Chesapeake Bay Program Partnership BMP Verification Review Panel's Guidance and Recommendations to the Six Source Sector Workgroups, the CBP BMP Verification Committee, and the Seven Watershed Jurisdictions

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The Chesapeake Bay Program (CBP) Partnership's BMP Verification Review Panel (Panel) is providing the following guidance and recommendations based on its reviews to date of the six source sector workgroups' draft BMP verification protocols and the July 15, 2013 draft basinwide BMP verification framework document. The Panel's guidance and recommendations are directed towards the following groups within the larger Partnership:

- The six source sector workgroups—Agriculture, Forestry, Stormwater, Wastewater Treatment, Streams, and Wetlands—to provide them with guidance as they finish their work on their current draft BMP verification protocols;

- To the seven watershed jurisdictions to assist each of them as they build on their existing BMP tracking and reporting programs and enhance them to address the challenge of ensuring all reported practices are implemented and operating correctly; and

- To the BMP Verification Committee, providing them with the Panel's recommendations for addressing several elements of the larger basinwide BMP verification framework.

Keep the Focus on Verification Which Supports Effective Implementation

Through the adoption of its set of five BMP verification principles, the CBP Partnership has already clearly established its intentions by defining verification as:

> "the process through which agency partners ensure practices, treatments, and technologies resulting in reductions of nitrogen, phosphorus, and/or sediment pollutant loads are implemented and operating correctly."

The Panel strongly recommends the workgroups, the committee, and the jurisdictions keep in mind that the Partnership has a clear, working definition of what constitutes "verification".

Also recall that the Partnership recognized in the same principles document that "working to verify that practices are properly designed, installed, and maintained over time is a critical and integral component of transparent, cost efficient, and pollutant reduction effective program implementation."

Guidance and Recommendations to the Six Workgroups

Workgroups: You Provide Guidance, Jurisdictions Develop Protocols. To date, the six workgroups have been writing BMP verification 'protocols.' The Panel believes the seven watershed jurisdictions, not the workgroups, will have the challenge in spelling out the detailed protocols—specific, step by step 'how to' descriptions of conducting verification of practices—within their respective quality assurance plans. The workgroups have the responsibility for providing the jurisdictions with their best professional judgments about the level and type of inspections, surveys, or other verification techniques which will provide a robust level of confidence that the reported best management practices have been installed and are operating correctly. The Panel asks each workgroup to please re-label their existing draft protocols as guidance when finalized.

Workgroups: Use the Urban Stormwater Workgroup Narrative as a Model to Follow. The Panel believes the Urban Stormwater Workgroup's draft protocol narrative provides the right level of detail, content, and format of documentation, including very descriptive rationales, needed to walk a reader through what needs to be considered, why, and how in developing more specific verification protocols. The Panel recommends the other five workgroups work to adopt the strengths of the Urban Stormwater Workgroup's draft protocol narrative into their final guidance documents. The Panel also recommends full consideration be given to organizing each workgroup's guidance by practices being implemented through regulatory programs, practices that are cost-shared, and practices that are non cost-shared.

Workgroups: Use the Verification Program Design Matrix in Developing Your Guidance. The Chesapeake Bay Program BMP Verification Program Design Matrix (*Attachment A*) illustrates the Panel's thinking about the components, elements, and element options for designing the jurisdictions' BMP verification programs. The source sector workgroups should also consider using the series of program elements, stated in the matrix as questions, to confirm their guidance is providing the jurisdictions with as many answers to these questions as appropriate and possible.

Workgroup: Consider these 14-steps when Developing Your Verification Guidance. The Panel recommends each workgroup review the 14 development considerations and questions (*Attachment B*), which prompt specific decisions by the jurisdictions as they work to enhance their current BMP tracking and reporting programs to include verification. Workgroups should ensure that the jurisdictions can use the workgroup's guidance to help work through the 14-steps and answer the applicable questions.

Workgroups: Use the State Protocol Components Checklist. The Panel recommends the workgroups use the state protocol components checklist (*Attachment C*) to help ensure their respective BMP verification guidance provides the jurisdictions with the information they will need to develop their more detailed BMP verification protocols.

Workgroups/Verification Committee: Additional Submission Documents for Protocol Approval. The Panel believes clearly articulated jurisdictional verification protocols should not require substantial additional information. The Panel also believes that the source sector-specific submission documentation should be similar between sectors within a jurisdiction. Therefore,

the Panel recommends that the workgroups develop guidance if they determine the jurisdictions will need to provide any addition documentation along with the submittal of their source sector specific verification protocols. For these cases, the Verification Committee may want to review existing draft jurisdictions' quality assurance plans documentation requirements (see Section 13 Jurisdictional BMP Verification Documentation Expectations in the July 15, 2013 draft basinwide framework document) and/or develop what is to be submitted with the state's sector protocols and the approval process or signoff requirements for submission and approval.

Workgroups: Consider the Panel's Comments on Your Draft Protocols. The Panel reviewed each workgroup's June 2013 draft BMP verification protocols during the Panel's August 28-29 Panel meeting. Each workgroup should fully consider the bulleted comments from Panel members (*Attachment D*) as the workgroup transitions its draft BMP verification protocol into final guidance.

Workgroups/Jurisdictions: Group Practices and Verification Options Together. The Panel recommends grouping BMPs and providing common verification guidance for related sets of practices.

