WTWG NM Report Review

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VT/VADCR

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Tier 1 Non-Visual Assessment

1. Plan is available in electronic or paper format.
2. Plan is developed cooperatively by a trained professional and the farmer.
3. Plan expiration date is no longer than three years after written.
4. Plan uses soil lab analysis from farm samples to inform application rates of nutrients.
5. Plan is implemented and followed according to the CGNAM definition and the intent where:
   - Crop yields are estimated based on records or soil productivity estimates for the entire farm;
   - Nutrient applications adhere to contemporary LGU specifications for N rate;
   - P fertilizers are applied at a rate consistent with the contemporary LGU recommendations; and
   - Nutrient application timing is considered to further reduce N and P losses.

Tier 2 Non-Visual Assessment

Tier 2 includes <u>all</u> elements of a Tier 1 plan, and the enhancements bolded below.

1. Plan uses soil lab analysis from farm samples to inform application rates of nutrients.
   - If soil test levels of P warrant a **P risk assessment (or P-index),** one is performed and the recommendations to reduce losses are followed for the entirety of the plan.
2. Plan is implemented and followed according to the FLNAM definition and the intent where:
   - Crop yields are estimated based on records or soil productivity estimates for **each field** using **contemporary guidelines from state programs**;
   - Nutrient application rates **do not exceed** contemporary LGU specifications for N and **P (including manure)**; and
   - Fertilizer and manure applications are **timed** and placed (e.g., lower risk times for runoff and leaching, setbacks, incorporation, etc.) to reduce risk of N and P loss.

Tier 3 Non-Visual Assessment

Tier 3 includes <u>all</u> elements of a Tier 2 plan, and supplementary records showing either:

1. Variable rate applications of N on each field were performed resulting in a net change in N rates for the field; or
2. An Illinois Soil Nitrogen Test (ISNT), Corn Stalk Nitrate Test (CSNT), Pre-side dress Nitrate Test (PSNT), or Fall Soil Nitrate Test (FSNT) was performed resulting in a net change in N rates for the field.

Q1: What are the efficiency reductions a jurisdiction will be credited for implementing the tiers of Nutrient Application Management for each tier by landuse?

- A1: A jurisdiction can reduce loads from modeled agricultural land uses by percentages listed in the table below. As evident in the table, the efficiencies build upon one another so that, for example, Tier 2 N automatically assumes that practices are in place to achieve Tier 1 phosphorus credit. If the reduction is listed as “NA,” states cannot take credit for the BMP on this land use.

Recommended & final efficiency values

		High-Till with Manure	Low-Till with Manure	High-Till without Manure	Pasture	Hay with Nutrients	Alfalfa	Nursery
Tier 1 Reduction from no NMP	TN	9.25	9.25	5	5	5	5	5
	TP	10	10	8	8	8	8	8
Tier 2 Reduction from no BMP	**TN**	**12.79**	**12.79**	N/A	N/A	**7.6**	N/A	N/A
	TP	**15.94**	**15.94**	N/A	N/A	**14.07**	**14.07**	N/A
Tier 3 Reduction from no BMP	**TN**	**15.23**	**15.23**	N/A	N/A	N/A	N/A	N/A

Q2: Why is there no credit given for Tier 3 Phosphorus Nutrient Application Management?

- A2: At the time of publication of this document, the expert panel has not defined reduction efficiencies for Tier 3 Phosphorus. The Phase 6 expert panel may choose to provide credit for Tier 3 Phosphorus.

Q3: Can jurisdictions still receive credit for the Enhanced Nutrient Application Management and Decision Agriculture BMPs?

- A3: No. The panel recommended retiring Enhanced Nutrient Application Management and Decision Agriculture BMPs. The three tiers of nutrient application management cover on-the-ground concepts of these retired BMPs.

Q4: What combination of Nutrient Application Management practices can be reported on the same acre?

- A4: Only one practice may be submitted on each acre. Tier 2 practice efficiencies already assume that that Tier 1 practices components were followed. Acres should not be submitted multiple times. For example, if an acre qualifies for Tier 2 Nitrogen, that acre should be submitted only under the Tier 2 Nitrogen practice name. The Tier 2 Nitrogen practice already assumes a phosphorus efficiency consistent with Tier 1 practice (i.e. one acre of row crops with manure receiving Tier 2N credit will achieve a load reduction of 12.79% TN and 10% TP). See Table 1 above for a complete listing of the credits available.

Q5: How are the nutrient reductions calculated in Scenario Builder and the Watershed Model?

- A5: Reductions for all types of nutrient application management BMPs are applied as percent reductions of edge-of-stream loads exiting agricultural land uses. Therefore, the impact of these reductions in the Watershed Model will vary across the watershed as a result of hydrologic conditions, application rates to land uses, and nutrient export from land uses.

Q6: What NEIEN data fields does a jurisdiction need to report in order to successfully process Nutrient Application Management BMPs in an annual Progress scenario?

