Appendix B: Technical Requirements to Enter Nontidal Wetland Creation and Wetland Rehabilitation BMPs in the Phase 6 Watershed Model

Version: 08/09/19 (DRAFT for CBP and WTWG review)

Presented to the WTWG for Review and Approval:

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 BMP expert panel develops a technical appendix to describe how the panel's recommendations will be integrated into the Chesapeake Bay Program's modeling and reporting tools including NEIEN, CAST and the Watershed Model.

This appendix and the current panel's report do not alter or affect existing BMP definitions or effectiveness values for similar practices that were outside the scope of the panel, e.g., Wet Ponds and Wetlands (Urban), Stream Restoration (Urban/Non-Urban) and Shoreline Management (Urban/Non-Urban).

Q1. How are these Wetland BMPs defined in the Phase 6.0 Chesapeake Bay Watershed Model?

A1. The panel's report includes definitions for four categories of nontidal wetland practices: restoration, creation, rehabilitation, and enhancement. The latest panel's recommendations do not change the existing definition or effectiveness estimates for wetland restoration in the Phase 6 Chesapeake Bay Watershed Model (CBWM), which were established by a previous BMP expert panel (Wetland Expert Panel, 2016). The basic definitions for the other practices (creation, rehabilitation and enhancement) are also unchanged (Table B-1) under the new panel's recommendations, but with new recommended effectiveness values and operational definitions of the practices as described in Table 2 of the report.

Table B-1. Categories of nontidal wetland BMPs in the Chesapeake Bay Program's Phase 6 Chesapeake Bay Watershed Model.

BMP Category	CBP Definitions for Phase 6 CBWM
Restoration	Re-establish The manipulation of the physical, chemical, or biological characteristics of a site with the goal of returning natural/historic functions to a former wetland.
Creation	Establish (or Create) The manipulation of the physical, chemical, or biological characteristics present to develop a wetland that did not previously exist at a site.

Enhancement	Enhance The manipulation of the physical, chemical, or biological characteristics of a wetland to heighten, intensify, or improve a specific function(s).
Rehabilitation	Rehabilitate The manipulation of the physical, chemical, or biological characteristics of a site with the goal of repairing natural/historic functions to a degraded wetland.

Q2. How will Wetland BMPs be simulated in the Phase 6.0 Watershed Model?

A2. Consistent with WEP (2016), the expert panel recommended that simulation of wetland BMPs vary by the type of practice. Functional gain practices treat upland acres only since they enhance or rehabilitate existing wetlands. Acreage gain practices treat upland acres and are also a land use conversion BMP in Phase 6 since they either re-establish or establish a wetland that was not there at time of implementation. The nutrient and sediment reduction credit for a land use conversion BMP equals the relative, or percent change in nitrogen, phosphorus and sediment load achieved by converting the existing land use to the appropriate wetlands land use.

Table B-2. Summary of proposed Wetland BMP simulation in the Phase 6 CBWM.

BMP Category	Land Use Conversion	Treatment of Upland Acres
Restoration*	YES	YES – based on physiographic region (WEP 2016)
Creation**	YES	YES – Report drainage area; if not, 1 upland acre per acre of created wetland (other), or 1.5 upland acre per acre (floodplain)
Rehabilitation**	NO	YES – Report drainage area; if not, 1 upland acre per acre of rehabilitated wetland (other), or 1.5 upland acre per acre (floodplain)
Enhancement***	Not recommended as a water quality BMP for TN, TP or TSS reductions	

*The efficiency values and the upland acres for Phase 6 Wetland Restoration are based on the WEP (2016) recommendations for the Restoration practice. The practice is included within this appendix for reference only.
**In accordance with its charge, the panel is recommending new efficiency values for these practices in the Phase 6 Watershed Model.
***As described in the report, the panel recommends that enhancement – as defined for CBP purposes – should no longer receive nutrient or sediment reductions in the Watershed Model.

Q3. What are the upland treatment efficiencies for Wetland BMPs in the Phase 6.0 Watershed Model?

A3. Upland treatment efficiencies for each Wetland BMP are summarized in Tables B-3 and B-4.

Table B-3. Summary of upland acres treated by each acre of wetland, by wetland BMP type and physiographic subregion.