Workgroups: Aim High. The Panel challenges the workgroups to provide their recommendations on "robust" levels of inspection and corresponding schedules for verifying their source sector's suite of practices, treatments, and technologies. The Panel is seeking the workgroups' best professional judgment about the types and frequency of inspection which are needed to provide a high level of confidence that the BMPs are truly installed and operating to meet the assigned removal efficiencies..

Workgroups: Define How to Verify and at What Frequency. The Panel recognizes that the six workgroups have the technical expertise to provide the jurisdictions with guidance on how to best verify individual or groups of practices, using what suite of possible techniques, and what frequency. The Panel asks that the workgroups provide their best expert advice to the jurisdictions on the appropriate verification systems/methods and frequency of inspection.

Workgroups: Address Inspection Frequency for Functional Equivalents. In the case of verifying functionally equivalent practices, the Panel asks the workgroups to provide the jurisdictions with distinct Functional Equivalent Practice definitions so the practice can be reliably identified and reported. Workgroups may need to consider guidance on more frequent inspections to confirm continued presence and functionality over shorter life spans depending on the functional equivalent definition and assigned lifespan.

Workgroups: Provide Guidance on Intensity of Verification Choices. The Panel asks that the workgroups provide the jurisdictions with guidance on seeking more periodic statistical survey-based (e.g., more intensive spot-checks) verification if jurisdictions make the choice not to undertake more site-specific verification up-front (e.g., the jurisdiction initially depended on self certification).

Workgroups: Confirm Cross-Walks between CBP BMPs and NRCS/State BMP Practice Design Definitions/Standards. The Panel recommends each workgroup either develop new or

confirm the validity of the cross-walks between existing NEIEN-based CBP approved BMP definitions and the state reported BMPs based on NRCS/state practice definitions/standards to assure the CBP applied BMP efficiency/land use change is correct.

Workgroups (and the Committee and Jurisdictions): Establish Practice Life Spans and Use within Verification Guidance/Protocols/Programs. The Panel does support continued crediting of a practice after its recorded lifespan as long as the proper level of re-verification occurs confirming the practice is still present and functioning. The Panel recommends the following steps be taken in factoring practice life spans into the **workgroup's** BMP verification guidance, the **Committee's** basinwide framework, and the **jurisdictions'** BMP verification programs:

- For the existing Chesapeake Bay Program Partnership approved BMPs, the respective source sector **workgroup** needs to assign a life span/expiration date for each approved BMP. In doing so, the workgroups need to consider contract/permit life span, engineering design life span, and actual life span.
- For all future BMP expert panels convened by the Chesapeake Bay Program Partnership, the **workgroups** need to ensure each panel is charged with establishing a recommended life span/expiration date for each of the practices at which time them must be re-verified or be removed from the data submitted for crediting.
- **Workgroups** need to develop specific guidance for how to sunset specific reported practices which have gone beyond their lifespan and have not received the level of required re-verification after the designated lifespan and the **jurisdictions** need to build systems for carrying this out within the larger verification programs.
- The **Committee** needs to develop specific guidance that ensures the Chesapeake Bay Program Partnership's NEIEN-based BMP reporting system specifically addresses the issue of practice life span, including building in a system for flagging reported practices which are past their established life spans, and confirmation there was follow up re-verification of their continued presence and functional or removal from the data submitted for crediting.

Workgroups/Jurisdictions: As BMP implementation strategies, products, and technologies develop, workgroups and jurisdictions may be able to change the method used to verify practice implementation. For example as satellite and remote sensing techniques continue develop, the accuracy of their use as compared with on the ground inspection will increase.

Guidance and Recommendations to the Seven Jurisdictions

Jurisdictions: Use the Verification Program Design Matrix in Developing Your Program. The Panel envisions the jurisdictions using the BMP Verification Program Design Matrix (*Attachment A*) to structure their BMP verification programs, using the series of program elements as a series of prompts to ensure they have fully considered everything needed to be documented in their individual BMP verification protocols.

Jurisdictions: Consider these 14 Development Decisions steps when Creating Your Verification Program. The Panel recommends each jurisdiction walk through the 14 steps and questions (*Attachment B*) prompting specific decisions along the way as they work to enhance their current BMP tracking and reporting programs to include verification.

Jurisdictions: Use the State Protocol Components Checklist. The Panel plans to evaluate the jurisdictions' BMP verification programs and their underlying BMP verification protocols using the state protocol components checklist (*Attachment C*). The Panel recommends the jurisdictions use this checklist to ensure their individual verification protocols include all the necessary components as appropriate. The final state protocols should be reviewed to make sure they meet the intent of the five Verification Principles.

Jurisdictions: Address Certification/Training of Verifiers in Your Programs. The Panel recommends each jurisdiction clearly document the certification and training requirements for those personnel involved in all the steps of the verification program. The Panel recommends jurisdictions:

- Describe the required qualifications/certification for the personnel who are carrying out the various elements of the jurisdiction's verification program;
- Ensure certification/training programs are in place for those individuals involved in verification and data entry to assure individuals are qualified to do either task;

Jurisdictions: Aim High or Explain Why. The Panel asks jurisdictions to adopt the "robust" levels of verification described in the respective workgroups' guidance or explain in their quality assurance plan why they cannot, recognizing the legal as well as funding issues that may impede high levels of verification.