- A6: Jurisdictions should report the following information:
- Nutrient Application Practice Type: Crop Group Nutrient Application Management (Tier 1); Field level Nutrient Application Management Nitrogen (Tier 2N); Field level Nutrient Application Management Phosphorus (Tier 2P); Field level Nutrient Application Management Nitrogen and Phosphorus (Tier 2N&P); Adaptive Nutrient Management (Tier 3N)
- Acres: Number of acres under a nutrient application management plan in the geographic reporting unit
- Land use: Approved NEIEN land uses
- Location: Approved NEIEN geographies: County; County (CBWS Only); Hydrologic Unit Code (HUC12, HUC10, HUC8, HUC6, HUC4), State (CBWS Only)
- Date of Implementation: Year of plan implementation (not necessarily the year the plan was written)

Q7: What data fields does a jurisdiction need to report to successfully process Nutrient Application Management BMPs in a planning scenario?

- A7: Jurisdictions should report the following information:
- Short Name: EffNutMan (Tier 1); EffNutMan2N (Tier 2N); EffNutMan2P (Tier 2P); EffNutMan2NP (Tier 2 N&P); EffNutMan3N
- Acres: Number of acres under a nutrient application management plan in the geographic reporting unit
- Land use: Approved SB land uses listed in Table 1 above
- Location: Approved SB geographies: County; County (CBWS Only); Hydrologic Unit Code (HUC12, HUC10, HUC8, HUC6, HUC4), State (CBWS Only)
- Date of Implementation: Year of plan implementation (not necessarily the year the plan was written)

Q8: Do states need to report all acres under Nutrient Application Management BMPs annually – as opposed to cumulative?

- A8: Yes. Beginning in 2013, states began submitting the total number of acres concurrently under a tier for a given year.

Q9: What is the order of credit for Nutrient Application Management BMPs in Scenario Builder?

- A9: To avoid double-counting on the same acres, the panel recommends that Scenario Builder will process the BMPs in the following order:
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- Tier 3 Nitrogen Nutrient Application Management
- Tier 2 Nitrogen and Phosphorus Nutrient Application Management
- Tier 2 Nitrogen Nutrient Application Management
- Tier 2 Phosphorus Nutrient Application Management
- Tier 1 Nutrient Application Management
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- If there are no agricultural acres available in the geographic reporting unit after a BMP is processed, the next BMP in the processing order will not receive credit.

Q10: When are states eligible to receive credit for each Tier of Nutrient Application Management?

- A10: Jurisdictions may submit Tier 1 Nutrient Application Management starting in 1985. Jurisdictions may submit Tier 2 Nutrient Application Management starting in the year listed in table 3 below based on the years states adopted Tier 2 level nutrient management regulations. Tier 3N Nutrient Application Management eligibility begins the year Tier 2N and Tier 2P were adopted for each state. Please note that this table does not suggest that ALL acres within a state are eligible for this credit after the eligible year, but rather that a subset of acres with qualifying plans may be eligible for credit after the eligible year.

State Eligibility for Tiers of Nutrient Management by Year

State	Tier	Year Eligible
All	**T1**	**1985**
DE	**T2N**	**2007**
DE	**T2P**	**2007**
DE	**T3N**	**2007**
MD	**T2N**	**2005**
MD	**T2P**	**2005**
MD	**T3N**	**2005**
NY	**T2N**	**2004**
NY	**T2P**	**2004**
NY	**T3N**	**2004**
PA	**T2N**	**2006**
PA	**T2P**	**2006**
PA	**T3N**	**2006**
VA	**T2N**	**2006**
VA	**T2P**	**2006**
VA	**T3N**	**2006**
WV	**T2N**	**2011**
WV	**T2P**	**2011**
WV	**T3N**	**2011**

Q11: What specific records, data and documentation does a jurisdiction need to provide to CBPO to ensure acres reported for the annual model progress assessment under Nutrient Application Management meet the definitions of the BMPs and meet all elements of Nutrient Application Management considered by the Panel for their determination of nutrient reductions?

- A11: This information is available in Section 6 under verification recommendations. Basically, implementation years and program elements have been documented for Tier 2N and Tier 2P for each jurisdiction. Plans that exist and are QA/QCd by the documented state programs are eligible to be reported and get credit. These plans are extensive documents that detail prescriptive elements and are where management actions are recorded. The results of these plans contain confidential information and do no exist in a centralized place. As a result of these characteristics, plans are not transmittable in NEIEN. Instead, states should submit acres summarized with the elements detailed above, in this appendix. Additionally, states should describe in their Chesapeake Bay Program Quality Assurance Project Plans (QAPPs) how nutrient management acres are divided between the various tiers for submission.

Q12: If manure incorporation is a component of Nutrient Application Management, will additional model reductions be given to manure incorporation in the Phase 5 Watershed Model?

