

Title 15
DEPARTMENT OF AGRICULTURE

Subtitle 20 SOIL AND WATER CONSERVATION

15.20.04 Nutrient Management Certification and Licensing

Subtitle 20 SOIL AND WATER CONSERVATION

15.20.07 Agricultural Operation Nutrient Management Plan Requirements

Subtitle 20 SOIL AND WATER CONSERVATION

15.20.08 Content and Criteria for a Nutrient Management Plan Developed for an Agricultural Operation

Authority: Agriculture Article, §§8-801—8-806, Annotated Code of Maryland

Notice of Proposed Action

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The Secretary of Agriculture proposes to (1) Amend Regulation .11 under COMAR 15.20.04 Nutrient Management Certification and Licensing;

(2) Amend Regulation .02 under COMAR 15.20.07 Agricultural Operation Nutrient Management Plan Requirements; and

(3) Amend Regulations .01, .03, .05, re-codify existing .06 and .07 to be .12 and .13, and add new Regulations .06—.11 under COMAR 15.20.08 Content and Criteria for a Nutrient Management Plan Developed for an Agricultural Operation.

Statement of Purpose

The purpose of this action is to establish a multi-year process for transitioning from the Phosphorus Site Index to the Phosphorus Management Tool as a means to identify potential risk of phosphorus loss from farms. It requires the use of the Phosphorus Management Tool to determine phosphorus applications at the conclusion of this transition period. It includes certain reporting requirements for evaluating the implementation of the Phosphorus Management Tool. It establishes the Phosphorous Management Tool Transition Advisory Committee and describes the analysis that the Maryland Department of Agriculture shall undertake in consultation with this committee. It adds Supplement No. 8 (February, 2015) to the Maryland Nutrient Management Manual, which is incorporated by reference under COMAR 15.20.07.02. Supplement No. 8, which describes the Phosphorus Management Tool, modifies the method for determining nutrient recommendations in a nutrient management plan and, more specifically, the method for the determination of phosphorus as the limiting nutrient. By this action, the Department withdraws its proposed amendments as published in 41:24 Md. R. 1432-1439 (December 1, 2014) to Regulation .11 under COMAR 15.20.04 Nutrient Management

Certification and Licensing; Regulation .02 under COMAR 15.20.07 Agricultural Operation Nutrient Management Plan Requirements; and Regulation .05 under COMAR 15.20.08 Content and Criteria for a Nutrient Management Plan Developed for an Agricultural Operation.

Comparison to Federal Standards

There is no corresponding federal standard to this proposed action.

Estimate of Economic Impact

I. Summary of Economic Impact.

The proposed action will affect certain farms with high phosphorus levels in the soil. Additional management will be required on these farms based on the risk of phosphorus loss from the field. Generally, these farmers will be required to reduce or eliminate the application of additional phosphorus to their fields. In cases where organic sources of nutrients, such as animal manures containing both phosphorus and nitrogen, have been applied, these farmers will be required to purchase inorganic commercial fertilizer to provide the nitrogen previously provided by manure. These newly restricted animal manures will need to be transported to other farms having land that can appropriately utilize the manure in accordance with new requirements.

II. Types of Economic Impact.	Revenue (R+/R-) Expenditure (E+/E-)	Magnitude
A. On issuing agency:	NONE	
B. On other State agencies:	NONE	
C. On local governments:	NONE	
	Benefit (+) Cost (-)	Magnitude
D. On regulated industries or trade groups:	(-)	\$22.5 million
E. On other industries or trade groups:	(+)	\$10.1 million
F. Direct and indirect effects on public:	(+)	\$100 million

III. Assumptions. (Identified by Impact Letter and Number from Section II.)

D. The proposed action will affect certain farms with high phosphorus levels in the soil. The proposal amends an existing risk assessment tool, known as the Phosphorus Site Index (“PSI”), used to determine the potential for phosphorus loss from the field. The new Phosphorus Management Tool (“PMT”), developed by scientists at the University of Maryland, is suggested to have the greatest potential impact on soils with high soil phosphorus in areas where ground water is closest to the surface and in fields closest to surface water.

Additional management will be required on these farms based on the risk of phosphorus loss from the field. Generally, these farmers will be required to reduce or eliminate the application of

additional phosphorus to their fields. In cases where organic sources of nutrients, such as animal manures containing both phosphorus and nitrogen, have been applied, these farmers will be required to purchase inorganic commercial fertilizer to provide the nitrogen previously provided by manure. These newly restricted animal manures will need to be transported to other farms having land that can appropriately utilize the manure in accordance with new requirements.

The Department commissioned a report by the Business Economic and Community Network (“BEACON”) at Salisbury University to analyze the costs and benefits associated with the implementation of the PMT. Under the direction of Dr. Memo Diriker, a stakeholder advisory group provided extensive detail on agricultural management and operational cost information. A range of macro-level cost variables were considered for factors affected by the PMT, including agriculture, land values, recreation, water-based activities, crop fertilizer, manure transportation and handling, infrastructure, community costs, and others.

The BEACON study considered three implementation scenarios, including the six-year phase-in approach similar to the multi-year approach under the proposed action. The six-year scenario assumed incentives and program support of \$79 million to offset farm-related costs and support the deployment of alternative technologies related to manure utilization. Current state and federal funding provide \$58 million of support and \$21 million is assumed to be new funding, with \$15.5 million of the new funding provided from state sources.

Cost variables were considered over a range of costs, given certain unknown factors, producing a range of net aggregate costs. The net aggregate cost for the six-year scenario at the 50th percentile is \$22.5 million. According to the report, this number represents macro level PMT implementation costs minus subsidies.

While the BEACON study considered both macro and micro (farm-scale) impacts, Dr. Diriker explains that specific farm-scale costs cannot be calculated until more specific detail regarding requirements are provided and certain experience is realized to inform further analysis. While certain farms will realize additional operating costs due to manure transportation and handling and replacement commercial fertilizer, other farms will likely realize lower operating costs through the use of relocated manure as a source of crop nutrients. The study developed a farm-scale template that can be activated to more specifically estimate individual farm impacts once additional information is available.

The proposed action includes a provision to collect data from farmers that provide existing soil phosphorus levels on farm fields in Maryland. This data will be instrumental in identifying potential receiving areas geographically in order to redistribute additional animal manures that will be become available. This data will prove valuable in the development of alternative uses and in sustaining the value of animal manures in a market-driven system.

E. Assuming 228,000 of additional poultry litter will require relocation to other farms for land application, an average cost of \$14 per ton for transportation costs, and existing level of Manure Transport Program activity is maintained, total public expenditures for manure transport will exceed \$4.6 million annually. These subsidies translate into additional economic activity for contractors providing these services to farmers. Additionally, infrastructure expansion costs for manure transportation and loading equipment, plus additional spreading equipment for

commercial fertilizer is estimated to generate \$5.5 million in sales for vendors of such new equipment.

F. The public will benefit from the proposal through improved water quality and environmental conditions in local rivers and streams. The quality of life of Marylanders will improve by virtue of healthy local water bodies and additional measures toward a restored Chesapeake Bay.