Jurisdictions: Prioritize Verification Towards Priority Practices. Jurisdictions should feel empowered to target their verification programs and most robust verification protocols towards those practices on which the jurisdictions' are depending on the most to achieve the nutrient and sediment pollutant loads reductions through their Watershed Implementation Plans (WIPs). For verification of lower priority practices, jurisdictions can rely on less intensive methods of verification. Specifically, statistical sampling methods can be considered if there is a large BMP population and the jurisdiction is able to reliably extrapolate findings rather than visit every site.

Jurisdictions/Workgroups: Robust Upfront Verification Yields Less Intensive Follow up Reviews. The more intense the on-site review of a specific practice (i.e., in person review vs. a paper review), the less intense the required follow up spot-checking will be after the fact. For example, if a BMP has been visually reviewed in the field, a less rigorous sample may be needed for evaluating continued BMP functionality into the future.

Jurisdictions: Understand the Basis on which the Panel will Evaluate Your Draft Verification Program. The Panel intends to refer to following source materials during its review of the seven jurisdictions' BMP verification programs:

- The Chesapeake Bay Program Partnership's five BMP verification principles;

- The six source sector workgroups' sets of BMP verification guidance;
- The checklists and matrix provided in the Panel's November 2013 guidance and recommendations; and
- The Chesapeake Bay Program Partnership's final published basinwide BMP verification framework document.

The Panel strongly encourages jurisdictions to ensure their proposed verification programs are consistent with the principles and guidance agreed to and adopted by the CBP Partnership through the Principals' Staff Committee.

Jurisdictions: Build in time for Continuous Improvement Early. The Panel recommends more intensive review of new verification systems early in their initial implementation to adjust for unforeseen outcomes of the selected system design. It is not unusual to have to make adjustments to the protocols, personnel, documentation tools/electronic systems implementation and use. The more a system is tested prior to full scale implementation, the better the protocol implementation outcomes and protocol accuracy will be.

Guidance and Recommendations to the BMP Verification Committee

Committee: Ensure Adoption of Consistent Nomenclature and Accepted Definitions. The Panel recommends the Partnership as a whole adopt and use the following definitions in all its individual partners' and collective programmatic descriptions and documentation of verification, particularly in place of the terms like "third party". Each of these terms has significant implications when they are used in verification guidance and protocols, each carrying with it time and resource investment implications. The use of the terms "independent" and "external independent" and parts of the wording for the definitions below were drawn directly from publications on the topic of peer review authored by the National Research Council, the U.S. Army Corps of Engineers, and the U.S. Environmental Protection Agency.

> Independent Review: a review carried out by someone within the same organization having technical expertise in the subject matter to a degree at least equivalent to that needed for the original work, but who was not involved as a participant, supervisor, technical reviewer, or advisor in the development or operations of the program/practice under review.
>
> External Independent Review: a review carried out by a separate outside organization with technical expertise in the subject matter to a degree at least equivalent to that needed for the original work. Generally, this level of review is sought when considering key decisions that are being made that could affect overall programs.

Committee: Seek to Strengthen Ability to Verify CBP Defined BMPs. To date, the Partnership's process for developing, reviewing, and approving BMPs has never directly incorporated consideration of verification. The focus has been on nutrient and sediment reduction efficiencies, how to track and report BMPs, and how to credit the estimated nutrient and sediment load reduction capabilities of BMPs through one of the Partnership's Bay models. In order to verify practices have been implemented and are operating correctly, this means the

verifier must have distinct BMP definitions/standards in hand so that the BMP may be reliability reported with using the approved verification method. Therefore, in addition to relying on existing standards like NRCS conservation practice standards, the Panel recommends the Partnership needs to build into its BMP protocol process assistance from its future expert panels in providing distinct practice definitions which incorporate descriptive elements which can be checked by anyone involved in the verification process and result in similar verification findings.

Committee: Further Strengthen Commitment to Transparency. The Panel invested significant time discussing and considering how to ensure the Partnership's commitment to transparency was, in fact, transparent.

The Panel recommends the following changes in the word choices for the final version of the transparency addendum to the BMP verification principles:

> "The measure of transparency will be applied to three primary areas of verification: data collection, data **validation** ~~synthesis~~ and data reporting."
>
> "Transparency of the process of data collection must incorporate **clearly defined** ~~independent~~ QA/QC procedures, which may be implemented by the data-collecting agency or by an independent **external** ~~third~~ party."
>
> "Transparency of the data reported should be transparent at the **most site-specific** ~~finest possible~~ scale that conforms with legal and programmatic constraints, and at a scale compatible with data input for the Chesapeake Bay Program partnership modeling tools."

The Panel recommends that aggregated data can be used, be considered validated, be provided to the public, and still be considered consistent with the Partnership's transparency principle if there is independent verification/validation of the underlying data.

The Panel recommends adding the following recommendation to Section 15 of the July 15, 2013 draft basinwide BMP verification framework document:

> "All practice and treatment data reported for crediting of nutrient and sediment pollutant load reductions and used in some form by the Chesapeake Bay Program Partnership in accounting for implementation progress should be made publically accessible through the Partnership's Chesapeake Stat website. Conforming with legal and programmatic constraints, the reported practice and treatment data should be publically available to at the most site-specific scales, in order of preference: site-level, followed by subwatershed, municipality, county, and then state."

