Appendix C: Technical Requirements to Enter Wetland Restoration BMP into Scenario Builder

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 must work with CBPO staff and the Watershed Technical Workgroup (WTWG) to develop a technical appendix for each expert panel report. The purpose of this technical appendix is to describe how the Wetlands Expert Panel's recommendations will be integrated into the Chesapeake Bay Program's modeling tools including NEIEN, Scenario Builder and the Watershed Model.

Technical Requirements for Reporting and Crediting Wetland BMPs

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

A1. The Wetlands Expert Panel defined four categories of wetland BMPs recommended for incorporation into the Chesapeake Bay Program (CBP) partnership's Phase 6 Chesapeake Bay Watershed Model (CBWM).

Table C1. Proposed categories for wetland BMPs in the Chesapeake Bay Program's Phase 6 Chesapeake Bay Watershed Model.

BMP Category	**Proposed CBP Definition (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. 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 C2. Summary of Wetland BMP simulation in the Phase 6 CBWM.

BMP Category	**Land Use Conversion**	**Treatment of Upland Acres**
Restoration*	YES	YES – based on physiographic region (Table C3)
Creation**	YES	YES – 1 upland acre per acre of created wetland
Enhancement**	NO	YES – 1 upland acre treated per acre of created wetland
Rehabilitation**	NO	YES – 1 upland acre treated per acre of created wetland

*The efficiency values and the upland acres for Phase 6 Wetland Restoration are based on the Wetland Expert Panel's recommendations for the Restoration practice, summarized in Table C3.

**The efficiency value for these practices is based on the current Phase 5 approach for Wetland Restoration and are summarized in Table C4. A future panel can recommend different ratios and efficiency values based on their evaluation of the science and the expected performance of these practices.

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 C3 and C4.

Table C3. Summary of upland acres treated by each acre of wetland, by wetland type and physiographic subregion.

		Upland Acres Treated		Watershed Model HGMR
Wetland BMP Category	**Physiographic Subregion**	**Other Wetlands**	**Floodplain Wetlands**	
Restoration	Appalachian Plateau	1	2	Appalachian Plateau Siliciclastic
	Appalachian Ridge and Valley	1	2	Valley and Ridge Siliciclastic
	Blue Ridge	2	3	Blue Ridge
	Piedmont	2	3	Piedmont Crystalline Mesozoic Lowlands
	Inner Coastal Plain	4	6	Western Shore: Coastal Plain Uplands Coastal Plain Dissected Uplands
	Outer Coastal Plain-Poorly Drained	1	2	Eastern Shore: Coastal Plain Uplands
	Outer Coastal Plain-Well Drained	2	3	Eastern Shore: Coastal Plain Dissected Uplands
	Coastal Plain Lowland	2	3	Coastal Plain Lowlands
	Karst Terrain	2	3	Piedmont Carbonate Valley and Ridge Carbonate Appalachian Plateau Carbonate
Creation	N/A	1	1	N/A
Enhancement	N/A	1	1	N/A
Rehabilitation	N/A	1	1	N/A

Table C4. Summary of proposed upland treatment efficiencies for wetland BMPs in the Phase 6 calibration.

Wetland BMP Category	**Reduction Efficiency**		
	TN	**TP**	**TSS**
Restoration*	42	40	31
Creation**	16.75	32.18	9.82
Enhancement**	16.75	32.18	9.82
Rehabilitation**	16.75	32.18	9.82

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.
*The efficiency values and the upland acres for Phase 6 Wetland Restoration are based on the Wetland Expert Panel's recommendations for the Restoration practice. This is a change from the Phase 5 approach which assumed 1 upland acre treated per acre of implementation, and applied the efficiency rates summarized in the other rows.
**The efficiency value for these practices will treat one upland acre for each acre of created, enhanced or rehabilitated wetlands. This is based on the current Phase 5 approach for Wetland Restoration. A future panel can recommend different ratios. Furthermore, the efficiency values are equal to the average Phase 5 TN, TP and TSS values applied to upland acres for these practices. A future panel can also recommend different efficiency values based on their evaluation of the science and the expected performance of these practices.

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

A4. For wetland BMPs, jurisdictions should report the following information to NEIEN:

- *BMP Name:* Practice Name (i.e. Wetland Restoration)
- *Measurement Name:* Acres of Wetlands Restored/Enhance/Rehabilitated/Created (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/enhanced/rehabilitated/created
- *Land Uses:* All agricultural land uses and land use groups for Wetland Restoration and Wetland Creation. Wetland Enhancement and Wetland Rehabilitation are applied to the two nontidal wetland land uses: Floodplain and Other.

Q5. Is Wetland Restoration an annual or cumulative BMP?

A5. The credit of this BMP is cumulative, which means that the acres reported in a previous year carry over into the next year.

Q6. What is the credit duration for the Wetland Restoration BMP in the Model?

A6. The suggested BMP credit duration is 15 years.

Q.7 How will Phase 5 wetland restoration BMPs map to the new, Phase 6 BMPs?

A7. A crosswalk between the BMPs in the Phase 5 NEIEN appendix and the Phase 6 BMPs are summarized in Table C5.

Table C5. Summary of how BMPs currently mapped to Phase 5 Wetland Restoration BMP will translate to Phase 6 wetland BMPs

BMP in current Phase 5 NEIEN appendix	**Associated FSA or NRCS practice code, if applicable**	**Suggested wetland BMP using Phase 6 BMP definitions**
CREP Wetland Restoration	CP23, 327, 657	Wetland Restoration
Wetland and Buffer Restoration, Wetland Restoration		N/A
Wetland Buffer		N/A
Wetland Creation	658	Wetland Creation
Wetland Functional Gains - Enhanced	659	Wetland Enhancement
Wetland [Acreage] Gains - Established	658	Wetland Creation
Wetland [Acreage] Gains - Reestablished	657	Wetland Restoration
Wetland Restoration	657	Wetland Restoration
N/A		Wetland Rehabilitation

Q8. How should jurisdictions report Wetland BMPs on tidal wetlands?

A8. For Wetland Restoration or other wetland BMPs in tidal areas, the implementation 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 C6 below.

Table C6. 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