The BEACON study included consideration of environmental and social benefits that might be derived from implementing the PMT. The final report cites an October 2014 Chesapeake Bay Foundation (CBF) report, *The Economic Benefits of Cleaning Up the Chesapeake Bay*. The CBF report attributes \$4.6 billion of annual economic benefit to Maryland as result of meeting Bay restoration goals. BEACON estimates \$100 million of statewide economic benefits associated with implementing the PMT on the Eastern Shore. However the BEACON report cites: “While significant, this statewide MACRO-Level benefit estimate attributable to the implementation of the PMT on the Eastern Shore cannot be directly compared to the farm-level costs of implementation estimated in the three scenarios. Most of the MACRO-Level benefit estimates involve value enhancements and potential cost savings. They are not financial resources that can be used to defray the farmers’ PMT implementation costs.”

A copy of *A Scenario Analysis of the Potential Costs of Implementing the Phosphorus Management Tool on the Eastern Shore of Maryland*, BEACON at Salisbury University, November 2014, is available on the Department’s website at <http://mda.maryland.gov/Documents/pmt-analysis.pdf>.

Economic Impact on Small Businesses

The proposed action has a meaningful economic impact on small business. An analysis of this economic impact follows.

The proposed action will affect certain farms with high phosphorus levels in the soil. The proposal amends an existing risk assessment tool, known as the Phosphorus Site Index (PSI), used to determine the potential for phosphorus loss from the field. The new Phosphorus Management Tool (PMT), developed by scientists at the University of Maryland, is suggested to have the greatest potential impact on soils with high soil phosphorus in areas where ground water is closest to the surface.

Additional management will be required on farms based on the risk of phosphorus loss from the field. Generally, these farmers will be required to reduce or eliminate the application of additional phosphorus to their fields. In cases where organic sources of nutrients, such as animal manures containing both phosphorus and nitrogen, have been applied, these farmers will be required to purchase inorganic commercial fertilizer to provide the nitrogen previously provided by manure. These newly restricted animal manures will need to be transported to other farms having land that can appropriately utilize the manure in accordance with new requirements.

Businesses engaged in the loading and hauling of animal waste will realize increased business activity in geographic areas of the state where animal production is concentrated. As certain farms are restricted from using animal manure as a crop fertilizer, this manure will need to be

hauled to receiving areas better able to use the manure within the provisions of the regulation.

Businesses engaged in the sale and land application of commercial fertilizers in the areas where the regulation limits the application of animal manures will realize expanded business activity. These fertilizer companies will be providing commercial inorganic nitrogen to replace nitrogen previously included in applied manures. Conversely, these same type businesses located in receiving areas, may realized reduced sale and application of commercial fertilizers.

New business opportunities for the land application will develop in areas receiving animal manures. To the extent, farmers in these areas have not been using animal manures as a source of crop nutrients, there will be increased demand for services for hauling and land application.

Impact on Individuals with Disabilities

The proposed action has no impact on individuals with disabilities.

Opportunity for Public Comment

Comments may be sent to Joseph Bartenfelder, Secretary, Maryland Department of Agriculture, 50 Harry Truman Parkway, Annapolis, Maryland 21401, or call 410-841-5880, or email to pmtinfo.mda@maryland.gov, or fax to 410-841-5914. Comments will be accepted through May 4, 2015. A public hearing has not been scheduled.

Economic Impact Statement Part C

A. Fiscal Year in which regulations will become effective: FY 2015

B. Does the budget for the fiscal year in which regulations become effective contain funds to implement the regulations?

No

C. If 'yes', state whether general, special (exact name), or federal funds will be used:

D. If 'no', identify the source(s) of funds necessary for implementation of these regulations:

N/A

E. If these regulations have no economic impact under Part A, indicate reason briefly:

F. If these regulations have minimal or no economic impact on small businesses under Part B, indicate the reason and attach small business worksheet.

G. Small Business Worksheet:

Subtitle 20 SOIL AND WATER CONSERVATION

Chapter 04 Nutrient Management Certification and Licensing

Authority: Agriculture Article, §§8-801—8-806, Annotated Code of Maryland

.11 Record-Keeping and Reporting Requirements.

A. (text unchanged)

B. *Information Concerning the Phosphorus Management Tool.*

(1) *As provided in §B(2) and (3) of this regulation, a license holder or a certified consultant who is not operating under a license shall file a report with the Department that includes information relating to nutrient management plans developed for operations which have soils with a phosphorus fertility index value of 150 or above.*

(2) *The report shall include information that the Department determines necessary to evaluate the implementation of the Phosphorus Management Tool, as provided in the Maryland Nutrient Management Manual, Section II-C2.*

(3) *The report shall be filed annually on a form developed by the Department not later than September 30th .*

(4) *The Department shall maintain the information provided in the report in a manner that protects the identity of the person for whom the plan was prepared and that person's personal information.*

C. *Information related to soil test phosphorus*

(1) *As provided in §C(2)—(4) of this regulation, a license holder or a certified consultant who is not operating under a license shall file a report with the Department that includes field or management-unit information relating to phosphorus levels in the soil determined by a soil analysis conducted in accordance with COMAR 15.20.08.05D related to nutrient management plans developed in accordance with COMAR 15.20.07 and 15.20.08.*

(2) *The report shall include:*

(a) *Soil test phosphorus levels for each field or management unit in the nutrient management plan and expressed in terms of the Fertility Index Value;*

(b) *Acreage associated with a specific soil analysis and field or management unit;*

(c) *The county in which the field or management unit is located; and*

(d) *Other information that the Department considers necessary to evaluate soil phosphorus data.*

(3) *The report shall be filed on a form developed by the Department not later than September 30, 2015 and every sixth year thereafter.*

(4) *The report may not include any information identifying the person or specific operation about whom the report is prepared.*

D. *List of Reported Operations*

Concurrent with the report required under §C of this regulation, a license holder or a certified consultant who is not operating under a license shall file a separate report with the Department that includes the names of the persons, farm names, as applicable, and addresses of those operations for which soil phosphorus data has been provided to the Department.

[B.] E. (text unchanged)

15.20.07 Agricultural Operation Nutrient Management Plan Requirements

Authority: Agriculture Article, §§8-801—8-806, Annotated Code of Maryland

.02 Incorporation by Reference.

The performance and technical standards provided in this subtitle are found in the Department of Agriculture's Maryland Nutrient Management Manual (November 1999), Supplement No. 1 (September 2000), Supplement No. 2 (November 2001), Supplement No. 3 (September 2004), Supplement No. 4 (November 2005), [and] Supplement No. 5 (November 2006), Supplement No. 6 (May 2009), [and] Supplement No. 7 (May 2012), and Supplement No. 8 (February 2015), which are incorporated by reference.

15.20.08 Content and Criteria for a Nutrient Management Plan Developed for an Agricultural Operation

Authority: Agriculture Article, §§8-801—8-806, Annotated Code of Maryland

.01 Scope.

