

**WV Potomac Nutrient Credit Bank
and Trade Program**

**NRCS Conservation Innovation Grant
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**Biannual Progress Report:
August 2008-February 2009**

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1.0 Executive Summary

Progress this reporting period was slow as we continued to work with the WVDEP, the core team and World Resources Institute (WRI) to finalize both the draft statewide trading guidance, the Potomac basin specific nutrient trading guidance and supporting documentation. The major elements of the guidance that will be discussed with the steering committee at a tentative March meeting include: the appropriate agriculture baseline requirement; details of the credit calculation methodology; establishment of the West Virginia Conservation Agency as the nutrient credit bank; and a proposed infrastructure for the trading program. Policy issues as yet unresolved are inclusion of nutrient limits/allocation for wastewater treatment facilities discharging less than 50,000 gpd; and, determining the appropriate methodology for calculating credits for the urban and mixed open sectors.

Most of the stakeholder efforts during this reporting period included several conference calls with WVDEP, core team and WRI to discuss and refine the draft guidance documents and a webcast with the steering committee to demonstrate NutrientNets calculation methodology, administration, registry and marketplace capabilities.

A one year no cost project extension was requested in January.

We continue to monitor the outcome of the City of Martinsburg's challenge to nutrient allocations imposed by WVDEP and a recent 9th Circuit Court of Appeals decision that prohibits new discharges to impaired waters without an existing compliance schedule (*Friends of Pinto Creek v/s USEPA*). The ultimate outcome of each of these cases could have adverse implications for not only the Potomac trading program but for trading nationwide.

2.0 Activities this reporting period

2.1 Steering committee meetings and Tasks 2 and 3- Target stakeholder group meetings.

Stakeholder engagement continued this period with several phone conferences and a webcast including WVDEP, WRI and the project steering committee. The Core Team has not met this reporting period but has been active in the process of document review and editing on a member by member basis.

2.1.1 WRI NutrientNet demonstration webcast (9/23/08): Thirteen individuals representing The WVDEP, WV Conservation Agency, WV Department of Agriculture, NRCS, EPA, The Conservation Fund and WVU participated. Mindy Selman (WRI) led the group through the various components of NutrientNet (NN) as developed for WV including credit calculation, and the administrative, credit registry and marketplace functions. Several suggestions for improving program NN functionality and transparency were made including:

- The ability to electronically submit the credit calculation and proposal to WVDEP;
- The ability to list point source credit need and potential supply;

- The need to enter various crop rotations (corn, cover crop, etc) to represent variation in soil loss.

2.1.2 Teleconference with WVDEP regarding draft trading guidance (1/15/09): The purpose of the call was to respond to WVDEP questions/comments on the draft trading guidance sent to the agency in September. Meeting notes follow:

This meeting was conducted via conference call due to inclement weather.

Purpose: Finalize the documents outlining the guidelines for WV’s water quality nutrient credit trading program, including the Potomac River trading guidance.

Participants: WVDEP: Randy Sovic, Bill Brannon, Jennifer Pauer, Mike Warwick
WVU: Rick Herd, Tom Brand (and WVCA), Julie Svetlik

Before the guidance documents were discussed, WVDEP mentioned that, in light of the recent bad press related to the Chesapeake Bay restoration, the Ches. Bay Program is planning to impose 2-year milestones for every Bay state. DEP suggests that they will use implementation of the Potomac Nutrient Trading Program as one of the 2-yr milestones in order to meet this requirement.

WV Water Quality Nutrient Trading Program - Guidance Document

ISSUE 1: ARE THIRD PARTIES ALLOWED TO BUY CREDITS? (bottom of pg. 7 under “Eligibility”) There is concern that some entities such as environmental groups will corner the market by buying and holding credits when they become available. After discussion, the group decided that the only “approved third party” that would be allowed to buy/sell credits is the aggregator/broker, and that leaving a vague reference to third parties in the language might cause confusion.

Consensus: leave paragraph as corrected (i.e., with the phrase deleted)

ISSUE 2: SHOULD A BASELINE BE REQUIRED FOR AGRICULTURAL NPS PARTICIPATION? (p. 8(a))

WVU: Farmers are unlikely to participate if they have to expend effort to reduce pollution before they have the opportunity to earn credits. The worst offenders (the very sources we want to manage) have no incentive to change their practices. Other WQT programs (e.g., Great Miami and Ohio) use “existing management practices and land uses” as their baseline for agriculture. If we follow their example, the “bad actors” will be more likely to participate, leading to a program that results in rapid pollutant reductions¹.

DEP: If no baseline is set, then we are essentially rewarding the bad actors for their past non-performance – politically, this idea will not be acceptable. We need to include some mechanism for recognizing those who embraced the nutrient management concept for reasons other than profit.

Suggestions for how to proceed w/o baseline:

- Obtain outside funds to compensate “good actors” for the 50% cost share that they initially expended on their BMPs.

¹ Note from Julie: remember that it is easiest/cheapest to control the first x lbs of pollution; after that, it becomes more difficult & expensive for each additional lb reduced. This implies that the “good actors” will have a harder time generating credits than those participants who are starting from scratch.

- Use the Chesapeake Bay Model (CBM) load reduction numeric nutrient reduction goals for the five specific agricultural land uses in each watershed model segment (current approach).
- Initially require landowners to have a current nutrient management plan in place and use current land use and practices as the baseline until the TMDL is implemented. Upon implementation of the TMDL the specified load reduction requirements become the baseline.

It was agreed that we will use NutrientNet (NN) to run several on-farm scenarios with the current CBM nutrient load reduction goals specific to each land use and watershed segment to determine the costs and social implications of this approach.

Consensus: WVDEP maintains that some sort of baseline must be applied to address the equity issue. The group agrees that a reasonable numeric performance baseline is preferred over a prescriptive practice requirement. Therefore WVU will work with WRI to evaluate various options such as the 2005 and 2007 Chesapeake Bay model runs of existing conditions and practices (v/s the 2010 tributary strategy goals).

ISSUE 3: SHOULD PERMITTEES BE RESPONSIBLE FOR CREDIT COMPLIANCE? (p. 16, 3rd bullet)

WVU: DEP should create a contract/ MOU with WVCA stating that WVCA assumes responsibility for enforcing compliance of NPS, to provide credit buyers with the assurance that they won't be fined for sellers' noncompliance.

DEP: the Clean Water Act places liability for NPDES permit compliance upon the permittee; the DEP only has authority to take action against the permittee, so the compliance responsibility is ultimately falls back on the buyer and/or credit aggregator

Consensus: Un-delete the second sentence (“Where credits have been procured through a Department approved broker/aggregator, it becomes the responsibility of this agent to ensure the credit supplier abides by the purchase agreement.”).

