

## APPENDIX A

### Nutrient Trading Criteria Specific for the Chesapeake Bay Watershed

#### **Purpose:**

The purpose of Appendix A is to provide additional program specific information regarding the use and incorporation of nutrient trading in the Chesapeake Bay Watershed. This Appendix is based on the extensive stakeholder process conducted by the Department throughout 2006.

#### **Background:**

In August, 2005, Maryland enacted new regulations establishing water quality standards for nutrients and sediment. Under federal and state law, Pennsylvania is not permitted to allow NPDES-permitted facilities to contribute to the violation of the surface water quality of downstream states such as Maryland.

These new legal requirements are driven by the Federal Clean Water Act (CWA), which requires the states to protect and maintain the quality of surface waters. The relevant surface waters, under federal law, include the Chesapeake Bay and its tidal tributaries. Pennsylvania and Maryland implement federal CWA requirements through their own state laws and regulations.

This appendix applies the Department's Trading Policy of nutrient and sediment reduction credits that can be used to meet the Maryland surface water quality standards.

#### **Definitions:**

Please see the definitions in the Department's Trading of Nutrient and Sediment Reduction Credits – Policy and Guidelines. Definitions specifically for this Appendix are as follows:

**“Chesapeake Bay Watershed”**- *Those portions of the Susquehanna and Potomac Rivers and their affiliated tributaries within the Commonwealth of Pennsylvania. A small portion of Elk Creek and Northeast Creek in southern Chester County and Gunpowder River in southern York County also provide drainage to the Chesapeake Bay. For this appendix, these three small watersheds are included with the Susquehanna River Basin.*

**“Chesapeake Bay Watershed Model”**- *The Hydrologic Simulation Program in Fortran (HSPF), used to simulate the surface water run off, groundwater flow and the transport of nutrient and sediments to the Chesapeake Bay.*

**“Delegated entity”**- *An entity designated by the Department to carry out specific tasks related to the Nutrient Trading Program.*

**“DMR “** – *The Discharge Monitoring Report that is the EPA uniform national form, including any subsequent additions, revisions, or modifications for the reporting of self-monitoring results by permittees, as modified by the Department.*

**“Edge of Segment (EOS) Load”** – *The amount of land-applied nutrients expected to reach the surface waters at the boundary of a Chesapeake Bay Watershed Model segment through surface runoff and groundwater flows. The EOS load is the value to which BMP model efficiencies to calculate nutrient reductions are applied.*

**“EOS Ratio”** – *A factor that is unique to each watershed model segment that has been determined by the Chesapeake Bay Watershed Model in order to estimate the EOS load for individual non-point sources within a watershed segment.*

**“NRCS”**- *Natural Resources Conservation Service has provided leadership in a partnership effort to help America's private landowners and managers conserve their soil, water, and other natural resources. NRCS employees provide technical assistance based on sound science and suited to a customer's specific needs and provide financial assistance for many conservation activities.*

### **Trading Basics:**

Trading may occur for either nutrient (total phosphorous and total nitrogen) or sediment credits. Credits are the unit of trade and are expressed as mass per unit time (e.g. pounds per year).

Credits generated by trading cannot be used to comply with existing technology-based effluent limits except as expressly authorized by federal regulations.

Credits will have a “shelf-life” of one year. This means that credits need to be measured and accounted for each year. If a BMP has a life span of 10 years, then an entity will have credits for the life of the project but they have to be re-verified and accounted for each year. This can be accomplished through a request to the Department. Additionally, credits cannot be banked for future years. For example, if a BMP generates 10 credits each year and has a life span of five years, 50 credits cannot be applied in the fifth year. Credits must be applied for the year that they are generated.

Trading may occur within the Pennsylvania portion of the Chesapeake Bay Watershed, specifically within the Susquehanna or Potomac watersheds. Trading between a source in the Susquehanna and one located in the Potomac watersheds, however, is not supported.

Trades must be of comparable credits (e.g. nitrogen must be traded for nitrogen) and can occur between:

- Point Sources;
- Nonpoint Sources;
- Third Parties; or
- Any combination of the above.

The Trading Program is not intended to accelerate loss of productive farmland. Therefore, credits will not be generated under this policy from the purchase and idling of whole or substantial portions of farms to provide nutrient credits for use offsite.

Individuals are eligible for nutrient credit generation when converting one land use to another, where the post-construction reduced nutrient loading can be established.

### **Non-Point Source Trading Cap:**

To ensure that the Trading Program is not trading away reductions that are needed to meet the Pennsylvania Tributary Strategy goals, the Department has established maximum tradable loads for each watershed segment. The tradable loads were estimated by comparing a revised Chesapeake Bay Program Tier 4 maximum level of implementation of Best Management Practices (BMPs) to the level of reductions needed to meet Pennsylvania's Tributary Strategy. The tradable loads were estimated as the difference between the level of reductions listed in the Tributary Strategy and an estimate of the maximum reductions that could possibly be achieved using the BMPs listed in the Tributary Strategy and the corresponding BMP efficiencies at the time the Strategy was developed.