A.—C. (text unchanged)

D. *This chapter also describes the transition from the Phosphorus Site Index to the Phosphorus Management Tool as a means to identify potential risk of phosphorus loss from farms. Like the Phosphorus Site Index, the Phosphorus Management Tool will be employed when a soil sample analysis shows a phosphorus fertility index value ("P FIV") of 150 or greater. Unless the transition schedule is adjusted as provided in this chapter, the Phosphorus Management Tool will be phased-in over a 7-year period as shown in the chart found in Regulation .10 of this chapter. Farms that have excess soil phosphorus will be placed in one of three tiers, as determined by the particular operation's average phosphorus fertility index value. Farms with an average*

P FIV of 450 and greater will be the first operations required to begin implementing the Phosphorus Management Tool, but will be given a longer time-frame to fully implement it. Farms with an average P FIV of (1) 150 and greater, but less than 300, and (2) 300 and greater, but less than 450, will be required to begin implementing the Phosphorus Management Tool later but will be given less time to complete this transition.

.03 Definitions.

A. (text unchanged)

B. Terms Defined.

(1)—(3) (text unchanged)

(4) *“Average Soil Phosphorus Fertility Index Value” or “Average Soil P FIV” means a value:*

(a) *Determined for an agricultural operation by averaging the P FIV of all fields or management units within the operation that have a P FIV greater than 150 (calculated by adding together the P FIV of each field or management unit within the operation that has a P FIV greater than 150 and dividing this sum by number of any such fields or management units); and*

(b) *Established not later than June 30, 2016, using soil tests not more than 3 years old.*

[(4)] (5)—[(29)] (30) (text unchanged)

(31) *“Phosphorus Management Tool” means the new procedure developed by the University of Maryland, approved by the Department, and described in the Maryland Nutrient Management Manual, Section II-C, that:*

(a) *Uses characteristics of soils, landforms, and management practices to identify potential risk of phosphorus losses from soils to waters; and*

(b) *Shall be phased-in between 2016 and not later than 2024, ultimately replacing the Phosphorus Site Index.*

[(30)] (32) *“Phosphorus [site index] Site Index” means the original procedure developed by the University of Maryland, approved by the Department, and described in the Maryland Nutrient Management Manual, Section II-C, that:*

(a)—(b) (text unchanged)

(33) *“Phosphorus Transition Management Phase I” means the first of two management phases that farms with a soil P FIV of 150 or greater shall employ when transitioning from use of the Phosphorus Site Index to the Phosphorus Management Tool as a means to determine the application of additional phosphorus that:*

(a) *Consists of three risk categories determined by a calculation of the Phosphorus Management Tool; and*

(b) *Includes a schedule for implementation based on the average soil P FIV for the operation.*

(34) *“Phosphorus Transition Management Phase II” means the second of two management phases that farms with a soil P FIV of 150 or greater shall employ when transitioning from the use of the Phosphorus Site Index to the Phosphorus Management Tool as a means to determine the application of additional phosphorus that:*

(a) *Consists of three risk categories determined by a calculation of the Phosphorus Management Tool; and*

(b) *Includes a schedule for implementation based on the average soil P FIV for the operation.*

[(31)] (35)—[(36)] (40) (text unchanged)

(41) *“Tier A operations” means those farms that have an average soil P FIV of 150 or greater but less than 300.*

(42) *“Tier B operations” means those farms that have an average soil P FIV of 300 or greater but less than 450.*

(43) *“Tier C operations” means those farms that have an average soil P FIV of 450 or greater.*

[(37)] (44)—[(39)] (46) (text unchanged)

.05 Nutrient Management—Required Plan Recommendations.

A.—D. (text unchanged)

E. Determination of Limiting Nutrient.

(1)—(2) (text unchanged)

(3) *If the soil sample analysis results show a phosphorus fertility index value (FIV) of less than 150, nutrient recommendations may [use] be based on nitrogen plant needs as the limiting factor in accordance with the recommendations described in the Maryland Nutrient Management Manual, Section I-B.*

(4) **Phosphorus Criteria for Tier A Operations.**

(a) *If the soil sample analysis results show a phosphorus fertility index value (FIV) of 150 or greater, a phosphorus site index or other phosphorus risk assessment method acceptable to the Department, as provided in the Maryland Nutrient Management Manual, Section II-B, shall be used to determine the potential risk of phosphorus loss due to site characteristics.*

(b) *If the risk for potential movement of phosphorus from the site is low according to the phosphorus site index, nutrient recommendations by the consultant or certified farm operator may use nitrogen plant needs as the limiting factor.*

(c) *If the risk for potential movement of phosphorus from the site is medium according to the phosphorus site index:*

(i) *Nutrient rates shall be based on nitrogen plant needs as the limiting factor no more than 1 out of every 3 years. Phosphorus rates the other 2 years shall be limited to the expected amount removed from the field by the crop or plant harvest, or the amount indicated by soil testing in accordance with the recommendations described in the Maryland Nutrient Management Manual, Section I-B, whichever is greater; or*

(ii) *Nutrient recommendations may use nitrogen plant needs as the limiting factor if BMPs are implemented by the operator and address site or management characteristics to reduce the risk of phosphorus loss to low.*

(d) *If the risk for potential movement of phosphorus from the site is high according to the phosphorus site index:*

(i) *Phosphorus rates shall be limited to the expected amount removed from the field by the crop or plant harvest, or the amount indicated by soil testing, in accordance with the recommendations described in the Maryland Nutrient Management Manual, Section I-B; or*

(ii) If BMPs are implemented by the operator, and address site or management characteristics to reduce the risk of phosphorus loss to medium, nutrient rates may be based on nitrogen plant needs as the limiting factor not more than 1 out of every 3 years. Phosphorus rates the other 2 years shall be limited to the expected amount removed from the field by the crop or plant harvest, or the amount indicated by soil testing or in accordance with recommendations described in the Maryland Nutrient Management Manual, Section I-B, whichever is greater.

(e) If the risk for potential movement of phosphorus from the site is very high according to the phosphorus site index:

(i) No additional phosphorus may be applied; or

(ii) If BMPs are implemented by the operator, and address site or management characteristics to reduce the risk of phosphorus loss to high, recommended rates of application of phosphorus shall be limited to the expected amount removed from the field by the crop or plant harvest, or the amount indicated by soil testing in accordance with recommendations described in the Maryland Nutrient Management Manual, Section I-B.

(5) Before the deadlines set forth in COMAR 15.20.07.03 for the development of a phosphorus-based plan, a certified nutrient management consultant or certified farm operator may use:

(a) The requirements of §E(1)—(3) of this regulation as a planning tool to determine if future management changes are indicated by the P index, and if development of a phased-in approach to a phosphorus-based plan should be recommended; or

(b) §E(1)—(3) of this regulation as a guide to determine nutrient management recommendations.]