- A12: No. Because manure incorporation is now a component of Nutrient Application Management, no benefit will be given to manure incorporation in the Phase 5 Watershed Model. Manure incorporation will be considered for separate credit in the Phase 6 CBPWM following the recommendations of a separate Expert Panel.

Q13: How is compliance with Nutrient Application Management plans taken into consideration in the acres submitted through NEIEN for the components of Nutrient Application Management?

- A13: Compliance of farmers to their NMPs is a recognized concern of the partnership, but as of the date this report is submitted for approval, the Panel defers judgment of how to handle compliance rates to the states which run the programs. The Panel recognizes that as a result of CBP Partnership approval of state verification programs that are due to be implemented by January 2018, new details and data will result for which the Phase 6 CBPWM NM EP can deliberate how best to reconcile state verification efforts with compliance rates and reported acres for which credit is given. No existing framework for enhanced oversight and reliable compliance data exists for this panel to give a recommendation that can be reasonably implemented in the time for which these recommendations would be used in the Phase 5 CBPWM, but the Panel does recognize that compliance in not 100% in the watershed. The considerations the Panel made with regards to adjusting literature values includes “management challenges of schedule,” where a reduction in the credit from literature was applied to account in a BPJ way for the plans that are not implemented on every acre of every field.

Q14: How did the panel take into account the various land and crop types in their recommendations of nutrient reductions, i.e., those that are eligible for manure applications; those that only use chemical fertilizer; those crops that aren't fertilized, etc.?

- A14: The recommendations for N and P reductions are related in some part to the rate of manure and fertilizer applications. The framework for the Phase 5 CBPWM lumps all crops that are eligible for manure application together regardless of whether the each acre in that county has manure applied in reality. The reality of following a NMP resulting in less manure and fertilizer N and P lost to the environment was what the Panel's recommendation was based on and so no adjustment for acres unlikely to receive manure was made. The Panel is encouraged by the recommendations of the Agriculture Modeling Subcommitte to the AgWG, which include some land uses of only one crop, and distinct acres that are eligible for manure. These model enhancements will make future NM crediting efforts more straightforward. The panel did adjust literature values based on individual crops by the proportion of those crops to the land use in the efficiency adjustment Table 7, in the report. Furthermore, Tier 2 and Tier 3 eligible landuses were carefully considered and only landuses that would be expected to produce nutrient loss reductions at or above our recommendation were included in the report. Therefore, Tier 1 eligible landuses (i.e., Pasture, nursery, row crops without manure) were not included in the Tiers 2 and 3 recommendations.

Q15: Did the panel consider different species of nitrogen and phosphorus and the different loss pathways when creating total nitrogen and total phosphorus efficiencies?

- A15: The panel meticulously documented the nutrient species that were measured in the literature used to justify the recommendations. Through our deliberations of Tiers 2 and 3, the species of nutrient and the pathways in which the reductions were measured, the Panel determined that the species were conservatively representative of the TN and TP loss prevented by the components. The deliberations revolved around the fact that crops grow most efficiently with the proper application rate, method, timing and source, so any measured reduction in loss of one pathway or nutrient species is consistent with a reduction in prevented nutrient load in the Phase 5 CPBWM. BPJ was used and documented in the management variability adjustments in Table 7 related to measuring one species or pathway perhaps increasing the mass of nutrients lost by a different species or pathway.

Q16. Did the panel consider how varying meteorological and hydrologic conditions affect the literature values were considered?

- A16: The panel adjusted all literature values for scale and management variability, both of which relate to surface and subsurface mobility of nutrients. The BPJ incorporated into the management variability adjustment provided some discounting to literature values for experiments that used rainfall simulators, measuring only runoff or lysimeter studies, measuring only leachate. Additionally, rainfall simulation studies typically applied very heavy rates of rainfall to generate runoff, so that was a consideration made in the BPJ adjustments cataloged and quantified in the efficiency adjustments from literature values. The issue of scale for plot or field size experiments from the literature was considered by the Panel and a universal adjustment was applied to literature values consistent with the Phase 5 CBPWM Cover Crop EP. This is a result of the consideration that the variability in hydrology of a small watershed, like those that are simulated in the Phase 5 CBPWM, are going to contribute to some reduction in the measured effect of a treatment at a field or plot sized scale.

Overarching questions and concerns

- Verification guidance offered in Section 6
- Adjustment to estimates in Table 7 and
- Model considerations on interactions in Appendix A (Technical Appendix).
- Responses to all comments offered in Appendix F
- AgWG resolved to fwd Tier 2 and 3 for nitrogen and defer consensus on Tier 2 P.
  - Also establishing review team for State's programs

Process

- July 1 webinar available here
- Aug 20 webinar here
- AgWG drafting recommendation language
- WTWG approval TODAY
- WQGIT considers report 9/14/15 with recommendations from WGs