Appendix A – Potomac Guidance Document

ISSUE 1: WHY IS 2005 CHOSEN AS THE YEAR AFTER WHICH BMP STRUCTURES CAN BE BUILT FOR CREDIT GENERATION? (p. 14, last paragraph before “B. Calculation of Delivered Load”) It is assumed that 2005 was chosen as the start date because that was the year that the Tributary Strategy was finalized. However, verifying the installation date is nearly impossible because that information is kept confidential by the NRCS.

Consensus: delete the first sentence of that paragraph.

ISSUE 2: CREDIT CALCULATION VS. GENERATION (p. 15). No description of how credits are calculated is included in this section—it was decided that a description of NutrientNet (and how it calculates credits) should go here. A discussion of NutrientNet's capability of handling PS-PS trades (these transactions can go through DEP, but can also be conducted through NutrientNet) concluded with the decision to include different trading scenarios in the guidance as examples.

Action Items:

- Rick: Clean up language in both documents to reflect discussion.
- Tom: brief WVCA director on this meeting and explore the possibility of approaching the WV legislature for funding to establish and operate the credit bank
- Julie: create strategy for the baseline issue

Next Meeting: follow-up telephone meeting in mid-February

Next Full Committee Meeting: Schedule for an afternoon in mid-March so that the NutrientNet demonstration can be conducted in the morning

2.1.3 Task 1a. Interstate coordination and collaboration on development of WV trading program: The project team has participated in the following activities to ensure that the Potomac trading program design reflects lessons learned from other trading programs and that it does not preclude future interstate trading opportunities.

2.1.4 Interstate Water Quality Trading Conference Calls: Project staff continues to participate in the EPA Interstate Water Quality Trading Conference Call series coordinated with Patricia Gleason from Region 3 EPA. The objective of these calls is to inform Bay state participants of trading program developments in the respective states with the ultimate goal of developing a bay-wide trading program.

2.1.5 Coordination with State Trading Program Personnel: We continue to discuss the basis for various program elements with nutrient trading program representatives from Pennsylvania, Maryland and Ohio and to assess program success. Although there is ample credit supply the PA program is languishing due primarily to uncertainty with long-term availability and price of credits. There is discussion of forming a state run bank to facilitate and underwrite trades in order to reduce risk. Maryland has not yet issued what they refer to as the phase 2 component which includes criteria for point to nonpoint source trades.

3.0 Outputs to date

3.1 Task 3. Nutrient Reductions for Local Benefits: Rocky Marsh watershed project. The National Fisheries and Wildlife Foundation awarded a Targeted Watershed Grant to the Conservation Fund's Freshwater Institute and collaborator West Virginia Water Research Institute in February 2007. The goal of this complementary project is to implement a pilot trading project in Rocky Marsh watershed, Jefferson County, WV that emphasizes local agency/organization/business cooperation in exchange for the explicit generation of ancillary local benefits from nutrient offset projects. The project also emphasizes generation of credits from urban/mixed-open land use areas. This project is critical for this NRCS CIG project as it solidified WVDEP commitment to participate in a water quality trading program and will advance the actualization of CIG grant Task 3, Program Implementation.

The project team has met with the Freshwater Institute team and identified respective tasks to be accomplished to complement the goals and objectives of both projects. Additionally, preliminary meetings have been held with the City of Ranson, WV to identify opportunities for generating urban/mixed open credits associated with low impact development and a newly established city park.

3.2 EPA Targeted Watershed Grant: We were recently awarded a grant from the EPA to conduct a feasibility assessment of the potential for nutrient trading in the Kanawha River basin, WV. The objectives are to evaluate the potential for expanding the nascent Potomac trading

program into the Ohio River drainage of WV and to inform the developing Ohio River basin nutrient trading program with WV specific policy, institutional and technical information and data. The support and involvement of WVDEP in this project indicates the agency's commitment to and recognition of the opportunity to achieve cost effective water quality goals with water quality trading.

3.3 Task 2. Website Development

<http://wvri.nrcce.wvu.edu/programs/pwqb/index.cfm>: The WV Potomac Trading Website is a continually evolving website designed to advance the project goals of transparency, public outreach, and keeping stakeholders as well as our steering committee members informed with the latest reports, organizational links, and materials related to the WV program process. New postings include: The current draft trading guidance documents, and the point source sector briefing presentations.

In addition, in an effort to engage and inform the point source sector of the developing nutrient trading program we prepared an article for publication the the WV public Service Commission's newsletter *Pipeline*. A copy of this article is included as attachment 5.

3.4 Task 1. Draft WV (statewide and Potomac River specific) trading guidance (Attachments 1 and 2):

These documents represent the latest draft trading guidance that are currently being reviewed by WVDEP. We intend to present the final documents to the Steering Committee in March.

3.5 NutrientNet Development Progress Subtasks 1a-1d

Summary

The World Resources Institute continued to be active in the stakeholder process. WRI completed the marketplace and registry portions of NutrientNet and demonstrated these to the workgroup via conference call. WRI has completed the N and P calculations for crop and pasture in addition to finalizing the delivery and edge of stream factors and baseline load amounts from Chesapeake Bay Model data. WRI plans to move forward with incorporating N and P calculations into NutrientNet and demonstrating the application to stakeholders and farmers in the watershed.

3.5.1 Task 1. Develop Accurate Data and Information to Inform Process

Subtask 1a. Utilize and build on existing trading programs (Great Miami, Conestoga, etc.), State trading policies and rules (Pennsylvania, Virginia, Michigan, etc.), and EPA policy and guidance to identify key program elements and "lessons learned" that are transferable to the Potomac Watershed.

Status: Ongoing

Work to date: WRI continued to provide feedback and expertise to the project members via phone calls and meetings.

Planned Work: While the initial research is complete, the program design phase and

stakeholder process will continue to draw upon lessons-learned from existing and emerging programs.

3.5.2 Subtask 1b. Evaluate and compare BMP efficiency rates, runoff coefficients, soil retention factors, equivalence factors, and other inputs and assumptions used by the CBWM with equivalent WV-specific water quality, soil, land use and other pertinent data and information to establish appropriate efficiency rates for practices.

Status: In progress (95% complete)

Work to date: Have gathered appropriate CBWM and agronomic factors from WVU, NRCS, and CBP. This data has been incorporated into spreadsheets.

Planned Work: Continue follow-up work as necessary.

Deliverables:

- CBWM delivery factors and baseline factors table. (final)

3.5.3 Subtask 1c. Based on findings from Subtask 1b, develop WV specific BMP efficiency rates, soil nutrient retention factors, equivalence factors, and runoff coefficients that can be used to tailor NutrientNet.

Status: In progress (80% complete)

Work to date: Created Final spreadsheets for N and P calculations on crop and pasture.