### **Baseline and Thresholds of Eligibility for Generating Credits:**

#### Point Sources

For a point source the baseline and threshold for generating nutrient reduction credits is the same. It is the effluent limits expressed in an NPDES permit needed to satisfy the legal requirements related to the Chesapeake Bay and Maryland water quality standards.

#### Agricultural Sources

The baseline and threshold are as follows:

#### **Baseline Requirements**

- Compliance with Chapter 102 Erosion & Sedimentation Regulations, Chapter 91.36 (Agricultural Operations), Act 38 Nutrient Management Regulations, and Chapter 92 (CAFOs) as applicable.
- Compliance can be determined through a site visit or verification of the development and implementation of a Nutrient Management Plan, Erosion and Sedimentation Control Plan or an acceptable Conservation Plan, and a Manure Management Plan, as applicable.
- Compliance must be verified by the Department, Conservation District, or other entity approved by the Department.

#### **Threshold Requirements**

- 100 Foot mechanical setback or equivalent; this is achieved when *ONE* of the following is met:
  - Manure is not mechanically applied within 100 feet of surface water<sup>1</sup>
  - There are no surface waters on or within 100 feet of the farm.
  - Farm uses no manure application and applies commercial fertilizer at or below the Penn State recommended agronomic rates.

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<sup>1</sup> As applicable; for instance, setbacks for CAFOs apply to a broader range of surface waters than non-CAFO operations.

**OR**

- 35 Foot buffer or equivalent; this is achieved when all of the following are met:
  - A minimum of 35 feet of permanent vegetation is established and maintained between the field and surface water.
  - Area can be grazed or cropped under a specific management plan, and permanent vegetation must be maintained at all times. (*Permanent vegetative buffers 50' or greater in width may qualify to generate nutrient reduction credits.*)

**OR**

- 20 % Reduction Option
  - A reduction of 20% in the farm's overall nutrient balance beyond baseline compliance.

For non-agricultural, non-point sources without NPDES requirements, for allocations resulting from a TMDL and for other specified performance requirements, the trading threshold is the level of nutrient and sediment load associated with existing land uses and management practices that comply with applicable state regulations.

**Nutrient Reduction Activities for Credit Generation:**

Credit generation is applicable to activities above and beyond what is required for baseline and threshold.

Point Source

For a point source to generate credits, it must treat at a level that exceeds the requirements stated in the NPDES permit. Credits will be based on the difference in permit limit and treatment level based on DMR information.

Non-point Source

The Department will consider and accept BMPs that are incorporated in the Chesapeake Bay Watershed Model, those identified by NRCS or those that can be measured as generating nutrient reductions such as manure hauling.

BMPs or other potential credit-generating activities occurring after January 1, 2005 may be submitted for review to determine credit eligibility. BMPs or other activities that were completed prior to January 1, 2005 may also be submitted for review and determination of credit eligibility. Non-structural BMPs (e.g., no-till practices, cover crops, advanced nutrient management) that were implemented prior to January 2005 and continue to be utilized and maintained on an annual basis shall be eligible to earn nutrient reduction credits.

**Trading Ratios:**

When calculating credits, trading ratios need to be considered and used as appropriate to help ensure that trading provides the desired level of nutrient reductions or other water quality benefits.

Three types of ratios, delivery, retirement/reserve and edge of segment (EOS), will be applied for trades occurring in the Chesapeake Bay Watershed.

**Delivery Ratio** compensates for a nutrient or sediment's travel in water and will be applied to point and non-point sources. The ratio varies depending on the distance of the source from the mainstem of the Chesapeake Bay. Generally, the greater the distance the pollutant has to travel, the greater the pollutant loss will be. This ratio works to equalize a trade between a source in the headwaters and one near the mainstem. Delivery ratios will be based on information from applicable and accepted data sources, such as the Chesapeake Bay Watershed Model.

**Retirement/Reserve Ratios** are applied to implement policy-driven decisions to require part of the credits generated be reserved to cover for failed BMPs. This ratio adds another layer of security to the credits. The reserve ratio will be ten percent and will apply to all credits. This percentage applied may increase over the life of the trading program.

**EOS Ratio** is a factor that is unique to each watershed model segment that has been determined by the Chesapeake Bay Watershed Model in order to estimate the EOS load for individual non-point sources within a watershed segment. This ratio can also be referred to as "EOS Factor".