Wetland BMP Category	Watershed Model HGMR	Upland Acres Treated per acre of BMP	
		Other Wetlands	**Floodplain Wetlands**
Restoration [No change from WEP 2016, for reference only]	*Appalachian Plateau Siliciclastic*	*1*	*2*
	Valley and Ridge Siliciclastic	*1*	*2*
	Blue Ridge	*2*	*3*
	Piedmont Crystalline Mesozoic Lowlands	*2*	*3*
	Western Shore: Coastal Plain Uplands Coastal Plain Dissected Uplands	*4*	*6*
	Eastern Shore: Coastal Plain Uplands	*1*	*2*
	Eastern Shore: Coastal Plain Dissected Uplands	*2*	*3*
	Coastal Plain Lowlands	*2*	*3*
	Piedmont Carbonate Valley and Ridge Carbonate Appalachian Plateau Carbonate	*2*	*3*
Creation	**N/A**	**Reported drainage area; otherwise, 1***	**Reported drainage area; otherwise, 1.5***
Rehabilitation	**N/A**	**Reported drainage area; otherwise, 1***	**Reported drainage area; otherwise, 1.5***
Enhancement	**N/A**	**N/A**	**N/A**

* Panel suggests that drainage area should be limited to 6 upland acres per acre created/rehabilitated for Floodplain; 4 upland acres per acre created/rehabilitated for Other/Headwater.

Table B-4. Summary of proposed upland treatment efficiencies for wetland BMPs in the Phase 6 Watershed Model

Wetland BMP Category	Efficiency applied to upland acres					
	TN% (existing)	**TN% (proposed)**	**TP% (existing)**	**TP% (proposed)**	**TSS% (existing)**	**TSS% (proposed)**
Restoration*	42	42	40	40	31	31
Creation**	16.75	30	32.18	33	9.82	27
Rehabilitation**	16.75	16	32.18	22	9.82	19
Enhancement***	16.75	N/A	32.18	N/A	9.82	N/A

Note: The efficiency values of 16.75% TN, 32.28% TP and 9.82% TSS are the average of the Phase 5 Wetland Restoration efficiencies for the Coastal Plain, Piedmont and Appalachian Plateau HGMs. These values were

adopted as a placeholder within the Phase 6 Watershed Model until a panel could convene and recommend effectiveness values.

*From WEP (2016), included for reference only. No changes recommended to the wetland restoration BMP or its effectiveness values.

**The efficiency value for these practices will treat the reported upland drainage area (acres); if the drainage area is unknown or not reported then one acre is treated per acre of wetland created or rehabilitated (1.5 acres per acre of BMP in the floodplain, when drainage area not reported).

***As described in the report, the panel recommends that enhancement – as defined for CBP purposes – should no longer receive nutrient or sediment reductions in the Watershed Model.

Q4. What should jurisdictions submit to NEIEN to receive credit for Wetland BMPs in the Phase 6 Model?

A4. For wetland restoration there is no change from WEP 2016 and jurisdictions should report the following information to NEIEN:

- *BMP Name:* Wetland Restoration – Floodplain or Wetland Restoration – Headwater
- *Measurement Name:* Acres of Wetlands Restored (Acres)
- *Geographic Unit:* Qualifying NEIEN geographies including: Latitude/Longitude; *or* County; *or* Hydrologic Unit Code (HUC12, HUC10, HUC8, HUC6, HUC4); *or* State
- *Date of Implementation:* Year the wetland was restored
- *Load Source:* All agricultural load source groups

For wetland creation, once the new recommendations are incorporated into the Model (see Q9 below), jurisdictions should report the following information to NEIEN:

- *BMP Name:* Wetland Creation – Floodplain or Wetland Creation – Headwater
- *Measurement Name:* Area of Wetlands Created (Acres); *(Optional)* Direct upland drainage area to the created wetland (Acres), if unknown the default is 1:1 upland acres per acre of created wetland for Headwater and 1.5:1 for Floodplain.
- *Geographic Unit:* Qualifying NEIEN geographies including: Latitude/Longitude; *or* County; *or* Hydrologic Unit Code (HUC12, HUC10, HUC8, HUC6, HUC4); *or* State
- *Date of Implementation:* Year the wetland was created
- *Load Source:* All agricultural load source groups; if none reported

For wetland rehabilitation, once the new recommendations are incorporated into the Model (see Q9 below), jurisdictions should report the following information to NEIEN:

- *BMP Name:* Wetland Rehabilitation
- *Measurement Name:* Area of Wetlands Rehabilitated (Acres); *(Optional)* Direct upland drainage area to the rehabilitated wetland (Acres), if unknown the default is 1:1 upland acres per acre of created wetland for Headwater and 1.5:1 for Floodplain.
- *Geographic Unit:* Qualifying NEIEN geographies including: Latitude/Longitude; *or* County; *or* Hydrologic Unit Code (HUC12, HUC10, HUC8, HUC6, HUC4); *or* State
- *Date of Implementation:* Year the wetland was rehabilitated
- *Load Source:* Wetland rehabilitation is applied to nontidal wetland land uses (Floodplain or Headwater). Indicate which of these land uses receives the BMP, if known.