Planned Work: Finalize spreadsheets for animal operations.

Deliverables:

- Draft N spreadsheet for crop/pasture (complete)
- Draft N spreadsheet for animal operations (in progress)
- Draft P spreadsheet for crop/pasture (complete)
- Draft P spreadsheet for animal operations (in progress)
- Final N spreadsheet for crop/pasture (complete)
- Final N spreadsheet for animal operations
- Final P spreadsheet for crop/pasture (complete)
- Final P spreadsheet for animal operations

3.5.4 Subtask 1d. Modify NutrientNet and develop various trading scenarios to estimate potential credit supply and demand, relative incremental credit costs and projected loading reductions.

Status: In progress (50% complete)

Work to Date: Developers have completed marketplace and administrative modules based on PA-NN site design.

Planned Work: Developers will finalize the calculation tools in NutrientNet that incorporate the N and P calculations for crop and pasture.

Deliverables:

- Beta version of NN marketplace and administrative modules (complete)
- Final version of NN marketplace and administrative modules (complete)
- Beta version of NN nonpoint and point source credit calculation tools (in progress)
- Final version of NN nonpoint and point source credit calculation tools

3.6 Task 2. Develop and Implement Stakeholder Process

Status: ongoing

Work to date: WRI attended the following stakeholder meetings:

- o September 23rd (WRI presented the NutrientNet marketplace and registry functions to stakeholders via conference call.)

Planned Work: WRI will continue to attend stakeholder meetings and conduct outreach as necessary.

3.7 Task 3. Develop Trading Rules and Infrastructure and Implement Program

WRI will work with project team to develop a trading policy for West Virginia pilot project.

Status: In progress

Work to date: WRI has continued to provide comments and input on draft policy.

Planned Work: WRI will continue to provide input and feedback as needed as draft moves forward and becomes final.

4.0 One-Year No Cost Extension Request

A request for a no cost extension of the project was submitted for the following reasons:

1. Although notification of the award was made in August 2006, NRCS did not authorize initiation of work until February, 2007 resulting in a six month delay.
2. The WV Department of Environmental Protection (WVDEP) is phasing in nutrient allocations into NPDES permits upon permit renewal rather than reissuing all watershed permits with nutrient permit limitations. The consequence is that only a portion of watershed NPDES permittees understand their compliance obligations and option for trading. Therefore a strong driver for nutrient trading has not yet developed in the watershed.
3. Although the draft stakeholder trading guidance was completed in September, 2008 we are still waiting for final WVDEP review and approval. A meeting with WVDEP is scheduled for January 15, 2009.
4. Phase 5.2 revision of the Chesapeake Bay model is to be issued in the spring of 2009. The revised model will contain smaller watershed segments and modified sector loadings. It is anticipated that once the revised model is issued significant modifications will need to be made to NutrientNet.
5. The city of Martinsburg, WV has filed an NPDES permit appeal of nutrient load limitations implemented by the WVDEP. Attorneys for Martinsburg argue that WVDEP does not have authority under WV code to require nutrient reductions by point source dischargers. The outcome of this action has the potential to delay implementation of point source nutrient requirements and thereby delay implementation of the Potomac trading program.

5.0 Next six months (February 2009-August 2009)

- **Task 1a.** Develop and submit Targeted Watershed Grant proposal to EPA for funding to evaluate feasibility of expanding Potomac trading program to WV Ohio drainage.
- **Task 1c.** Complete development of NNet-WV for phosphorous and sediment calculations.
- **Tasks 1c and d.** Implement required modifications for *NutrientNet* and demonstrate on model farms with Steering Committee.
- **Task 2.** meet with major point sources and producers to present and assess interest in trading program.
- **Task 2.** Publication of another project article in *Pipelines*, the state Public Service Commission newsletter.
- **Task 2.** Collaborate with Tom Schueler on WV urban stormwater plan for the Bay states.
- **Task 2b.** Continue to develop/update WV Water Quality Trading information website.
- **Task 2/3.** Review final draft trading guidance with Steering Committee and WVDEP.
- **Task 2/3.** Clear WV Trading Policy, Guidance, and Potomac Program guidance through WVDEP and steering committee and post for public comment; assist DEP in responding to public comments.
- **Task 3. Continue** coordination of CIG and Targeted Watershed trading grants – continue participating in riparian buffer/stormwater/wetland project development

Attachments:

Attachment 1: WV Draft Trading Framework Guidance

Attachment 2: Potomac River basin Draft Trading Framework Guidance

Attachment 1
WV Nutrient Trading Guidance

**West Virginia Water Quality Nutrient Credit
Trading Program**

GUIDELINES

The purpose of this document is to provide guidance for the generation and trading of nutrient reduction credits in West Virginia’s river basins. The Department of Environmental Protection (WVDEP) allows the voluntary generation and trading of nutrient reduction credits to meet water quality requirements under applicable laws and regulations. The guidance is also intended to assist individuals through the process of submitting proposals for the approval, certification, verification and registration of credits, and to describe how nutrient reduction credits may be used to fulfill a permit requirement.

The guidance procedures herein are not adjudication or a regulation. This document establishes the framework, within which the Department exercises its administrative discretion to deviate from this guidance if circumstances warrant.

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INTRODUCTION

The Department recognizes the many potential benefits of using market mechanisms to efficiently and effectively address environmental challenges by providing flexibility for the regulated community to meet legal requirements, especially when done on a watershed basis.

Water quality credit trading is one approach to improve and maintain water quality using market mechanisms to produce nutrient reductions at lower costs. Participation in the *voluntary* trading program is an option for point sources to provide for achievement of their environmental obligations by purchasing pollutant reductions from another point source or non point source that can more cost effectively reduce their pollutant discharge. It is also an opportunity for unregulated non point sources who desire to improve water quality (and produce other environmental benefits) to generate nutrient reductions which can be used as tradable credits and sold to others who are seeking nutrient reduction credits.

DEFINITIONS:

“Aggregator/Broker”- *An individual or entity that can collect and compile credits from individual sources. These credits can then either be sold on the credit marketplace, or sold directly to a point source or developer.*

“Baseline”- *The compliance activities and performance standards which must be achieved before an entity can generate credits.*

“Basin” – *The three major river basins of West Virginia include the Potomac, Ohio and James Rivers and their watersheds, subwatersheds and tributaries. See “Watershed”.*

“Best management practice” or “BMP” - *Structural, vegetative, or managerial practices that reduce, minimize, or prevent the discharge of pollutants to waters of the state.*

“Certification”- *The approval, by the Department, of credits generated by a credit development proposal as verified by the Department or a delegated entity.*

“Conservation Plan”- *A farm specific plan, developed by the NRCS or others, that contains information on why and where the practice is applied, and sets forth the minimum quality criteria that must be met during the application of that practice in order for it to achieve its intended purpose(s).*

“Credit” – *The unit of compliance that corresponds with a pound of nutrient reduction per unit time as recognized by the Department which, when registered by the Department, may be used in a trade.*

“Credit Marketplace” - *The credit marketplace is an on-line marketplace that facilitates exchange of nutrient credits among buyers, sellers, aggregators, and brokers by posting guidance, credit prices, the credit registry, and the credit calculator, NutrientNet.*

“Credit Registry” - *The Department’s official system that tracks and records credits needed, generated, and traded among point sources and non-point sources.*

“Credit Reserve” – Credits set aside by the Department to address natural or otherwise unexpected failure of credit generating activities.