Committee: Provide Functional Equivalency Guidance. The Panel recommends the Committee provide the jurisdictions with clear guidance on how to best go about setting up specific verification methods for the crediting of non-cost shared practices as functionally equivalent. This will require establishing distinct practice standards and accepted practice definitions and the review and connection to existing CBP definitions and efficiencies or the

creation of new expert panels to develop the appropriate credit for functional equivalents in the CBP Partnership's models and decision support tools.

Committee: Treat Cost-Shared and Non Cost-Shared Practices the Same in Terms of Applying Privacy Restrictions. The Panel recommends the Partnership allow for the same privacy protections provided to cost shared data for non-cost shared data not associated with a regulated entity. This means the partners would follow the same privacy and aggregation requirements, for example, under Section 1619 of the Farm Bill for both cost shared and non cost-shared reported agriculture conservation practices.

Committee: Provide Partners with Access to Statistical Design Expertise. The Panel recommends adding the following recommendation to Section 15 of the July 15, 2013 draft basinwide BMP verification framework document:

> "The Chesapeake Bay Program Partnership will develop, fund, and maintain a long term mechanism through which the seven watershed jurisdictions can directly access statistical survey design experts and expertise in support of continued implementation and adaptation of their verification programs."

Committee (and Jurisdictions): The Panel recommends the Partnership work with its Scientific and Technical Advisory Committee to develop and implement a the longer term process of collecting, analyzing, and then using scientific evidence that will assist in quantifying the performance of the individual and collective reported BMPs. Analyses of such data would focus on evaluating the degree of consistency with the pollutant load reduction efficiency adopted by the CBP Partnership and estimated pollutant reductions simulated by the Chesapeake Bay Program Partnership's suite of models and other decision support tools. Applying the results of these analyses, following an adaptive management process, can help the CBP partners refine BMP efficiencies, jurisdictional policy decisions, and support continued research and development into new BMPs. This is not recommended as a required program component of a jurisdiction's verification protocol, but based on jurisdictional and larger Partnership ability to collect this data, and further work by outside experts, the findings could assist in the confirming the accuracy of the existing BMP efficiencies and CBP Partnership's Chesapeake Bay watershed model predictions. Monitoring and a certain amount of performance checks may be required for each jurisdiction to collect adequate data for determining actual BMP performance.

ATTACHMENT A

Chesapeake Bay Program Best Management Practice Verification Program Design Matrix

The Matrix should be used to guide development of both the six source sector workgroups' BMP verification guidance as well as the seven jurisdictions' BMP verification programs.

The Matrix includes three columns that contain program components and elements along with an initial listing of element options for designing BMP verification programs.

A. Program Component. This column contains the three main parts of a comprehensive jurisdictional BMP verification program**:**

i) BMP Verification—Step #1 in the verification process is where a BMP is determined to be implemented and operating correctly.

ii) BMP Data Validation—Step #2 in the verification process is to determine if the data was collected, compiled, and submitted per Chesapeake Bay Program guidance.

iii) BMP Performance—Step #3 in the longer term process of collecting, analyzing, and then using scientific evidence that will assist in quantifying the performance of the individual and collective reported BMPs and the degree of consistency with the pollutant load reduction efficiency adopted by the CBP Partnership and estimated pollutant reductions simulated by the Chesapeake Bay Program Partnership's suite of models and other decision support tools. Applying the results of these analyses, following an adaptive management process, can help the CBP partners refine BMP efficiencies, jurisdictional policy decisions, and support continued research and development into new BMPs. <u>This is not a required program component</u> of a jurisdiction's verification protocol, but based on jurisdictional ability to collect this data, and further work by outside experts, the findings could assist in the confirming the accuracy of the existing BMP efficiencies and Chesapeake Bay watershed model predictions. Monitoring and a certain amount of performance checks may be required for each jurisdiction to collect adequate data determining actual BMP performance.

B. Program Elements—This column contains 16 verification program elements, phrased as questions, which jurisdictions must consider when designing their verification program.

C. Program Element Options—This column describes some examples of the options that may be considered to meet each program element, listed in order of most (highest confidence) to least intensive (lowest confidence) checks for BMP verification. There could be numerous sub-element options not listed here depending on the BMP type and data collection method. Jurisdictions are encouraged to consult the respective source sector workgroup's BMP verification guidance for these additional options. For data validation and BMP performance, the basic and preferred element options are presented.

ATTACHMENT A

Chesapeake Bay Program Best Management Practice Verification Program Design Matrix

A. Program Component	B. Program Elements	C. Program Element Options
i. BMP Verification	1. What was the driver for BMP Installation?	Regulation, Cost-share, Non-cost-share
	2. How many BMPs will be inspected?	All, percentage, subsample, those targeted
	3. How is the frequency and location of inspections determined?	Statistics, targeting, law, available funding
	4. How often are BMPs/groups of BMPs inspected?	Benchmark in BMP implementation timeline, 0-<1 yr, 1yr, 1-3 yr, >5 yrs
	5. What is the method of inspection?	Field visual, aerial, paperwork review, phone/paper survey
	6. Who will conduct the BMP inspection and are the certified/trained?	Regulatory agency, non-regulatory agency, independent party, self-reported
	7. What needs to be recorded for each BMP inspection?	Meets specifications/standards, visual functioning, location
	8. Is execution of the inspection process documented in and checked against an updated quality assurance (QA) plan?	QA plan in place, program checked and amended to ensure compliance, QA plan in place but not actually applied, no QA plan