Otherwise, the default is Headwater. The efficiency is applied to upland AG load sources by default.

For <u>wetland enhancement</u>, once the new recommendations are incorporated into the Model (see Q9 below), jurisdictions can report the following information to NEIEN but the data will not carry over into progress submissions and cannot be simulated in CAST:

- *BMP Name:* Wetland Enhancement
- *Measurement Name:* Acres of Wetlands enhanced (Acres)
- *Geographic Unit:* Qualifying NEIEN geographies including: Latitude/Longitude; <u>or</u> County; <u>or</u> Hydrologic Unit Code (HUC12, HUC10, HUC8, HUC6, HUC4); <u>or</u> State
- *Date of Implementation:* Year the wetland was enhanced

Q5. Are the Wetland Creation and Wetland Rehabilitation BMPs annual or cumulative?

A5. The Wetland Creation and Wetland Rehabilitation BMPs are both cumulative, which means that the acres reported in a previous year carry over into the next year until the credit duration expires.

Q6. What is the credit duration for the Wetland Creation and Wetland Rehabilitation BMPs in the Model?

A6. The existing credit duration for both BMPs is 15 years.

Q.7 How will practices in the NEIEN appendix map to the proposed Phase 6 BMPs once they are in?

A7. A crosswalk between the BMPs in the Phase 5 NEIEN appendix and the Phase 6 BMPs are summarized in Table B-5.

Table C5. Summary of how BMPs currently mapped to wetlands BMPs will translate to amended Phase 6 wetland BMPs, as proposed, once incorporated into NEIEN and CAST

BMP in current Phase 6 NEIEN appendix	Associated FSA or NRCS practice code, if applicable	Current wetland BMP associated with the NEIEN BMP within CAST	Proposed wetland BMP mapping to CAST when panel recommendations incorporated into model
CREP Wetland Restoration	CP23, 327, 657	Wetland Restoration Floodplain or Wetland Restoration Headwater	Wetland Restoration Floodplain or Wetland Restoration Headwater
Wetland and Buffer Restoration, Wetland Restoration		N/A	N/A
Wetland Buffer		N/A	N/A
Wetland Creation	658	Wetland Creation (Floodplain or Headwater)	Wetland Creation (Floodplain or Headwater)
Wetland Functional Gains - Enhanced	659*	Wetland Enhancement	N/A

		Wetland Creation (Floodplain or Headwater)	Wetland Creation (Floodplain or Headwater)
Wetland [Acreage] Gains - Established	658	Wetland Creation (Floodplain or Headwater)	Wetland Creation (Floodplain or Headwater)
Wetland [Acreage] Gains - Reestablished	657	Wetland Restoration	Wetland Restoration
Wetland Restoration	657	Wetland Restoration	Wetland Restoration
Wetland Rehabilitation	657**	Wetland Rehabilitation	Wetland Rehabilitation

*Acres of NRCS 659 do not automatically map to Wetland Enhancement.
**NRCS Practice 657 includes re-establishment (restoration) and rehabilitation, as defined for CBP modeling purposes.

Q8. Are these practices eligible in tidal areas? How should jurisdictions report Wetland BMPs on tidal wetlands?

A8. Implementation of wetland practices in tidal areas cannot be credited using the nontidal wetland BMP definitions and efficiency values. As explained in WEP (2016), implementation of Wetland Restoration or other eligible wetland BMPs in tidal areas can be reported under the existing protocols (protocols 2-4, NOT protocol 1) for the Shoreline Management BMP. The Shoreline Management BMP is simulated as a load reduction per acre, as summarized in Table B-6 below.

Table B-6. Summary of load reductions from Shoreline Management Expert Panel Protocols 2, 3 and 4

Shoreline Management Protocol		TN	TP	Sediment
Protocol 2 – Denitrification	Acres of re-vegetation	85	NA	NA
Protocol 3 - Sedimentation	Acres of re-vegetation	NA	5.289	6,959
Protocol 4 – Marsh Redfield Ratio	Acres of re-vegetation	6.83	0.3	NA
Tidal wetland restoration		91.83 lbs/ac	5.589 lbs/ac	6,959 lbs/ac

Q9. When will the panel's recommended changes to Creation, Rehabilitation and Enhancement be incorporated into the Watershed Model, CAST and NEIEN?

A9. The partnership has agreed to incorporate new/revised data inputs or BMPs following a certain schedule that aligns with jurisdictions' development of 2-year milestones. The most recent deadline for new BMPs or data inputs passed in April 2019; the next opportunity to incorporate the panel's recommended changes to wetland creation, rehabilitation and enhancement will be in 2021, when the model is updated for 2022-2023 milestones.