(a) *Except for nutrient management plans developed in accordance with §E(4)(e) of this regulation, the certified consultant shall:*

(i) *Provide the operator information outlining the changes in the management of the operation that will be required when the Phosphorus Management Tool becomes effective;*

(ii) *Calculate the Average Soil Phosphorus Fertility Index Value for the operation; and*

(iii) *Report the Average Soil Phosphorus Fertility Index Value for the operation to the Department on a form provided by the Department no later than September 1, 2016.*

(b) *Nutrient management plans implemented before July 1, 2019 shall:*

(i) *Be developed using both the Phosphorus Site Index and the Phosphorus Management Tool, as provided in the Maryland Nutrient Management Manual, Section II-C; and*

(ii) *Use the Phosphorus Site Index set forth in Regulation .06 of this chapter to determine phosphorus applications.*

(c) *Nutrient management plans implemented between July 1, 2019 and June 30, 2020 shall use the Phosphorus Transition Management Phase I set forth in Regulation .07 of this chapter to determine phosphorus applications.*

(d) *Unless the transition schedule is adjusted as provided under this paragraph, nutrient management plans implemented between July 1, 2020 and June 30, 2021 shall use the Phosphorus Transition Management Phase II set forth in Regulation .08 of this chapter to determine phosphorus applications. Before January 1, 2020, the Department, in consultation with the Phosphorus Management Tool Transition Advisory Committee, shall conduct an evaluation of the existing markets for animal manures, participation in and additional capacity of the Manure Transport Program, the capacity of existing infrastructure for manure transportation, handling and land application, the availability of public and private sector resources, and the status and capacity of alternative uses to utilize animal manures. The evaluation shall be comprehensive in scope, considering all available, relevant information to address current major animal agriculture sectors in the State with the objective of advancing implementation of the next level of management to the maximum extent practicable. If the results of this evaluation indicate insufficient capacity to support the additional volume of animal manure expected to be created when operations are required to determine phosphorus applications under Transition Management Phase II:*

(i) *Transition Management Phase I shall continue to be used to determine phosphorus applications for one additional year, through June 30, 2021;*

(ii) *The transition to Transition Management Phase II, as provided in this section, shall be implemented one year later, beginning July 1, 2021; and*

(iii) *The subsequent schedule to transition to the Phosphorus Management Tool, as provided in §E(4)(e) of this regulation, likewise shall be implemented one year later, beginning July 1, 2022.*

(e) *Unless the transition schedule is adjusted as provided under either §E(4)(d) of this regulation or this paragraph, nutrient management plans implemented after July 1, 2021 shall use the Phosphorus Management Tool set forth in Regulation .09 of this chapter to determine phosphorus applications. Before January 1, 2021 or, alternatively, January 1, 2022, if the transition schedule has been adjusted under §E(4)(d) of this regulation, the Department, in consultation with the Phosphorus Management Tool Transition Advisory Committee, shall conduct an evaluation of the existing markets for animal manures, participation in and additional capacity of the Manure Transport Program, the capacity of existing infrastructure for manure transportation, handling and land application, the availability of public and private sector resources, and the status and capacity of alternative uses to utilize animal manures. The evaluation shall be comprehensive in scope, considering all available, relevant information to address current major animal agriculture sectors in the State with the objective of advancing implementation of the next level of management to the maximum extent practicable. If the results of this evaluation indicate insufficient capacity to support the additional volume of animal manure expected to be created when operations are required to determine phosphorus applications under the Phosphorus Management Tool:*

(i) *Transition Management Phase II shall continue to be used to determine phosphorus applications for one additional year, through June 30, 2022 or, alternatively, June 30, 2023, if the schedule has also been adjusted under §E(4)(d) of this regulation;*

(ii) *The Phosphorus Management Tool shall be used to determine phosphorus applications after June 30, 2022 or, alternatively, after June 30, 2023, if the schedule has also been adjusted under §E(4)(d) of this regulation.*

(5) Phosphorus Criteria for Tier B Operations.

(a) Except for nutrient management plans developed in accordance with §E(5)(e) of this regulation, the certified consultant shall:

(i) Provide the operator information outlining the changes in the management of the operation that shall be required when the Phosphorus Management Tool becomes effective;

(ii) Calculate the Average Soil Phosphorus Fertility Index Value for the operation; and

(iii) Report the Average Soil Phosphorus Fertility Index Value for the operation to the Department on a form provided by the Department not later than September 1, 2016.

(b) Nutrient management plans developed for implementation before July 1, 2018 shall:

(i) Be developed using both the Phosphorus Site Index and the Phosphorus Management Tool, as provided in the Maryland Nutrient Management Manual, Section II-C; and

(ii) Use the Phosphorus Site Index set forth in Regulation .06 of this chapter to determine phosphorus applications.

(c) Nutrient management plans implemented between July 1, 2018 and June 30, 2019 shall use the Phosphorus Transition Management Phase I set forth in Regulation .07 of this chapter to determine phosphorus applications.

(d) Unless the schedule is adjusted as provided under this paragraph, nutrient management plans implemented between July 1, 2019 and June 30, 2021 shall use the Phosphorus Transition Management Phase II set forth in Regulation .08 of this chapter to determine phosphorus applications. Before January 1, 2019, the Department, in consultation with the Phosphorus Management Tool Transition Advisory Committee, shall conduct an evaluation of the existing markets for animal manures, participation in and additional capacity of the Manure Transport Program, the capacity of existing infrastructure for manure transportation, handling and land application, the availability of public and private sector resources, and the status and capacity of alternative uses to utilize animal manures. The evaluation shall be comprehensive in scope, considering all available, relevant information to address current major animal agriculture sectors in the State with the objective of advancing implementation of the next level of management to the maximum extent practicable. If the results of this evaluation indicate insufficient capacity to support the additional volume of animal manure expected to be created when operations are required to determine phosphorus applications under Transition Management Phase II:

(i) Transition Management Phase I shall continue to be used to determine phosphorus applications for one additional year, through June 30, 2020;

(ii) The transition to Transition Management Phase II, as provided in this section, shall be implemented one year later, beginning July 1, 2020; and

(iii) The subsequent schedule to transition to the Phosphorus Management Tool, as provided in §E(5)(d) of this regulation, shall be implemented two years later, beginning July 1, 2022.

(e) Unless the transition schedule is adjusted as provided under either §E(5)(d) of this regulation or this paragraph, nutrient management plans implemented after July 1, 2021 shall use the Phosphorus Management Tool set forth in Regulation .09 of this chapter to determine phosphorus applications. Before January 1, 2021 or, alternatively, January 1, 2022, if the transition schedule has been adjusted under §E(5)(d) of this regulation, the Department, in consultation with the Phosphorus Management Tool Transition Advisory Committee, shall conduct an evaluation of the existing markets for animal manures, participation in and additional capacity of the Manure Transport Program, the capacity of existing infrastructure for manure transportation, handling and land application, the availability of public and private sector resources, and the status and capacity of alternative uses to utilize animal manures. The evaluation shall be comprehensive in scope, considering all available, relevant information to address current major animal agriculture sectors in the State with the objective of advancing implementation of the next level of management to the maximum extent practicable. If the results of this evaluation indicate insufficient capacity to support the additional volume of animal manure expected to be created when operations are required to determine phosphorus applications under the Phosphorus Management Tool:

(i) Transition Management Phase II shall continue to be used to determine phosphorus applications for one additional year, through June 30, 2022 or, alternatively, June 30, 2023, if the schedule has also been adjusted under §E(5)(d) of this regulation; and

(ii) The Phosphorus Management Tool shall be used to determine phosphorus applications after June 30, 2022 or, alternatively, after June 30, 2023, if the schedule has also been adjusted under §E(5)(d) of this regulation.