	9.Into what type of system is collected data entered?	Database, spreadsheet, written files	
	10. At what resolution are results reported out to EPA and/or the public?	Individual practice level, site-level, by sub-watershed, by county, by state	
ii. BMP Data Validation	11. What is the QA/QC process to prevent double-counting or counting of BMPs no longer in place?	BASIC: Database/paper check of adequate statistical sample	PREFERRED: Visual field check of adequate statistical sample
	12. What is the method used to validate state's ability to collect and report correct data?	BASIC: Database/paper check of adequate statistical sample	PREFERRED: Visual field check of adequate statistical sample
	13. If data is provided by external independent party or industry, what method is used to provide adequate quality assurance for acceptance by the Chesapeake Bay Program Partnership?	BASIC: Database/paper check of adequate statistical sample	PREFERRED: Analytical comparison to a know database and review of data collection procedures.
	14. Who conducts data validation?	BASIC: Non-regulatory agency	PREFERRED: Regulatory Agency, independent external party
iii. BMP Performance	15. What is the process to collect data to assess BMP performance and confirm consistency with BMP efficiencies in Chesapeake Bay models?	BASIC: Visual field assessment of statistical sample (check for signs of failure)	PREFERRED: Analytical measurement of performance for a statistical sample (water quality monitoring, soils test, manure sample, etc)
	16. Who collects BMP effectiveness data?	BASIC: Non-regulatory agency, nongovernmental organization	PREFERRED: Regulatory Agency, university

ATTACHMENT B

Jurisdictional BMP Verification Program
Development Decision Steps for Implementation

Below are the 14 steps for each Chesapeake Bay watershed jurisdiction to consider when developing their jurisdiction's BMP verification program. Under each step are questions for consideration which will prompt decisions that may be needed to develop jurisdiction's verification protocols.

1) Determine what BMP's to collect:

a) Do you want to collect all BMPs that were listed to in your jurisdiction's Phase II WIP? Additional/or some other combination of BMPs?
b) Do the listed BMPs meet NRCS standards, state standards, and/or Chesapeake Bay Program (CBP) definitions?
c) Do you want to report BMPs that are considered functionally equivalent (they do not meet NRCS standards, state standards, or CBP definitions but do result in nutrient and/or sediment pollutant load reductions)?
d) When collecting the selected BMPs, do you have the year they were implemented?
e) For reported BMPs, are you collecting all the BMP elements required for the CBP model determination (example: for cover crops, to do you have species, date planted, kill down date, fertilization if any) or will you take the lowest credited efficiency available?
f) Have the selected BMPs been approved by the CBP Partnership? If not, do the BMPs have CBP Partnership provisional acceptance status as an interim BMP?
g) Are the practices you plan to collect worth the cost of collection?

2) Determine where to collect BMP's:

a) Depending on the BMPs you choose to collect, at what level will you report these? (i.e., site specific scale; on a county level; on a (sub-) watershed level, etc.)?
b) Does the whole state need to be canvassed or only certain areas where there is a resource concern or particular practice implementation (i.e., Eastern shore vs. rest of state)?

3) Protocol—How to Collect BMP's:

a) What system/method have you decided to use to collect the BMPs?
b) If the BMP is only present at a certain time of the year (i.e., cover crops, conservation tillage, etc), does your verification method and associated workload requirements take this into account?
c) What is the cost benefit ratio on the system selected (high, medium, low)?
d) Do you have current funding for the BMP collection system selected?
e) Do you plan to collect BMPs in the selected areas only during certain seasons of the year, throughout the fiscal year, or will it take several years to determine if they are properly functioning?
f) Has your selected system been accepted by the people who will be collecting the BMPs—i.e., Conservation Districts, municipalities, state agencies, farm community, special interest groups, NGO's, USDA, EPA, USFWS, or other federal entities?

4) **BMP verification system development:**
   a) What system/method will be used for verification of collected BMPs?
   b) Does it require: trained state or federal employees; other trained specialists; self-certification; or technological expertise (i.e., aerial photograph interpretation)?
   c) Has your selected system been approved by the appropriate workgroup in the CBP Partnership?

5) **Training on selected data collection and verification systems:**
   a) Do you have written guidance and documentation on the data collection and verification systems?
   b) How will you train data collectors and verifiers to use the selected system/method (i.e., in person, webcast, etc.)?
   c) Does your system require independent verification?
   d) Is there a "certification requirement" for anyone who collects data and a follow-up CEU requirement?
   e) Who do the data or verification collectors call if there is a question?

6) **Use of existing electronic data collection system or update/development of new systems:**
   a) Does the electronic data collection and storage system exist for recording BMP implementation, or do you have to build a new one, or make adjustments to the existing system?
   b) What is the cost to develop/updates or create the system and do you have funding?
   c) How long will the system be viable (due to technology or other changes)?
   d) What is the ease of use for the BMP verifiers and data entry personnel?
   e) What is the ease of use for the landowner (if applicable in self certification)?
   f) Where will the data be maintained and is the system secure?
   g) Is the system mapped to provide the data required to NEIEN and to the Chesapeake Bay Program Office?
   h) Who will transmit data?
   i) How will you update the data in the future and remove BMPs that are not being maintained, no longer in use, no longer in existence, or expired?
   j) Does the electronic system have standard reports that can be provided to leadership or others if requested or will someone have to build reports?
   k) Have you taken into account BMPs that may have more than one funding source so that you do not have double counting?
   l) Is the data available to the public? Do you have appropriate FOIA, Section 1619 or other protection needed for the data?