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

“Department” - West Virginia Department of Environmental Protection

“DMR” or “Discharge Monitoring Report” - The EPA uniform national form, for the reporting of self monitoring results by the NPDES permittees including any subsequent additions, revisions, or modifications, that may be necessary for the self-monitoring and tracking of credits.

“Non-point Source” – A source of potential water pollution that is not a point source. Non-point source pollution, sometimes referred to as “polluted runoff”, is generally caused by stormwater runoff across the land. Examples of non-point sources include, but are not limited to: agriculture, abandoned oil and gas wells, atmospheric deposition, failing on-lot sewage systems, and silviculture (forestry).

“NPDES” – National Pollutant Discharge Elimination System, the permit program required under the federal Water Pollution Control Act (also known as the “Clean Water Act”), administered by the Department.

“NRCS”- The Natural Resources Conservation Service, a division of the United States Department of Agriculture

“Nutrient” – Nitrogen or phosphorus.

“Nutrient Allocation” - The amount of nutrient discharge allowable by an NPDES permit.

“NutrientNet” – Created by the World Resources Institute (WRI), it provides a web-based interface for administering the trading program by standardizing nutrient reduction calculations, establishing a credit registry and provides for tracking of credits and trades.

“Nutrient Balance” - A component of the Nutrient Management Plan that calculates the total nutrient runoff potential for all farm fields under current land use practices. Where BMPs have been installed and properly maintained the farm nutrient balance shall reflect the nutrient reductions achieved by these practices. Nutrient Net can be used to calculate the farm nutrient balance.

“Nutrient Management Plan (NMP)” – A plan to assist landholders in managing the mass balance of nutrients developed by the WV Department of Agriculture, the WV Conservation Agency, the Natural Resources Conservation Service or another Department-approved entity. A nutrient management plan must be developed in order for agricultural entities to generate nutrient reduction credits.

“Nutrient Reduction”- Reductions of nutrient discharges to waters or of nutrients within waters achieved by activities such as best management practices, application of wastewater treatment upgrades, and activities that quantifiably increase waters’ assimilative capacity compared to the applicable baseline.

“Nutrient Trading” – Transactions that involve the exchange of quantifiable nutrient reduction credits, registered with and approved by the Department.

“Offset”— A unit (equivalent pounds) of nutrient load reduction approved by the Department that can be used by a facility to meet its NPDES nutrient requirements.

“Point Source” – For the purposes of this guidance, any NPDES-permitted discernible, confined and discrete conveyance, including, but not limited to, any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, landfill leachate collection system, or vessel or other floating craft, from which nutrients are or may be discharged.

“Permittee” - An NPDES permit holder with nutrient discharge limits or other nutrient related requirements.

“Point source-point source trade” - A trade in which the person using water quality credits and the person generating water quality credits are both permittees.

“Point source-nonpoint source trade” - A trade in which the person using water quality credits is a permittee and the person generating water quality credits is a nonpoint source.

“Person”- An individual, corporation, organization or other legal entity whose actions or activities contribute to or reduce nutrient loadings.

“TMDL” – Total Maximum Daily Load, a stream segment use designation which is the sum of individual waste load allocations for point sources, load allocations for non-point sources and a margin of safety expressed in terms of mass per time, toxicity or other appropriate measures.

“Third Party”- Any entity that does not discharge nutrients or create nutrient credits and that participates in the trading program to validate and/or inspect credit development proposals. This entity could include, but is not limited to, environmental groups, developers, watershed associations, aggregators/brokers, businesses, and nonprofit organizations.

“Trading Ratios” or “Trading Calculation Factors”- Discount factors applied to nutrient reductions, to account for uncertainty, delivery, credit reserve or special need concerns.

- **“Delivery Ratio” or “Delivery Factor”**- The factor that compensates for the natural attenuation or loss of nutrients as they travel in water.
- **“Reserve Ratio”**- The proportion of the credits generated by a nutrient reduction set aside in the credit reserve for the purposes of insurance against risk of nutrient reduction project failure for natural or unexpected causes.

- **“Special Concerns Ratio”**– Additional ratios applied to credits generated in watersheds of impaired streams (303d-listed) and otherwise as the Department deems necessary in areas of special water quality concern.
- **“Uncertainty Ratio”**– Ratio applied to point-to-nonpoint trades to account for uncertainty in modeling and BMP performance.

“True Up Period”- Two month period at the end of each Credit accounting year during which time permittees may obtain or secure credits needed to meet their compliance obligation.

“Verification”-The process by which the Department determines that a credit represents a real reduction in nutrient loading that is eligible for trading.

“Water quality trade”- The purchase, sale, conveyance or other transfer of a credit from one person to another person.

“Watershed”- An area of land as determined by the Department that drains to any waters of the state which may encompass a large river mainstem or any of its subwatersheds and tributaries. See **“Basin.”**

“Watershed Segment” – A hydrological-based unit of land with a numeric code or Hydrologic Unit Code, utilized by the Chesapeake Bay Watershed Model, which uniquely identifies it and indicates its relationship to smaller and larger watershed/basin delineations.

FUNDAMENTALS

General

Nutrient Trading has the potential to achieve water quality and other environmental benefits more cost-effectively and generate greater economic and environmental benefits than traditional regulatory programs. Nutrient trading under these guidelines must be consistent with legal requirements under applicable laws and regulations, including the federal Clean Water Act, or CWA.

Trading in a broader watershed area must not cause localized water quality impairment. Where a TMDL is established, trading must be consistent with the TMDL and associated implementation plans, approved by the Department.

Nutrients Traded

This guidance deals with the nutrients nitrogen and phosphorus, the principal constituents determined to cause eutrophication of local and downstream waters. The Department lists certain waters overly enriched by nutrients as water quality impaired under section 303(d) of the CWA, however others similarly impacted may not have been adequately documented.

Trading Guidelines

Trading must occur within the same basin. Trading may be limited to smaller watersheds within basins if the Department determines that greater efficiencies can be obtained for implementing a TMDL or for avoiding localized water quality impairment. Interstate trading of nutrient credits may be permissible within the same basin and in compliance with applicable state policies, rules or laws.