(6) Phosphorus Criteria for Tier C Operations.

(a) Except for nutrient management plans developed in accordance with §E(6)(e) of this regulation, the certified consultant shall:

(i) Provide the operator information outlining the changes in the management of the operation that will be required when the Phosphorus Management Tool becomes effective;

(ii) Calculate the Average Soil Phosphorus Fertility Index Value for the operation; and

(iii) Report the Average Soil Phosphorus Fertility Index Value for the operation to the Department on a form provided by the Department not later than September 1, 2016.

(b) Nutrient management plans implemented prior to July 1, 2017 shall:

(i) Be developed using both the Phosphorus Site Index and the Phosphorus Management Tool, as provided in the Maryland Nutrient Management Manual, Section II-C; and

(ii) Use the Phosphorus Site Index set forth in Regulation .06 of this chapter to determine phosphorus applications.

(c) Nutrient management plans implemented between July 1, 2017 and June 30, 2019 shall use the Phosphorus Transition Management Phase I set forth in Regulation .07 of this chapter to determine phosphorus applications.

(d) Unless the schedule is adjusted as provided under this paragraph, nutrient management plans implemented between July 1, 2019 and June 30, 2021 shall use the Phosphorus Transition Management Phase II set forth in Regulation .08 of this chapter to determine phosphorus applications. Before January 1, 2019, the Department, in consultation with the Phosphorus Management Tool Transition Advisory Committee, shall conduct an evaluation of the existing markets for animal manures, participation in and additional capacity of the Manure Transport Program, the capacity of existing infrastructure for manure transportation, handling and land application, the availability of public and private sector resources, and the status and capacity of alternative uses to utilize animal manures. The evaluation shall be comprehensive in scope, considering all available, relevant information to address current major animal agriculture sectors in the State with the objective of advancing implementation of the next level of management to the maximum extent practicable. If the results of this evaluation indicate insufficient capacity to support the additional volume of animal manure expected to be created when operations are required to determine phosphorus applications under Transition Management Phase II:

(i) Transition Management Phase I shall continue to be used to determine phosphorus applications for one additional year, through June 30, 2020;

(ii) The transition to Transition Management Phase II, as provided in this section, shall be implemented one year later, beginning July 1, 2020; and

(iii) The subsequent schedule to transition to the Phosphorus Management Tool, as provided in §E(6)(e) of this regulation, shall be implemented two years later, beginning July 1, 2022.

(e) Unless the transition schedule is adjusted, as provided under either §E(6)(d) of this regulation or this paragraph, nutrient management plans implemented after July 1, 2021 shall use the Phosphorus Management Tool set forth in Regulation .09 of this chapter to determine phosphorus applications. Before January 1, 2021 or, alternatively, January 1, 2022, if the transition schedule has been adjusted under §E(6)(d) of this regulation, the Department, in consultation with the Phosphorus Management Tool Transition Advisory Committee, shall conduct an evaluation of the existing markets for animal manures, participation in and additional capacity of the Manure Transport Program, the capacity of existing infrastructure for manure transportation, handling and land application, the availability of public and private sector resources, and the status and capacity of alternative uses to utilize animal manures. The evaluation shall be comprehensive in scope, considering all available, relevant information to address current major animal agriculture sectors in the State with the objective of advancing implementation of the next level of management to the maximum extent practicable. If the results of this evaluation indicate insufficient capacity to support the additional volume of animal manure expected to be created when operations are required to determine phosphorus applications under the Phosphorus Management Tool:

(i) Transition Management Phase II shall continue to be used to determine phosphorus applications for one additional year, through June 30, 2022 or, alternatively, June 30, 2023, if the schedule has also been adjusted under §E(6)(d), of this regulation;

(ii) The Phosphorus Management Tool shall be used to determine phosphorus applications after June 30, 2022 or, alternatively, after June 30, 2023, if the schedule has also been adjusted under §E(6)(d) of this regulation.

F.—I. (text unchanged)

.06 Nutrient Management—Phosphorus Site Index.

A. Except as provided in §F of this regulation, if the soil sample analysis results show a phosphorus fertility index value of 150 or greater, the Phosphorus Site Index, as provided in the Maryland Nutrient Management Manual, Section II-C1, shall be used to determine the potential risk of phosphorus loss due to site characteristics.

B. Low Risk of Potential Phosphorus Loss. If the risk for potential loss of phosphorus from the site is low according to the Phosphorus Site Index, nutrient recommendations by the consultant or certified farm operator may use nitrogen plant needs as the limiting factor.

C. Medium Risk of Potential Phosphorus Loss.

(1) Except as provided in §C(2) of this regulation, if the risk for potential loss of phosphorus from the site is medium according to the Phosphorus Site Index, nutrient rates shall be based on nitrogen plant needs as the limiting factor not more than one out of every 3 years. Phosphorus rates for the other 2 years shall be limited to the expected amount removed from the field by the planned crop or plant rotation immediately following the phosphorus application, not to exceed two crops, or the amount indicated by soil testing, in accordance with the recommendations described in the Maryland Nutrient Management Manual, Section I-B, whichever is greater.

(2) Nutrient recommendations may use nitrogen plant needs as the limiting factor if BMPs are implemented by the operator before or during the application of additional phosphorus that address site or management characteristics which, according to the outcome of a recalculation using the Phosphorus Site Index, reduce the risk of phosphorus loss to low.

D. High Risk of Potential Phosphorus Loss.

(1) Except as provided in §D(2) of this regulation, if the risk for potential loss of phosphorus from the site is high according to the Phosphorus Site Index, phosphorus rates shall be limited to the expected amount removed from the field by the planned crop or plant rotation immediately following the phosphorus application, not to exceed two crops, or the amount indicated by soil testing, in accordance with the recommendations described in the Maryland Nutrient Management Manual, Section I-B, whichever is greater.

(2) If BMPs are implemented by the operator before or during the application of additional phosphorus that address site or management characteristics which, according to the outcome of a recalculation using the Phosphorus Site Index, reduce the risk of phosphorus loss to medium, nutrient rates may be based on nitrogen plant needs as the limiting factor not more than one out of every 3 years. Phosphorus rates for the other 2 years shall be limited to the expected amount removed from the field by the planned crop or plant rotation immediately following the phosphorus application, not to exceed two crops, or the amount indicated by soil testing, in accordance with recommendations described in the Maryland Nutrient Management Manual, Section I-B, whichever is greater.

E. Very High Risk of Potential Phosphorus Loss.

(1) Except as provided in §E(2) of this regulation, if the risk for potential loss of phosphorus from the site is very high according to the Phosphorus Site Index, no additional phosphorus may be applied.

(2) If BMPs are implemented by the operator before or during the application of additional phosphorus that address site or management characteristics which, according to the outcome of a recalculation using the Phosphorus Site Index, reduce the risk of phosphorus loss to high, recommended rates of application of phosphorus shall be limited to the expected amount removed from the field by the crop or plant harvest, or the amount indicated by soil testing, in accordance with recommendations described in the Maryland Nutrient Management Manual, Section I-B, whichever is greater.