### **Quantification and Application of Credits:**

#### Point Source

For a point source to generate credits, it must treat at a level that exceeds the requirements stated in the NPDES permit. Credits would be based on the difference between the permit limit and treatment level reported in the DMR. A point source will also have to apply the appropriate trading ratios such as delivery and retirement/reserve.

#### Non-point Source (Agriculture)

The following methodology will be used for calculation of nutrient reduction credits on agricultural operations.

- 1) Determine if farm is in Baseline Compliance and meets the Threshold for trading
- 2) Determine current rates of nutrient application
- 3) Account for any overall reductions in applications
  - Commercial Fertilizer Applications – Reduction in commercial fertilizer applications below PSU agronomic rate
  - Manure Applications – Reduction in total manure applications below current practices (and below minimal acceptable PSU agronomic rates) through better manure management practices.
  - Combination – Reduction in total nutrient applications (manure and commercial fertilizers) below current practices (and below PSU agronomic rates) through better manure management practices.
- 4) Calculate new nutrient load not going to crop production
- 5) Apply EOS factor to load
- 6) Calculate nutrient reductions from BMP efficiencies. BMP Efficiencies can be calculated from the following methods:

- *Table 1: Nonpoint Source Best Management Practices that have been Peer-Reviewed and CBP-Approved for Phase 5.0 of the Chesapeake Bay Program Watershed Model, Revised 1/12/06*
  - *Table 2: Nonpoint Source Best Management Practices requiring additional Peer-Review for Phase 5.0 of the Chesapeake Bay Program Watershed Model, Revised 1/12/06*
  - Additional methods or Tables that have been approved by the Department
- 7) Total all nutrient reductions in terms of Pounds
  - 8) Apply Delivery Ratio
  - 9) Apply Retirement Ratio
  - 10) Total Credits available

### **Monitoring and Evaluation / Risk Allocation:**

#### Trades involving sources with NPDES permits (point sources)

The Department will enforce permit limits through established Departmental compliance procedures.

The Department will have a program to ensure the effectiveness and validity of the credits used in NPDES permits under this Policy. This program will include use of (1) the credit reserve, (2) verification processes and requirements, and (3) methodologies used to calculate credits before approval. Permittees will have some responsibility to enforce the terms of their credit purchase agreements, except when the activities fail due to uncontrollable or unforeseeable circumstances such as extreme weather conditions. The Department will exercise enforcement discretion with respect to permittees in the year in which credits are determined to be invalid, as long as the permittee replaces the credits for future compliance periods.

#### Trades involving entities without NPDES permits (non-point sources and third parties)

Willful failure by non-point sources or third parties to meet trade contract obligations will result in action by the Department. Other signatories to the contract may also take action.

If the Department determines that BMP failure is due to reasons beyond the control of the credit generator, such as a weather event, the Department will not take action against the credit generator. In applying the retirement/reserve ratio, the Department will be able to cover the failed supplied of credits.

### **Documenting Credits and Trades:**

The Department, using approved methodologies, must approve all credit calculations. Included in the policy is general guidance related to the submission and review of credit generating and trading proposals. This involves the following basic steps:

## 1. Calculation/Generation and Approval of Credits

- a) *Basic calculation.* Nutrient reductions efficiencies developed for and incorporated in the Chesapeake Bay Watershed Model can be used for the calculation. The Department will also consider other scientifically valid calculation approaches, although the review time may take longer.

Groups of credits for discrete nutrient and sediment reduction activities will be assigned a unique identifier by the Department, and will be associated with a certain time period. The time period or “shelf life” for a credit is one year and can be generated for the water year, which is October thru September. Depending on the reduction activities implemented there may be overlap of the year and may generate a “shelf life” greater than a year.

If state or federal funds are used to cost-share nutrient and sediment reduction activities or controls that generate credits, the Department will allow the portion of the credits paid for by state and federal funds to be available for trading, unless restrictions have been placed on the funds by the grantor.

- b) *Ratios.* The calculations of credits must also include the application of the 10% reserve/retirement ratio EOS ratio and the appropriate delivery ratio.
- c) *Approval letter.* When the Department is satisfied that the nutrient and sediment reductions supplied in the proposal meet the requirements described in the policy, it will issue an approval letter, certifying credits potentially generated from the proposal. The letter provides approval of the methodology used to calculate and verify the nutrient reductions from the activities proposed by the submitting entity. It does not guarantee that the credits may be used in a particular trade or permit, unless the letter so states. The letter may include conditions, which must be met before registration of a trade.

## 2. Verification

- a) *General.* A combination of record keeping, monitoring, reporting, inspections, self-certifications and compliance audits will be used to ensure that the credit-generating obligations are being met. The Department may also conduct spot checks of credit generating projects and verification activities to ensure approved practices and activities are being implemented.
- b) *Baseline and threshold verification.* The Department, and approved projects, will have a process for verification that the generator of the credits meets the baseline and threshold requirements of the trading program. This may involve a site visit by Department staff or a Department approved entity, or self-verification by the generator of the credits by means of a process established by the Department. This step may occur at anytime in the process, but will most likely occur before credit approval.