7) **Training on data entry:**
   a) Will the training on the selected data entry system be given by: reading documentation or guidance documents; group training; net meetings; field training; or any combination?
   b) Will there be a "certification" requirement to use the data entry system?
   c) If you are recording initial verification determinations on paper, how to you make sure it is accurately entered into the electronic system?
   d) Will training be required for the landowners (if they are entering data)?
   e) How and when is the best time to conduct the training for data entry personnel?

f) Will there be a "certification" requirement for those who enter data?

8) Pilot of collection, verification and data entry systems:

a) Where will the state pilot the data collection and verification systems?
b) How long will the pilots(s) take?
c) Who will be involved in the pilot (s)?
d) How will debriefing be conducted to determine pilot success and/or system changes needed after the pilot?

9) Reliability and validity testing of the new system:

a) Reliability assures that every time you ask the data collection question, you get the same answer. How will you test this?
b) Validity is when you compare what you collected to another system of collection, to see if you get the same or a similar answer. How will you test? (Example: looking at the same data in another system like the Chesapeake Bay Program Partnership's Chesapeake Stat web site, USDA's CEAP and NASS data systems, etc.)

10) Adjust systems and training:

a) After testing the systems, how will you implement adjustments you have to make and are there documentation changes, system changes, or re-training all involved, in making the changes?

11) Implement tested and adjusted data collection and verification systems:

a) After you have tested the system you should re-test the adjusted system to make assure you still have adequate reliability and validity of the data.
b) If the tested system changes the use of the system, documentation, output of data, timeline for collection, you may need to re-train all employees.
c) Realize that new systems are very seldom right the "first time" implemented.
d) Allow for the system to operate without continuous changes (usually one year, unless the problem is really significant) for data collection personnel to get used to the system.
b) Set up a system for users to report problems to system designers.

12) Spot Checking Procedures

a) What method is used to select the statistical sample for quality assurance?
b) What documentation is needed for spot check findings?
c) What actions will be taken if problems are found (i.e., additional training, removal or correction of data in system, etc.)

13) Communication Strategy:

d) Do you need to prepare and conduct communication strategies for: the data collection event; landowners; local, state or federal leadership; general public?
e) How will information be provided: written, electronic, news or media public meetings or any combination?
f) Do you want feedback about what you propose to do before you start the process?
g) Will you make changes if you accept feedback?

h) Will there be communication of findings throughout the process or at a specific time in the process?
i) Who does the landowner or general public call if they have questions?
j) Will there be a published document of the findings and outcomes of the collection of BMPs?

14) Future Year Systems: Things to Think About

a) As BMP technologies or the electronic computer systems change, will you be able to change how often you collect and verify data (i.e., moving from on the ground collection to satellite imaging)?
b) Will new technology change how to determine if the practice is still in existence or needs to be re-verified?
c) How will you remove practices from the database that are not being maintained, no longer in existence, or have expired in the future?
d) If you use different systems in the future, have you gone through all of the above steps?

ATTACHMENT C

State Protocol Components Checklist				
	State:			
	Sector:			
	BMP Verification	Present	N/A	Comments
1	**BMP's Collected**			
	Type (Structural, Management, Functional Equivalent, Etc)			
	BMP Funding/Cost shared (Federal, State, NGO, Non-cost shared)			
	Distinct State Standards/Specfications			
	Matching CBP Definition/Efficiencies			
2	**Method/ System of Verification/Assessment**			
	Description of Methods/Systems To Be Used			
	Documentation of procedures used to Verify BMP's			
	Instruction Manual for system users			
3	**Who will complete Verification**			
	Qualification Requirements			
	Training Requirements			
	Certification Requirements			
	CEU Follow-Up Training Requirements in Future			
4	**Documentation of Verification Finding**			
	Date of Installation			
	Location (Lat/Long if applicable)			
	Level of Reporting (Watershed, HUA, County, site specific etc)			
	Units (Number, Acres, Length, etc.) needed for NEIEN			
	Ownership (public, private)			
	Documentation:			
	Pictures			
	Worksheets			
	Electronic Tool			
	Arial Photos			
	Maps			
	Other			

	Report Generator			
5	**How Often Reviewed (Cycle of review)**			
	1-2 Years			
	5 Years			
	10 Years			
	Other			
6	**Independent Verification of Finding**			
	Is this a requirement?			
	Internal Independent			
	External Independent			
	BMP Data Validation			
7	**Quality Assurance/Spot Checking**			
	Who- Qualifications/Training/Certification			
	Method to Select BMP for Spot Check			
	Method to Select the Number of BMP's to Review			
	Other			
8	**Data Entry of BMP Implementation**			
	What is System?			
	Who enters Data (Training/Certification)			
	Does System connect to NEIEN?			
	System in Place prevent Double Counting			
9	External Provided Data Validation meeting CBP Guidance			
	Method to validate data			
	Who will validate data- certification/training?			
10	**Historic Data Verification**			
	System to re-certify or Remove			
	Who (training/certification)			
	Documentation of Action			
	BMP Performance			
11	Does state collect data to assess BMP Performance?			
	System Used to collect BMP performance data?			