(3) The operator shall consider the implementation of management practices and technologies that are effective in lowering the risk of phosphorus loss, based on research and demonstration of the University of Maryland, or other land grant university, or by the United States Department of Agriculture, Natural Resources Conservation Service, National Planning Procedures Handbook and practice standards adopted for Maryland.

F. If the soil sample analysis results indicate a phosphorus fertility index value of 500 or greater, no phosphorus may be applied.

.07 Nutrient Management—Phosphorus Transition Management Phase I.

A. Except as provided in §E of this regulation, if the soil sample analysis results show a phosphorus fertility index value of 150 or greater, the Phosphorus Management Tool, as provided in the Maryland Nutrient Management Manual, Section II-C2, shall be used to determine the potential risk of phosphorus loss due to site characteristics.

B. Low Risk of Potential Phosphorus Loss.

(1) If the risk for potential loss of phosphorus from the site is low according to the Phosphorus Management Tool, nutrient recommendations by the consultant or certified farm operator may use nitrogen plant needs as the limiting factor.

(2) Nutrient applications shall not exceed the amount of phosphorus removed by the planned crop over a 3-year period.

C. Medium Risk of Potential Phosphorus Loss.

(1) Except as provided in §C(2) of this regulation, if the risk for potential loss of phosphorus from the site is medium according to the Phosphorus Management Tool, total phosphorus applications related to crops anticipated to be planted in a 3-year period shall not exceed the amount of phosphorus removed by the planned crops over the 3-year period, or the amount indicated by soil testing, in accordance with the recommendations described in the Maryland Nutrient Management Manual, Section I-B, whichever is greater.

(2) If BMPs are implemented by the operator before or during the application of additional phosphorus that address site or management characteristics which, according to the outcome of a recalculation using the Phosphorus Management Tool, reduce the risk of phosphorus loss to low, nutrient rates may be established as provided by §B of this regulation.

D. High Risk of Potential Phosphorus Loss.

(1) Except as provided in §D(2) of this regulation, if the risk for potential loss of phosphorus from the site is high according to the Phosphorus Management Tool, phosphorus rates shall be limited to the expected amount removed from the field by the planned crop or plant rotation immediately following the phosphorus application, not to exceed two crops, or the amount indicated by soil testing, in accordance with the recommendations described in the Maryland Nutrient Management Manual, Section I-B, whichever is greater.

(2) If BMPs are implemented by the operator before or during the application of additional phosphorus that address site or management characteristics which, according to the outcome of a recalculation using the Phosphorus Management Tool, reduce the risk of phosphorus loss to medium, nutrient rates may be established as provided by §C of this regulation.

(3) The operator shall consider the implementation of management practices and technologies that are effective in lowering the risk of phosphorus loss based on research and demonstration of the University of Maryland, or other land grant university, or by the United States Department of Agriculture, Natural Resources Conservation Service, National Planning Procedures Handbook and practice standards adopted for Maryland.

E. If the soil sample analysis results indicate a phosphorus fertility index value of 500 or greater, no phosphorus may be applied.

.08 Nutrient Management—Phosphorus Transition Management Phase II.

A. Except as provided in §E of this regulation, if the soil sample analysis results show a phosphorus fertility index value of 150 or greater, the Phosphorus Management Tool, as provided in the Maryland Nutrient Management Manual, Section II-C2, shall be used to determine the potential risk of phosphorus loss due to site characteristics.

B. Low Risk of Potential Phosphorus Loss. If the risk for potential loss of phosphorus from the site is low according to the Phosphorus Management Tool, total phosphorus applications related to crops anticipated to be planted in a 3-year period shall not exceed the amount of phosphorus removed by the planned crops over the 3-year period, or the amount indicated by soil

testing, in accordance with the recommendations described in the Maryland Nutrient Management Manual, Section I-B, whichever is greater.

C. Medium Risk of Potential Phosphorus Loss.

(1) Except as provided in §C(2) of this regulation, if the risk for potential loss of phosphorus from the site is medium according to the Phosphorus Management Tool, total phosphorus applications related to crops anticipated to be planted in a 2-year period shall not exceed the amount of phosphorus removed by the planned crops over the 2-year period, or the amount indicated by soil testing, in accordance with the recommendations described in the Maryland Nutrient Management Manual, Section I-B, whichever is greater.

(2) If BMPs are implemented by the operator before or during the application of additional phosphorus that address site or management characteristics which, according to the outcome of a recalculation using the Phosphorus Management Tool, reduce the risk of phosphorus loss to low, nutrient rates may be established as provided by §B of this regulation.

D. High Risk of Potential Phosphorus Loss.

(1) Except as provided in §D(3) and (4) of this regulation, if the risk for potential loss of phosphorus from the site is high according to the Phosphorus Management Tool, phosphorus rates shall be limited to 50 percent of the expected amount removed from the field by the planned crop or plant rotation immediately following the phosphorus application, not to exceed two crops, or the amount indicated by soil testing, in accordance with the recommendations described in the Maryland Nutrient Management Manual, Section I-B, whichever is greater.

(2) If limits of technology of available application equipment prevent application at 50 percent of the expected amount removed from the field by the crop or plant harvest immediately following the phosphorus application, phosphorus rates shall be limited to the expected amount removed from the field by the crop or plant harvest immediately following the phosphorus application, or the amount indicated by soil testing, in accordance with the recommendations described in the Maryland Nutrient Management Manual, Section I-B, whichever is greater.

(3) If BMPs are implemented by the operator before or during the application of additional phosphorus that address site or management characteristics which, according to the outcome of a recalculation using the Phosphorus Management Tool, reduce the risk of phosphorus loss to medium, nutrient rates may be established as provided by §C of this regulation.

(4) If the crop to be produced is certified as organic pursuant to the requirements of the federal Organic Foods Production Act, 7 U.S.C. §6501 et seq., including implementing federal regulations, as amended, recommended rates of application of phosphorus shall be limited to the expected amount removed from the field by the planned crop or plant rotation immediately following the phosphorus application, or the amount indicated by soil testing in accordance with recommendations described in the Maryland Nutrient Management Manual, Section I-B, whichever is greater.

(5) The operator shall consider the implementation of management practices and technologies that are effective in lowering the risk of phosphorus loss based on research and demonstration of the University of Maryland, or other land grant university, or by the United States Department of Agriculture, Natural Resources Conservation Service, National Planning Procedures Handbook and practice standards adopted for Maryland.

E. If the soil sample analysis results indicate a phosphorus fertility index value of 500 or greater, no phosphorus may be applied.

.09 Nutrient Management—Phosphorus Management Tool.

A. If the soil sample analysis results show a phosphorus fertility index value of 150 or greater, the Phosphorus Management Tool, as provided in the Maryland Nutrient Management Manual, Section II-C2, shall be used to determine the potential risk of phosphorus loss due to site characteristics.

B. Low Risk of Potential Phosphorus Loss. If the risk for potential loss of phosphorus from the site is low according to the Phosphorus Management Tool, total phosphorus applications related to crops anticipated to be planted in a 3-year period shall not exceed the amount of phosphorus removed by the planned crops over the 3-year period.