Trading can occur among the sources within that basin for that nutrient on the condition that the discharges covered by the trades do not exceed water quality standards and any nutrient cap load established for the basin.

Under this guidance several principles apply throughout: (1) trades must involve comparable parameters (e.g. nitrogen must be traded for nitrogen); (2) trades must be expressed as mass per unit time (e.g. pounds per year); (3) trades can occur only between eligible parties; and (4) credits generated by trading cannot be used to comply with existing technology-based effluent limits except as may be expressly authorized by federal regulations.

Eligibility

Trading may take place between any combinations of eligible point sources and nonpoint sources. Both public and private entities are eligible to participate. Each trading entity must meet applicable eligibility criteria established by the Department for this voluntary program.

Baseline Levels

All sources must meet baseline requirements before additional nutrient reductions will be considered eligible for credit development and trade by the Department. This applies to those activities and performance standards associated directly or indirectly with the pollutants being traded (i.e., nitrogen and phosphorus). More restrictive limits may apply if a TMDL is established, as discussed later in this guidance.

For most **point sources regulated by an individual permit for the pollutant being traded** to be eligible to generate credits the baseline is the more restrictive of any technology based or water quality based effluent limitation or cap load allocation over the applicable time period, expressed in an NPDES permit.

MS4 related urban point source reductions must first achieve “maximum extent practicable” compliance with MS4 NPDES permit requirements to be eligible to generate credits from additional reductions if the reductions fall within the jurisdiction of a permitted MS4 authority.

Where a numeric effluent limitation is not applied, such as in MS4 permits, the permittee is obligated to meet the applicable management requirements to the maximum extent practicable. The discharge must therefore be in compliance with any expressed baseline requirements or management requirements in order to generate tradable credits of nutrient reductions.

For **non-point sources**, baseline is the set of regulatory and or trading program requirements applicable to the credit generator:

a) Agriculture, Currently, WV does not have sector specific regulatory control requirements applicable to agricultural non-point sources. At a minimum a current nutrient management plan must be developed and in-place before credits can be generated. Any additional baseline requirements will be calculated and applied on a basin by basin basis to reflect the specific trading and watershed situation. Case-by-case requirements may be imposed on agricultural operations in areas where runoff impairs surface water quality or where groundwater is declared to be at risk.

b) Forestry, Forestry practices must first comply with W.V. Code 19-1B-5 before credits can be generated.

Process for Generating, Approving and Tracking Credits

The Department is responsible for approving and tracking all credits. A credit generation practice must be approved, and trades must be registered, by the Department under this process before they can be used for NPDES permit compliance.

The Department, or its delegated entity, will use the following elements in its process of approving and tracking the generation and use of credits in the trading program. The process is summarized in the process chart following this section.

Farmland and Open Space Concerns

The Trading Program is not intended to accelerate development of productive farmland or open space. Therefore credits cannot be generated for converting farmland into commercial, industrial or residential developments even though the conversion may result in a reduced nutrient load.

The Department does, however, recognize that farmland and open space will continue to be converted to alternate land uses and encourages and supports the use of sustainable development principles. Therefore, where an investment is made in land development which yields nutrient load reductions beyond traditional development practices (due to implementation of green infrastructure, low impact development, and smart growth practices above and beyond federal, state, county or local legal development requirements) the Department will, on a case by case basis, accept and review proposals for generation of nutrient credits. In scenarios of development of farmland or open space, credits can only be generated from the difference between the enhanced and the traditional/baseline development practices for the same category of land use.

Calculation of Credits

All credit generation calculations must be approved by the Department.

a) Basic calculation. The Department will provide a pre-approved calculation methodology for estimating available credits from various BMP applications. For example, the pre-approved credit calculation methodologies and calculation tool for nutrient trading in the Potomac basin is WV NutrientNet as described in Appendix A. The Department will also consider other scientifically-based calculation approaches, although the proposal review time may take longer.

For non-point sources generally, the Department expects that proposals will contain scientifically-recognized methods to demonstrate nutrient reductions (e.g. methods employed by NutrientNet).

Credits must be expressed in terms that correspond to the unit of compliance (e.g., pounds), and a time period, all specified in the applicable permit discharge limits.

For example, credits will be expressed as pounds per year, and will be valid for one year or longer dependent upon Department approval.

This means that credits need to be measured, verified and accounted for according to the approved time period. For example, if a BMP has a longer lifespan than a year, credits can be generated for the life of the project but may need to be re-verified and must be accounted for each year. This can be accomplished through a request to the Department or through the Department's own initiative. Proposals to generate credits

must include adequate provisions for verification throughout the credit generating life span of the project.

Groups of credits for discrete nutrient reduction activities will be assigned a unique identifier by the Department, and will have a “shelf life” of one calendar year.

Credits cannot be banked for future years. For example, if a BMP generates 100 credits each year and has a life span of five years, 500 credits cannot be applied to a permit in year five. Credits must be applied in the year that they are generated.

b) Application of trading ratios or credit calculation factors. Nutrient reductions must be calculated in a manner that accounts for factors such as location, reserve/risk, uncertainty, and/or other special needs. Trading ratios may need to be considered and used as appropriate to ensure that trading provides the desired level of nutrient reductions and water quality benefits. Examples of ratios that would apply to trades are provided below and their specific application to the Potomac program is explained in Appendix A.

Delivery Ratio is a function of the distance from the location where the nutrient reduction activities are carried out, to the compliance point and the related estimated diminution of the effect of the nutrient reductions between upstream and downstream points.

Reserve Ratio is applied where the Department determines that it is necessary to provide for possible failures in nutrient reduction efforts.

Uncertainty Ratio is applied to point-to-nonpoint trades to account for uncertainty in modeling and variation in BMP performance.

Special Concerns Ratio – Additional ratios may be applied to credits generated in watersheds which the Department deems to be of special water quality concern such as those with impaired streams (303d-listed) and otherwise as the Department deems necessary.

Guidelines for Proposals to Establish Reduction Credits

a) General. All credits generated in this program must be based on proposals reviewed and approved by the Department.

b) Elements Needed for Potential Credit-Generating Projects. The general information normally required for credit proposal submittals is outlined below. Credit certification application forms tailored to specific trading programs will be made available by the Department. To ensure

accuracy the Department or third party will assist the applicant, when necessary, with supplying certain of the following information.

Credit Generator Information

Credit Generator/Producer
Generator Type
Name of Responsible Party
Phone Number/Email of RP
Generator Address
Generator County and State
Generator Zip Code
Latitude and Longitude
Receiving Stream

Watershed Information

Watersheds and Watershed Segment Number for the trading proposal. Specify the “designated use” (e.g., cold water fishery) and any listed impairments.