	Who collects BMP performance data?			
	Who Analyses collected data and report to CBP?			
12	**Additional Comments/Requests**			
13	**CBP Approval Process: (TBD)**			

Jurisdictional Assurance that Protocols Meets Five Verification Principles:

1) Practice Reporting

2) Scientific Rigor

3) Public Confidence

4) Adaptive Management

5) Sector Equity

ATTACHMENT D

Chesapeake Bay Program Partnership's BMP Verification Review Panel Feedback to the Workgroups on their June 2013 Draft BMP Verification Protocols

The following is the cumulative feedback from the Panel to directed back to the respective workgroups' chairs and coordinators coming out of the Panel's August 28-29, 2013 meeting. The complete summary of the August Panel meeting is available on-line at: http://www.chesapeakebay.net/S=0/calendar/event/20832/.

Agriculture Workgroup

- Need to be clear up front exactly who is the audience of the Agriculture Workgroup's protocol—the public or the states—and write the supporting narrative with that target audience in mind.
- The matrix is very difficult, if not impossible to fully understand and comprehend.
- The use of checks, x's and question marks in the matrix was very confusing.
- The Workgroup should consider should consider breaking up the single matrix into four separate tables as opposed to attempting to include everything into a single table.
- Still need clarify on what exactly is the 80 percent threshold and exactly how does it apply?
- Does the 80 percent threshold have to apply to verification of all BMPs?
- Does the 80 percent threshold it apply to all programs or could there be different requirements for more important programs?
- If a state wants to report a practice and demonstrate its underlying verification protocol meets the 80 percent or better threshold, who or what entity will approve their method?
- Need to document just how defensible the 80 percent threshold level is and how practical/achievable it is.
- Did not see clear documentation of specific procedures which yielded an 80 percent or higher threshold in the Tetra Tech documentation.
- Need to provide the documentation necessary so the readers of the Workgroup's guidance fully understand that determining the 80 percentile threshold for a specific verification procedure is not based on a consideration of a set of quantitative criteria, but it is a qualitative evaluation by a still to be define group of experts.
- Need to address concerns about moving away from physical inspections by depending on a qualitative evaluation of a proposed survey techniques which would result in only a sub-sampling of all BMPs.
- Need to incorporate the data and information originally supplied in the relative cost and scientific defensibility columns (which were removed from the matrix) within the supporting narrative document.
- Need to clearly address how to verify functional equivalency.
- If functional equivalency is not defined based on reference back to an established practice standards/specifications, then is could be very subjective. How will the Agriculture Workgroup address this?

- Need to ensure that non-cost-shared practices have specific verification protocols, even though those protocols may be slightly different.
- Need to answer the question as to whether each reported BMP needs to meet the CBP BMP definition? What happens if is meets an NRCS practice standard but not a CBP BMP definition? Same questions for establishing functional equivalency?
- Why has the Agriculture Workgroup not stated up front that NRCS and FSA verification program necessarily meet the Agriculture Workgroup's protocol/CBP Partnership's BMP verification principles—instead suggesting this will likely be the case, but needs to be documented as so by each jurisdiction.
- Need to see actual descriptions of what are the actual inspection procedures similar to the procedures spelled out within the Urban Stormwater Workgroup's draft protocols.
- For most other sectors, those carrying out the verification protocols are not those directly involved in supporting the source sector itself whereas in the agricultural sector, the conservation districts are involved in both delivering services to the producers and conducting the verification procedures. Need to address concerns of how to achieve independency in inspections.
- Provide clear direction in the revised Workgroup's guidance that a state just can't re-submit the Agriculture Workgroup's matrix as their verification program documentation. The guidance should lay out the clear expectation that each state to provide detailed descriptions of their planned inspection/verification procedures for different sets of related practices.
- Need to address concern that the states can't necessarily verify on the basis of the CBP Partnership's adopted BMP definitions—they are not specific enough as NRCS standards are.

Forestry Workgroup

- Address concern about the percentage of forestry operations that are evaluated independently to verify accuracy of data.
- For expanded tree canopy, how do you determine if it's expanded given trees grow slowly? Through remote sensing or through planting data?
- How do you verify that buffers still function, e.g. reasonably uniform flow through buffer rather than channelized flow?
- On page 10 of Appendix J, confused what the four principles bullets are referring to.
- There is much more detail on the agriculture section of the protocol compared to the urban section.
- The first four practices are covered in Urban Stormwater Workgroup or Agriculture Workgroup's protocols—please confirm this is the case, as just want to make sure they are addressed in those protocols.
- Because of dependence on USDA cost share programs for supporting riparian forest buffers, page 13, really need the agriculture community to advise the Forestry Workgroup on the timing of inspections.
- On page 14, the section is marked "optional" when it really should not be considered optional.
- What counts as a professional program on page 7, Appendix J?