- c) *Nutrient and Sediment Reduction and Operation and Maintenance.* The Department, and approved projects, will also have to verify that the reduction efforts have occurred as planned and are being maintained, such as implementation of farm best management practices or of infrastructure upgrades. This may occur at any time during the life of the credit attributed to a particular activity and may include the submission of verification records.

### 3. Registration and Tracking

- a) *Trade Contracts.* The Department may require a review of trading contracts, between the buyer and seller, before certification of a credit, registration of a trade or use of credits to meet legal requirements. The purpose is to obtain assurance that the credits meet requirements under the Trading Policy, and under applicable regulations.

A model trading contract will be created as a tool to assist in the trading process. This model contract is not required for the Department approval of credits or of trades; other contract terms may be acceptable. The Department will require certain essential elements of a trading contract, unless the circumstances allow otherwise. These will be shown on the Department's Nutrient Trading website.

- b) *Registration.* Trades must be registered before the credits can be used to meet legal requirements. The Department is creating a web-based registration process that will assign unique identifiers to groups of credits. The registration system will be used by Department staff when credits are proposed to be used in a new NPDES permit, and to verify compliance with a NPDES permit during its term.
- c) *Tracking.* The Department will operate a tracking system that identifies all credits approved, trade transactions and use of credits to fulfill legal requirements such as NPDES permits.

### Use of Credits in NPDES Permits

Credits may be used by NPDES permittees to meet effluent limits under specific conditions. Because the credits will be used to meet a permit effluent limit, permittees will only be authorized to use credits through the provisions of their NPDES permit. The permit terms and conditions for trades will require record keeping, monitoring and tracking, which will be documented in the monthly discharge monitoring reports. Other conditions may be set forth in the permit, depending on the circumstances.

The Department will have a program to ensure the effectiveness and validity of the credits used in NPDES permits under this Policy. This program will include use of (1) the credit reserve, (2) verification processes and requirements, and (3) methodologies used to calculate credits before approval. Permittees will have some responsibility to enforce the terms of their credit purchase agreements, except when the activities fail due to

uncontrollable or unforeseeable circumstances such as extreme weather conditions. The Department will exercise enforcement discretion with respect to permittees in the year in which credits are determined to be invalid, as long as the permittee replaces the credits for future compliance periods.

### **Use of Credits in the Sewage Facilities (Act 537) Planning Program**

Under Act 537 and its implementing regulations, all municipalities must develop and implement a sewage facilities plan that addresses present and future sewage disposal needs for the municipality. These plans are modified as new land development projects are proposed or whenever a municipality's sewage disposal needs change. The Department reviews the official plans and any subsequent revisions in accordance with the requirements of 25 PA. Code Chapter 71. This process involves the consideration of the size and timing of a development project, the anticipated nutrient loads, the method of discharge (e.g. on-lot disposal system or through a sewage treatment plant) and the hydraulic and treatment capacity of the receiving sewage treatment plant.

Under these regulations, new land development projects that propose a connection to a treatment facility, or that propose a new treatment facility, must show that the facility will have the ability to meet its effluent limitations. The use of nutrient reduction credits may be included in any Act 537 proposal concerning a new or expanded discharge to address this legal requirement. The Department will expect to see assurances in the proposal that the credits will be available for the life of the treatment facility or, if not, another method to meet the regulations in Chapter 71.

### **Public Participation**

Public notice and comment on the use of trading in permits will be part of the routine procedure followed by the Department with all NPDES permit applications. DEP is required to allow for public participation under the regulations governing NPDES permits. *See* 25 Pa. Code § 92.61. The requirement is to publish notice of completed applications for permits, indicating certain details such as the proposed effluent limitations and a description of how the permittee will be required to meet them.

The Department will describe for the public in this notice any trading provisions in the draft permit. Descriptions of how the trading provisions will meet effluent limits and other regulatory requirements will also be included in the fact sheet as appropriate. These conditions will be subject to the normal public comment period (usually 30 days), which may include a public hearing, along with all of the other conditions in the draft permit. The Department will consider any comments on provisions regarding trading in its finalization of the permit.

The Department will operate a transparent system for review and approval of credits, and registration of trades. Public notice will be made of credit generating proposals, their methods, number of credits to be certified and any trades that occur. Once generators have approved methods of generating credits only the number of credits to be certified for

future submissions and approvals will be public notice. The Department, however, will not subject each credit review or trade registration to public notice and comment.

This approach is endorsed by EPA in its January 13, 2003 Water Quality Trading Policy and is consistent with the federal public participation requirements upon which the Pennsylvania NPDES regulations are based.