Current Practices/Baseline Information

Current land use
Currently installed BMPs
Eligibility information
Date practice implemented/completed
BMP units (acres, feet)

Credits to be Generated Information

Reduction: Point or Non-point
Reduction Description
Area of Reduction
Nutrient Reduced
Nutrient Source
Ratios Applied
Quantification Method
Generated Credits
Project Lifespan

Restrictions

Identify if a funding source that was used to pay for a nutrient reduction activity restricted or limited in any way the sale or income from credit generation.

Verification

Describe the method of verification (e.g., records of BMP implementation, nutrient application and crop yields to be maintained by the landowner). Verification may be defined for a trading program or tailored by situation.

Risk mitigation plan

Describe the plan to manage any potential risks of BMPs failure.

Previous efforts

Indicate if any preservation/conservation easements exist on lands where credit generating BMPs are to be implemented.

Ancillary benefits

List any known or anticipated ancillary local benefits that may result from the implementation of the nutrient reduction activity (e.g., source water protection, trout habitat restoration/protection, stormwater flow management, green space protection, green house gas (GHG) reductions, etc.).

Credit-Submitting Entity Information

Submit name, address and contact information for the submitting entity if the proposal is submitted on behalf of the credit generator.

Operation and Maintenance Information

A plan to ensure that the practice will be properly operated and maintained for the life of the credit is required for the credit proposal to be approved.

Proposal Review

a) Proposal Review Process. Proposals will be reviewed by a panel of selected experts, approved by the Department, for technical acceptability, and consistency with program guidelines. For example, for reductions at agricultural operations, experts may include representatives from the West Virginia Conservation Agency, WV Department of Agriculture, and the USDA Natural Resources Conservation Service (NRCS). The Department may identify additional experts as needed. The Department shall attempt to provide a response to the proposal within 60 days.

b) Proposal Approval. Following proposal review, the Department will respond in writing to the applicant with its determination.

If a proposal is not approved, the response will include why the proposed activities will not generate the requested reduction credits

and/or what additional information may be needed from the applicant for credit certification.

The Department will provide public notice of complete proposals for credit generating activities. Approvals of credits and trades of credits will be posted on the Department's Nutrient Trading website including any applicable on-line marketplace (e.g., NutrientNet).

Verification

a) General. Every proposal for use of credits must include a credit sale or purchase agreement which contains a plan for inspecting and verifying the nutrient reductions by a qualified and approved third party professional. The inspector shall have the education, knowledge and experience to determine if the control is properly installed, operated and maintained to achieve the nutrient reductions approved and certified by the Department.

In addition, the Department will use a combination of record keeping, monitoring, reporting, inspections, self-certifications, and compliance audits to further ensure that the credit-generating obligations are being met. The Department will also conduct spot checks of credit generating projects, and the applicant's verification activities, to ensure certified practices and activities are being implemented and properly operated and maintained.

b) Baseline verification. The Department will verify that the generator of the credits meets the baseline requirements of the trading program. This may involve a site visit by Department staff or a delegated entity, self-verification by the generator of the credits by means of a process established by the Department, or a combination thereof. This step must occur before credit approval.

For agricultural operations, baseline compliance will be verified through a site visit or by review of applicable plans such as a Nutrient Management Plan, Erosion and Sedimentation Control Plan, Conservation Plan, Manure Management Plan, or a combination thereof as required by the specific trading program and any applicable requirements. Compliance must be verified by the Department, a Conservation District, or other entity approved by the Department.

c) Nutrient Reduction. The Department, and the generator of the credits, will have a process to verify that the reduction efforts have occurred as planned. The types of verification will depend upon the individual project proposal. Verification may occur at any time during the life of the credit attributed to a particular activity. Examples of verification methods which can be approved for use by project applicants include engineering plans (if appropriate), photographic documentation of the installed BMP or receipts

confirming BMP activities, such as documentation showing the results of a truck that was weighed to haul manure/litter.

d) Operation and Maintenance. The Department, and the generator of the credits, will have a process for verifying that the operation and maintenance of any nutrient reduction efforts are being implemented as planned. The verification process will depend upon the individual project but will be outlined in the credit proposal.

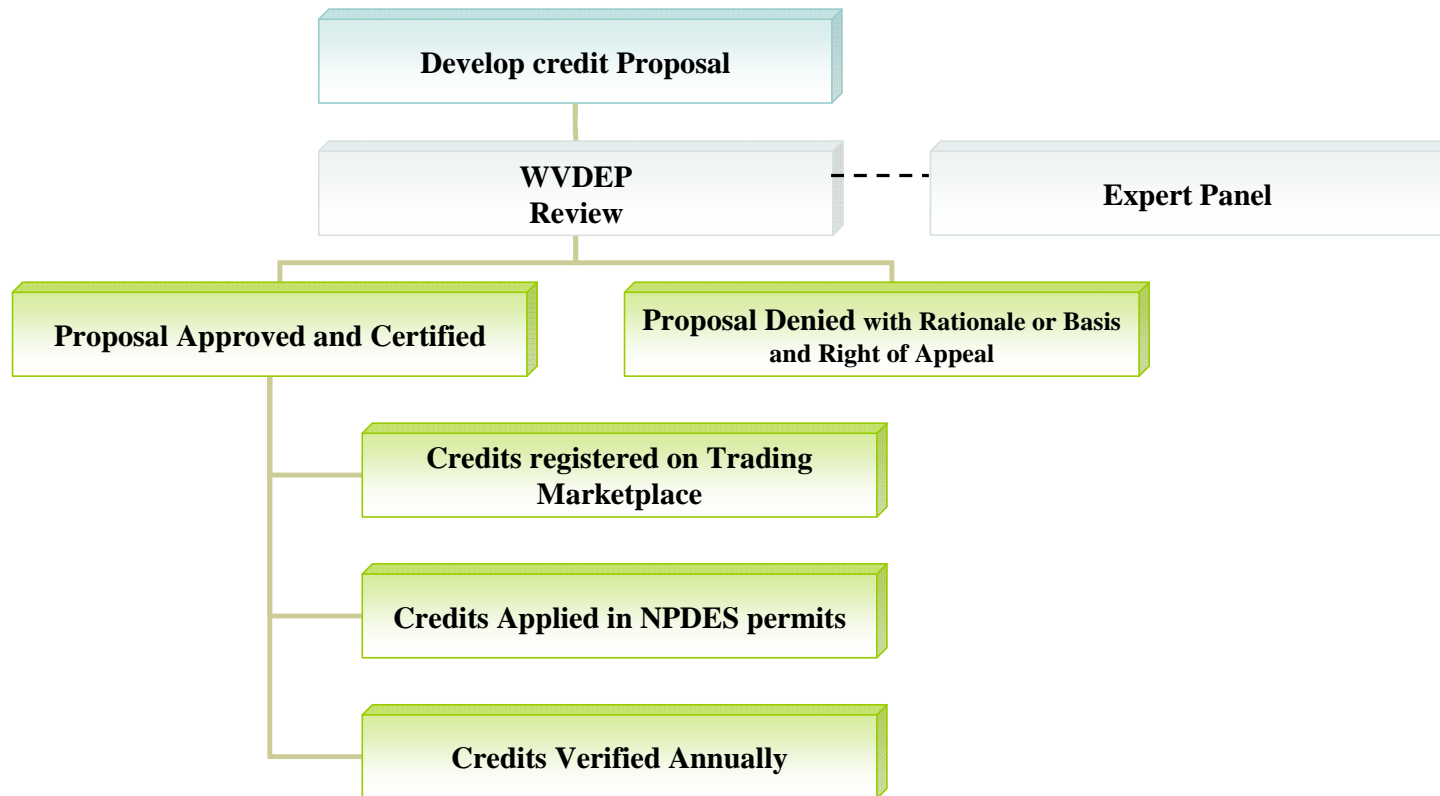
e) Other. The Department may allow qualified and approved third parties to perform verifications on behalf of the Department. For a third party to qualify to verify credits, the Department requires that the party:

- Have the necessary qualifications to perform the verification (e.g., a certified nutrient management planner, technical service provider, soil scientist, conservation planner, registered professional engineer, etc.);
- Provide potential trading partners with information on the program;
- Calculate credits based on the Department's trading guidance;
- Accurately provide the Department with the information listed in the Elements Needed for Potential Credit-Generating Projects;
- Confirm in writing that the activities intended to generate credits have occurred or are scheduled to occur prior to the end of the calendar year.
- Not be in a position to profit directly or indirectly from sale or purchase of credits; and
- Confirm in a certified written statement that the credit-generating entity meets all trading program criteria.

Registration and Tracking

a) Registration and Tracking. Trades must be registered before the credits can be used to meet permit limits. The Department will operate an on-line marketplace tool (e.g. NutrientNet) that will assist with the registration, tracking and application of credits. The registration system will be used by Department staff when credits are proposed to be used in a NPDES permit. The registration system may also be used by buyers and sellers to determine whether credits are available and to verify that their trades have been approved by the Department.

PROCESS CHART FOR GENERATING, APPROVING AND TRACKING CREDITS



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Use of Credits in NPDES Permits

NPDES permittees are authorized under this program to use registered and certified credits to achieve compliance with permit effluent limits under the following conditions:

- Permittees are responsible for ensuring that the credits they obtain and apply to their permits for compliance purposes are approved by the Department (i.e., are certified and registered by the Department).
- Permittees must report in the Discharge Monitoring Reports (DMRs) or in another acceptable form the number of credits that are being applied to achieve compliance with their permit limits.
- Permittees are responsible for assuring adherence to the terms of their credit purchase agreements. Where credits have been procured through a Department-approved broker/aggregator, it becomes the responsibility of this agent to ensure the credit supplier abides by the purchase agreement. Where a credit supplier fails to comply with a contractual agreement resulting in noncompliance with the permit the Department may decertify the credits in question. Permittees can acquire supplemental credits, or in the case of a Department-verified case of credit loss from natural disaster or other unforeseen/uncontrollable causes, credits could be obtained from the credit reserve pool.

The Department may exercise enforcement discretion with respect to permittees in the year in which credits are determined to be invalid, as long as (1) the credit failure is not due to negligence or willfulness on the part of the permittee and (2) the permittee replaces the credits in a “true up” period.

Use of Credits to Offset New and Expanding Discharges

When applicable, in accordance with nutrient reduction requirements of the relevant facility NPDES permit, permittees are required to obtain credits to offset all nutrient loadings from all new or expanded sources.

Public Participation

The Department will operate a transparent system for review and approval of credits by providing notice to the public and for comment on the use of trading in permits as part of routine procedures followed with all NPDES permit actions and as required under the regulations governing NPDES permits.

The Department will make reference in the public notice of any trading proposal in the draft permit or in any required necessary major modification of the permit.

DMRs and/or other Department-approved forms are records that can be accessed by the public. The information in these documents must include unique identifiers and the numbers of credits purchased. More detailed information about the credits can then be accessed from the Department’s Nutrient Trading website.

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An inventory of credits developed, credits available and credits transacted is public information and will be published on the Department's Nutrient Trading website and the on-line marketplace (NutrientNet).

Ensuring Program Integrity and Managing for Success

The Department recognizes that there are factors of uncertainty and risk in the ultimate success of nutrient reductions that are to serve as the basis for tradable credits. This uncertainty and risk will be addressed in several ways:

- a) We have established in this guidance that a baseline is necessary before you can trade. Uncertainty is accounted for in the calculation of ratios applied to point-to-nonpoint trades.
- b) Conservative assumptions. The Department will use conservative assumptions and methodologies for calculating credits. In the Potomac, these assumptions have been employed within NutrientNet credit calculation methodologies (see Appendix B). The Department will continue to confer with experts in agronomics and other specialized areas in order to employ the best available science when applying its credit calculation protocols.

As well, trading ratios will be applied to account for uncertainties inherent in estimating the delivered loads and reductions in the absence of daily site or stream monitoring and other cost-prohibitive measures. Despite conservative estimation methodologies, remaining uncertainty can include but is not limited to estimating the effect of temporal, spatial, and water quality factors specific to reductions that cannot be captured by models and methodologies - these uncertainties can include the variation in annual/seasonal weather, in the fields and crops, in human practices, in receiving streams, in the estimation of past loadings, and in the equivalency of various forms of pollutants (e.g. bound vs. biologically available phosphorous).

- c) Reserve Ratio. The Department will adjust all load reductions available for credit generation to populate an annual risk reserve of credits to be used in the event of natural or otherwise unforeseeable/uncontrollable causes of project failures.
- d) Verification. The Department and/or its agents retain the right to conduct audits or verifications of baseline and reduction activities/technologies. The Department will also require a level of monitoring and verification of the point sources using credits for permit compliance, or their agents, to ensure the integrity of credit generating activities. Sampling and other monitoring will be conducted where/when appropriate.

For instance, the Department regularly conducts water quality monitoring at monitoring stations throughout the state, and this data can be used to evaluate any impacts from use of trades in NPDES permits. It should be noted that the data derived from water quality monitoring sites within the Chesapeake Bay drainage

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area is provided to the EPA Chesapeake Bay Program to help calibrate the model and evaluate changes in nutrient loadings over time.