C. Medium Risk of Potential Phosphorus Loss.

(1) Except as provided in §C(2) of this regulation, if the risk for potential loss of phosphorus from the site is medium according to the Phosphorus Management Tool, phosphorus rates shall be limited to the expected amount removed from the field by the crop or plant rotation immediately following the phosphorus application, not to exceed two crops, or the amount indicated by soil testing, in accordance with the recommendations described in the Maryland Nutrient Management Manual, Section I-B, whichever is greater.

(2) If BMPs are implemented by the operator before or during the application of additional phosphorus that address site or management characteristics which, according to the outcome of a recalculation using the Phosphorus Management Tool, reduce the risk of phosphorus loss to low, nutrient rates may be established as provided by §B of this regulation.

D. High Risk of Potential Phosphorus Loss.

(1) Except as provided in §D(2)—(6) of this regulation, if the risk for potential loss of phosphorus from the site is high according to the Phosphorus Management Tool, no additional phosphorus may be applied.

(2) If BMPs are implemented by the operator before or during the application of additional phosphorus that address site or management characteristics which, according to the outcome of a recalculation using the Phosphorus Management Tool, reduce the risk of phosphorus loss to medium, nutrient rates may be established as provided by §C of this regulation.

(3) If the crop to be produced is certified as organic pursuant to the requirements of the federal Organic Foods Production Act, 7 U.S.C. § 6501 et seq., including implementing federal regulations, as amended, recommended rates of application of phosphorus shall be limited to the expected amount removed from the field by the planned crop or plant rotation immediately

following the phosphorus application, not to exceed two crops, or the amount indicated by soil testing in accordance with recommendations described in the Maryland Nutrient Management Manual, Section I-B, whichever is greater.

(4) Except when subject to cold and wet growing conditions, crops determined to be deficient in phosphorus, as demonstrated by a representative tissue analysis by an accredited laboratory, may receive an application of phosphorus not to exceed 25 percent of the expected amount removed from the field by the crop or plant harvest immediately following the phosphorus application.

(5) Vegetable and tobacco crops with a recommended phosphorus application rate of 40 pounds or more at optimum or excessive fertility levels as provided in the Maryland Nutrient Management Manual, Section I-B, may receive a phosphorus application at planting not to exceed 25 percent of the expected amount removed from the field by the crop or plant harvest immediately following the phosphorus application.

(6) Agricultural operations implementing technologies to reduce the phosphorus content of animal manures by at least 75 percent shall limit phosphorus application rates to 50 percent of the expected amount removed from the field by the planned crop or plant rotation immediately following the phosphorus application, not to exceed two crops.

(7) The operator shall consider the implementation of management practices and technologies that are effective in lowering the risk of phosphorus loss based on research and demonstration of the University of Maryland, or other land grant university, or by the United States Department of Agriculture, Natural Resources Conservation Service, National Planning Procedures Handbook and practice standards adopted for Maryland.

.10 Summary Schedule — Transition from Phosphorus Site Index to Phosphorus Management Tool.

7 YEAR TRANSITION SCHEDULE*

Crop Year (July 1, previous year—June 30)

<i>Crop Year**</i>	2016	2017	2018	2019	2020	2021	2022
<i>Average P FIV >450 (Tier C Operations)</i>	PSI	PSI	TM1	TM1	TM2	TM2	PMT
<i>Average P FIV 300-450 (Tier B Operations)</i>	PSI	PSI	PSI	TM1	TM2	TM2	PMT
<i>Average P FIV 150-299 (Tier A Operations)</i>	PSI	PSI	PSI	PSI	TM1	TM2	PMT
<i>PSI—Phosphorus Site Index</i>							
<i>TM1—Transition Management Phase 1</i>							
<i>TM2—Transition Management Phase 2</i>							
<i>PMT—Phosphorus Management Tool</i>							

*The 7-Year transition period assumes that the Department, in consultation with the Phosphorus Management Tool Transition Advisory Committee does not make any adjustments to the transition schedule as provided for in this chapter.

**The term “crop year” means the one-year period beginning July 1 of the previous year through June 30 of the current year. For example, the 2016 crop year begins on July 1, 2015 and ends on June 30, 2016.

.11 Phosphorus Management Tool Transition Advisory Committee.

A. Beginning in 2015 and continuing until the Phosphorus Management Tool is fully implemented, there shall be established within the Department, the Phosphorus Management Tool Transition Advisory Committee.

B. The Committee shall be chaired by the Secretary. Its membership may include the following persons:

- (1) A member of the Senate, appointed by the President;
- (2) A member of the House of Delegates, appointed by the Speaker;
- (3) The Secretary of the Environment, or his designee;
- (4) The Director of the Maryland Environmental Service, or his designee;
- (5) The Director of the Maryland Energy Administration, or his designee;
- (6) The University of Maryland, College of Agriculture and Natural Resources;
- (7) The Chesapeake Bay Commission;
- (8) Members appointed by the Secretary, including a representative from:
 - (a) The Maryland Farm Bureau;
 - (b) The Maryland Grain Producers Association;
 - (c) The Delmarva Poultry Industry, Inc.;
 - (d) The Maryland Dairy Industry Association;
 - (e) The Chesapeake Bay Foundation;
 - (f) Two non-governmental organizations representing environmental interests;
 - (g) The biosolids industry;
 - (h) The manure hauling industry;
 - (i) The manure application industry; and
 - (j) Two alternative technology vendors or enterprises.

C. The purpose of the committee shall be to:

- (1) Evaluate information relevant to the implementation of the Phosphorus Management Tool including:

- (a) *The quantity and location of excess animal manure within the State;*
 - (b) *The status and activity of manure transportation activities in geographic areas with excess animal manures;*
 - (c) *The viability of markets for animal manures as a crop fertilizer, fuel stock for energy generation and other alternative uses;*
 - (d) *The status and capacity of alternative use technologies using animal manures; and*
 - (e) *Other information the Department and the Advisory Committee deems appropriate.*
 - (2) *Recommend to the Secretary strategies to facilitate the effective implementation of the Phosphorus Management Tool;*
 - (3) *Recommend to the Secretary potential changes to the schedule implementing the Phosphorus Management Tool, as provided for in this chapter; and*
 - (4) *Identify resources necessary for the effective transition to the Phosphorus Management Tool.*
- D. *The Committee shall meet at least annually at a time determined by the Department.*
- E. *Annual Report.*
- (1) *Beginning December 1, 2016 and each year thereafter, until the Phosphorus Management Tool is fully implemented, the Committee shall provide a report to the Governor and the General Assembly.*
 - (2) *The report shall include:*
 - (a) *A summary of the data collected from farms related to the operational changes created by implementing the Phosphorus Management Tool;*
 - (b) *The status of certain programs related to or supporting the transition to the Phosphorus Management Tool;*
 - (c) *Resource needs considered critical for the effective transition to the Phosphorus Management Tool; and*
 - (d) *Policy recommendations to enhance the implementation of the Phosphorus Management Tool.*

[.06].12 Nutrient Management for Container or Out-of-Ground Agricultural Production — Additional Required Plan Content.