- What/who are these local partners and what is required to be defined as a local partner? Is there some level of expected training or professional certification required?
- Who is responsible for the gathering the data that would be used for this verification?
- For urban forest canopy, the Forestry and Urban Stormwater Workgroups need to make sure we are not double counting with urban stormwater verification protocol.
- Who is responsible for reporting the urban forestry practices in urban environments?
- Is verification every 5 years really enough?
- Unclear how data records would be obtained for what is done on private lands (non-cost shared practices).
- Need address concerns about the low frequency and adequacy (staffing) of inspections on private lands.
- Page 14, part 2: enhance appeal for monitoring. Is monitoring after planting 10 years later for determining functionality really being carried out? This section raises more questions than answers.
- If there is a loss of the urban tree canopy, then there is no credit given for those five years and any previous credit is lost (page 11, Appendix J). What is the reasoning behind that approach? Why take away any incentive for maintaining urban tree canopy. Seems a little extreme.
- Recommend the Workgroup consider clarifying the protocol text about removal of credit given specific situations.
- Why not include the agriculture and stormwater-forestry related BMPs in the agriculture or stormwater verification protocols. Could become a double counting issue.
- Was not clear what the actual forest harvesting BMPs were. Recommend adding a more complete list of these practices in the protocol description.

Urban Stormwater Workgroup

- For non-regulated (non-MS4) areas of the watershed, would it be valuable to distinguish between areas with high growth and low-growth?
- In the definitions, there is definitions for "'non-regulated" and "semi-regulated". Text refers to "semi-regulated" and "regulated", but did not see the non-regulated areas addressed.
- On what period would the sub-sampling be done for the non-regulated stormwater on Option 2?
- Would like to see a statistical sampling conducted more often, rather waiting for a more comprehensive evaluation of the entire population every 10 years.
- On page 20, treatment train of BMPs – how are they credited?
- Have no issue with inspections every 9-10 years. However, would emphasize the need for first year inspection of low impact development or LID practices.
- Would like to see emphasis on local jurisdictions' inspections of runoff reduction BMPs and stormwater retention practices every 3 years.
- Should we encourage a basin-wide version of Maryland's StormwaterPrint that could serve as basin-wide database for stormwater BMPs.
- For option 3, seems like bad idea to apply a subsample to other regions.
- Don't know if we are giving credit for legacy BMPs, but if we are crediting them, do we remove or reduce them?

- In stormwater programs for new and redevelopment, there are multiple inspections throughout the construction period and a final inspection upon completion, all which are not described in the protocol. In MS4 areas, there are inspections done every permit cycle. Provide documentation of the presence of all these inspections.
- Address recommendation that LID practices should be inspected annually.
- The Workgroup needs to revise option 3 on page 25 in terms of the low bar it sets.
- Confirm that is a BMP that is not inspected/verified should not be reported and credited—that was the basis for option 4 on page 25.
- Is it worth making a distinction between these voluntary BMPs and required BMPs if they are both implemented in stormwater regulated areas?

Wastewater Treatment Workgroup

- The reference to 'non-significant facilities' is a typo on first page (page 28)—please correct this.
- Document within the Workgroup's guidance that the NPDES system works only if there are numerical nutrient limits in the permit.
- Please clarify in the text that West Virginia does not have on-site treatment systems regulations in place, but the jurisdiction will follow the protocol for the verification of advanced treatment systems. Only three jurisdictions—Delaware, Maryland, and Virginia—have on-site treatment system programs/regulations in place right now.
- Add into the Workgroup's revised guidance the expert panel recommendations on inspection frequencies for on-site treatment systems.
- Need to make it much clearer on page 30 the on-site treatment system verification will focus on nitrogen-reducing treatment systems that are reported for load reduction credit.
- Need to address verification of septic system pumping in the protocol—without verification, no credit should be given.
- Need to address concerns raised concerns about the physical size of the on-site systems and whether that needs to be more specifically addressed in the protocol. Regulation of large systems varies by state, e.g., VA has VPDES requirements for systems above a certain volume.

Streams Workgroup

- There is nothing in the protocol that ties restoration and the stream to the surrounding watershed? Should there be?
- Need to provide clear documentation on the basis for the 25 year storm cutoff.
- Does this protocol apply to every stream restoration project earning credit?
- Who conducts the inspections?
- The draft protocol relies heavily on the function based stream assessments—what's timing for the underlying source publication and how well do the assessments align with data requested by the CBP?
- What is being described here is not really adaptive management (number 5 on page 42).
- The draft protocol seems to rely on function based stream assessments that are still under development: what's the status of the function based stream assessment framework.
- Need to address concerns that there is overlap between wetlands and stream restoration verification protocols.

- Need to document who is responsible for post-project monitoring.
- Page 43, number 10 seems to imply there needs to be a process to avoid double-counting, but there currently is no process?
- Suggest including upstream and downstream monitoring, particularly for protocol 4 projects.
- Still very unclear exactly who is responsible for conducting these inspections. There is a great opportunity to standardize the post construction monitoring within the Corps of Engineer's permit for the actual stream restoration project.

Wetlands Workgroup

- What is being described here is not really adaptive management.
- Much of the wetlands protocol references back to the agriculture and urban stormwater protocols so question whether this section is even needed.
- Several sections of the wetlands protocol includes language that cite lack of funds as a reason for likely not carrying out verification—the Panel asks the Workgroup to both remove that specific language and not develop its guidance on a basis of available funding.
- For wetland restoration projects, what percentage falls under government programs? Is there data on non-profit or other projects that could potentially be double-counted?
- Why don't we take the same approach as tree canopy—if we are not getting a net gain in wetlands (or restored streams) at the local level, we should not be giving credit at all.
- Forestry Workgroup suggested using imagery to verify that there is no net loss. Could this work for wetlands?
- Why not use the same protocol for verification for wetlands captured under the agriculture and stormwater sectors for wetlands being restored outside of these two sectors?
- What type of wetlands does the protocol actually apply to?