box can be extended from the stream channel into the adjacent floodplain, especially when the project creates new wetlands.
- Evaluate how landscape position influences the pollutant reduction capability of floodplain reconnection projects (i.e., the relationship between the contributing upland watershed, the original and proposed stream reaches and degree that they both interact with the adjacent floodplain).
- Assess any new qualifying conditions needed to ensure that floodplain protocols are properly applied.

Plan to Get Small Groups to Achieve Consensus.

It will be a real bear to coordinate the efforts of 4 small groups and 2 larger work groups to get to consensus, even though everyone agrees that the protocols need to be improved to get better restoration projects in the Bay. Table 5 outlines the general management plan to work with the groups over the coming months, including some key dates and deadlines.

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Each group will need the active input and participation of every member to arrive at consensus. Each member will be expected to adhere to the following meeting ground rules:

- Quickly respond to doodle polls and participate in all work group calls
- Review all technical materials in advance of each meeting
- Promptly complete any assignments accepted during meetings/calls
- Clearly indicate where you stand on the consensus continuum (i.e., stop, hold, stand aside, agree w/ reservations, endorse)
- Where practical, provide constructive alternatives on the issues you object to
- Weigh in on each key issue (silence is deemed consent)
- Be respectful of other members of the group and facilitators
- No wind-bagging, model-bashing, long guitar solos or throwing shade on other panel members.

Table 5: Managing the Small Groups to Consensus

Factor	Group 1 Verification	Group 2 Outfalls	Group 3 Methods	Group 4 Floodplain
Start Date	5/18	9/18	10/18	11/18
End Date ¹	12/18	4/19 ²	6/19	9/19 ²
Group Lead	Schueler	Schueler	Wood	Schueler
Support Help	Wood	Wood Hanson	Schueler	Wood
More Members?	1 or 2	Full	2-3 ³	2-3 ⁴
Review/Approval	USWG, w/ CBPO, no expert panel review process ²			
Coordination	SHWG	& WTWG	SHWG	& WTWG
Notes: ¹ projected ² changes in protocol crediting must get CBP partnership approval by 4/19 to prevent model “lockout” ³ expertise in BANCS field measurements and streambank soil nutrients ⁴ experience in protocol calculations for LSR and/or RSC projects				

References

Chesapeake Stormwater Network (CSN). 2018a. Proposed Guidance for Verifying Stream Restoration Practices. 2nd Draft. Technical Memo. May 30, 2018.

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Wood, D., L. Fraley-McNeal and B. Stack. 2018. Frequently Asked Questions: Urban Stream Restoration BMP. Approved by Urban Stormwater Work Group in February 2018. Chesapeake Bay Program Office.