A. A certified nutrient management consultant or certified farm operator shall prepare, and an operator of container or out-of-ground agricultural production shall conform to the requirements of §§B—H of this regulation, in addition to applicable requirements described in this chapter, when developing and implementing a nutrient management plan.

B. Plan Elements. A plan shall contain a summary of planned plant production applicable to the site, including:

- (1) (a) Except as provided in paragraph (b) of this subsection, a listing of plants to be grown by name, species, and variety and cultivar or both.
- (b) If more than 20 different kinds of plants are grown, general plant categories may be used, such as herbaceous, deciduous shrub, coniferous evergreen, broadleaf evergreen, or trees;
- (2) The estimated greatest number of plants, units, or containers that will be in production at any one time during a calendar year and the month this will occur;
- (3) The estimated percentages of plants, units, or containers in the following container size categories:
 - (a) Less than 1 gallon (less than 2,492 cubic centimeters container volume),
 - (b) From 1 to 3 gallons (2,492 to 12,164 cubic centimeters),
 - (c) Greater than 3 gallons and less than 15 gallons (more than 12,164, but less than 45,376 cubic centimeters), or
 - (d) 15 gallons or greater (45,376 cubic centimeters or more);
- (4) An inventory, which may include projected changes during the life of the plan, taken by the operator for any purpose within 12 months of completion of the plan, which shall meet the requirements of §B(1), (2), and (3) of this regulation if the inventory is representative of planned production during the period covered by a nutrient management plan;
- (5) Total growing area under the plan, which may include projected changes in growing area planned to take place during the life of the plan.

C. Summary of Nutrient Recommendations. A plan shall contain summary information on the total amount of primary nutrients recommended for each calendar year covered by the plan, including:

- (1) The estimated total amounts of nitrogen, phosphorus, and potash;
- (2) A listing of all sources of nutrients;
- (3) The estimated amounts of each source of nutrients to be applied for each quarter of the year; and
- (4) A listing or description of the application method or methods for each nutrient.

D. Assessment of Environmental Risk. A nutrient management plan shall contain an assessment of the risk of nutrient losses to surface water, using the Environmental Risk Assessment for out-of-ground production provided in the Maryland Nutrient Management Manual, Section II-D.

E. General Management Recommendations. A plan shall contain general recommendations to ensure efficient application of nutrients, including:

- (1) The calibration of equipment;
- (2) The timing and application methods for water and nutrients;
- (3) Management options to maximize the efficient use of water;
- (4) Any operator management options to reduce nutrient losses; and
- (5) Any other best management practices that may be applicable as provided in the Maryland Nutrient Management Manual, Section II-E.

F. Specific Management Recommendations. A consultant or certified farm operator shall recommend growing area or section-specific management techniques to improve water use efficiency and minimize nutrient losses, including the following:

- (1) Grouping plants to improve water and nutrient usage;
- (2) Monitoring water and nutrient needs of plants;
- (3) Increasing the percentage of water and nutrients entering the plant root zone;
- (4) Reducing the amount of leachate or runoff; and
- (5) Reducing or containing the flow of water from growing areas.

G. Program for Monitoring Runoff. A nutrient management plan shall include recommendations to monitor runoff, as required in Regulation .12C of this chapter, including recommendations on methods, frequency, and locations of monitoring.

H. Plan Maintenance. A plan shall contain information to maintain and update the plan. General comments about plan maintenance may be summarized, but shall include:

- (1) The length of time the plan is effective, which may not to exceed 3 years; and
- (2) Identification of changes in the agricultural operation that would require the original plan to be modified or updated, including a:
 - (a) Change in area managed of 20 percent or greater, or 5 acres, whichever is less, or
 - (b) Substantial change in a production plan or method.

[.07].13 Nutrient Management—Required Plan Recommendations for Container or Out-of-Ground Production.

A. Nutrient Recommendations. A certified nutrient management consultant or certified farm operator shall evaluate production cycles and methods and make nutrient recommendations based on at least one of the following:

- (1) The label recommendations on fertilizer products for the plants being grown or similar plants;
- (2) The recommendations of the University of Maryland Cooperative Extension for the specific plants being grown or for similar plants;
- (3) The recommendation from other state universities for the specific plants being grown or for similar plants;
- (4) The data from research done by accredited universities on the specific plants being grown or similar plants;
- (5) The general nutrition guidelines for similar plants; or
- (6) Any generally accepted growing practices for plants under comparable growing conditions.

B. Management Recommendations.

(1) A consultant or certified farm operator shall use the Environmental Risk Assessment for out-of-ground production, as provided in the Maryland Nutrient Management Manual, Section II-D, to identify the potential risk to the environment of nutrient movement from out-of-ground growing areas.

(2) For growing areas where there is zero or low risk of nutrient movement from the site, recommendations shall be made to maintain this zero or low level of risk.

(3) For growing areas where there is medium risk of nutrient movement:

(a) Management recommendations shall be made to minimize the risk of nutrients moving to, or reaching, surface waters; and

(b) The consultant or certified farm operator shall recommend that the operator or other person responsible for irrigation and nutrient management attend Department-approved training on best management practices for out-of-ground production to minimize nutrient losses.

(4) For growing areas where there is high risk of nutrient movement:

(a) Management recommendations shall be made for individual growing areas, as well as for the operation as a whole, to reduce the risk of nutrients moving to, or reaching, surface waters;

(b) The consultant or certified farm operator shall recommend that the operator or other person responsible for irrigation and nutrient management attend Department-approved training on best management practices for out-of-ground production that teaches how to minimize nutrient losses; and

(c) Only controlled release fertilizer shall be recommended for use until management changes reduce the risk of nutrient loss to medium.

(5) In recommending field or management unit practices to reduce or minimize nutrient losses, a consultant or certified farm operator shall consider the following:

(a) The appropriate nutrient application methods;

(b) Nutrient application timing; and

(c) Any plant nutrient needs.

(6) Timing of nutrient application shall be as close to plant nutrient uptake as possible, except in the case of controlled release fertilizer, which may be applied at any time.

C. Recommendations for Monitoring Runoff. Unless an operation is assessed as zero risk for nutrient loss from the site, as provided in the Maryland Nutrient Management Manual, Section II-D, the nutrient management consultant shall recommend a monitoring program, including the following:

(1) The periods for monitoring when plant nutrients can reasonably be expected to be available;

(2) The locations immediately next to growing areas or areas where runoff or overflow from collection basins enters surface water, municipal stormwater, or drainage inlets; and

(3) The frequency of sampling for nutrients:

(a) Where the risk of nutrient movement from any growing area is low, monitoring shall include samples for testing a minimum of two different times during each growing season or cycle from each location; and

(b) Where the risk of impacting surface water is medium or high, monitoring recommendations shall be conducted monthly when nutrients are being applied.

D. Methods of Sampling and Testing. Samples may be analyzed by the operator or consultant on-site using calibrated electrical conductivity or nutrient meters. To evaluate the accuracy of on-site test results, at least two samples per year shall be split, with one part being sent to an independent laboratory for analysis.

JOSEPH BARTENFELDER
Secretary of Agriculture