- e) Transparency. A registry of credits generated and verification records will be maintained and made publicly available as part of the NPDES permit process.
- f) **Other.** The Department will evaluate trading programs and their progress at least every five years or more frequently if the Department deems appropriate. Based on these reviews, the Department may determine program enhancements are needed and the appropriate changes can be made. These may be shown on the Department's Nutrient Trading website. Stakeholder input will be obtained prior to the changes, as appropriate.

Program Organization

Trading programs will be a joint effort between the Department and a Department-approved trading program management organization (e.g., Conservation District staff).

- a) Credits will be approved and certified by the Department through consultation between the Division of Water and Wastewater Management and additional experts as appropriate.
- b) Verification may be coordinated by the Department, the buyer, and or an aggregator/broker but in most cases will be conducted by the approved trading program management organization.
- c) Registration of credit generation approvals and trades will be managed by the NPDES Permitting Office, in coordination with the approved trading program management organization.
- d) Registration and use of credits in permits will be managed by the NPDES Permitting Office.
- e) Public participation during the permit process will be the responsibility of the NPDES Permitting Office.

Water Quality and TMDLs

Trading will be allowed only where water quality will be protected and maintained as required by applicable regulations.

- a) TMDLs. Once a TMDL is approved by EPA, any load allocations and individual waste load allocations established by the TMDL to meet local water quality standards apply. This may mean that additional "baseline" requirements must be implemented before credits can be generated. Trading will be consistent with the assumptions and requirements upon which the TMDL is based.
- b) Antidegradation. Trading will be consistent with the antidegradation requirements contained in Department regulations.

Attachment 2
Potomac Specific Nutrient Trading Guidance

APPENDIX A
West Virginia Potomac River Basin
Water Quality Nutrient Trading Program

Purpose: The purpose of Appendix A is to provide program specific guidance regarding water quality trading of nutrients in the West Virginia portion of the Potomac River Basin.

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Definitions

“Cap Load Allocation” *The total allowable load of nutrients that can flow from a basin within the Chesapeake Bay watershed that is based on protection of downstream water quality.*

“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 nutrients and sediments within the Chesapeake Bay watershed.*

“Chesapeake Bay Watershed”- *The area of land defined by the aerial extent of surface water which drains to the Chesapeake Bay and its tributaries.*

“Delivery Factor” or DF- *The portion of the nutrient load that is expected to be delivered from the watershed segment to the fall line of the Chesapeake Bay.*

“Edge of Segment Factor” or EOS – *A factor that represents the fraction of the nutrient load originating from a given land use type that is delivered from the field (via runoff, groundwater and atmospheric deposition) to the edge of the corresponding stream segment. Segment soil types, topography, hydrological, and land use characteristics of each WV Chesapeake Bay Model watershed segment are considered.*

“Edge of Segment Baseline”- *The 2007 Edge of Segment nutrient load calculated by the Chesapeake Bay Watershed Model. This is the level of performance on a specific field that must be achieved before nutrient credits can be generated.*

“Edge of Field Baseline”- *The Edge of Field target load from the Chesapeake Bay Watershed Model calculated by dividing the EOS baseline by the Edge of Segment Factor.*

“West Virginia Potomac Basin”- *The area of land within West Virginia that drains to the Potomac River and its tributaries.*

“West Virginia Tributary Strategy Implementation Plan” – *The Plan written by the WV Department of Environmental Protection and stakeholders to help define and address nutrient and sediment loadings in the WV portion of the Potomac Basin.*

Background

The Chesapeake Bay and its tidal tributaries have been determined by Maryland and Virginia to be impaired under Section 303 (d) of the CWA. As nutrient sources in West Virginia contribute to this impairment, West Virginia became a partner in the Chesapeake Bay Water Quality Initiative (CBWQI) in 2002 by signing a document committing cooperation and efforts to protect and restore the Bay and its tributaries - joining a multi-jurisdictional effort to restore ecological functions within the Bay watershed which have been degraded by excess nutrients and sediment loads. In accordance with the 2002 CBWQI, each jurisdiction within the Chesapeake Bay watershed (WV, VA, PA, DE, Washington DC, MD, and NY) was to develop its own Tributary Strategy^[1] and Implementation Plan^[2] that would outline steps and goals for achieving agreed upon cap load allocations (CLAs) for nutrient and sediment loads by 2010. This was done as an effort to avoid a mandated EPA TMDL for the Chesapeake Bay watershed.

Implementation of these strategies supports commitments associated with the CBWQI as well as compliance with Clean Water Act (CWA) requirements, which mandate that states assure the attainment and maintenance of downstream water quality standards--in the case of WV, this results in the inclusion of permit conditions for dischargers of nutrients in the Potomac Drains that provide for the protection of Maryland water quality standards including those applicable to the Chesapeake Bay.

West Virginia voluntarily committed to reducing nitrogen, phosphorus and sediment loadings to the Potomac River by 33, 35, and 6 percent respectively over 1985 loading rates. The Strategy and Plan further include specific initiatives to address loading reductions from both point and non-point sources. Reductions are needed in the Potomac Basin in the regulated point source sector (e.g., sewage treatment plants, industrial dischargers, regulated MS4s) and in the non-point source sector (e.g., farms, forestry, and unregulated urban stormwater runoff) to achieve EPA allocated levels.

The Strategy describes how the state can achieve its nutrient load allocation through a combination of actions, including changes to NPDES permits and other activities such as installation of best management practices.

In support of the state's voluntary commitments and in anticipation of an impending Bay-wide TMDL, WVDEP is providing guidance for this water quality related nutrient trading program. The trading program was one of the innovative measures outlined as a part of the CBWQI and recommended by WV's Point Source Innovation Work Group, a group formed by the Department for initiating the permitting framework. This measure is just one part of a larger program to help sources in all sectors take preventative and proactive measures to achieve cost effective reductions in nutrient loadings that will improve and protect local water quality and help meet WV's commitment to reduce nutrient loads to the Potomac Basin. Most importantly, the water quality trading guidance outlined here is designed to ensure that WV's local goals for economic development, environmental and public health protection, and soil conservation are advanced through efforts to also restore and protect the Bay.

Fundamentals

General

The Environmental Protection Agency (EPA) advocates water quality (nutrient) trading as a cost effective approach to achieve water quality goals that will increase overall environmental and economic benefits. In the Bay watershed nutrient trading programs have been adopted by Pennsylvania and Virginia, and Maryland's program is currently being finalized. Although the specific criteria of these programs differ, all programs, including the WV program rely on trading to benefit the states in two principal ways. The first is the expected cost difference for some facilities between upgrading treatment technology of point sources versus other approaches for reducing nonpoint source discharges. The second is the policy flexibility in trading that allows for future economic development and growth to take place without sacrificing water quality.

Nutrients Traded

Trading may occur for nutrient (total phosphorous and total nitrogen) credits. Credits are the units of compliance that correspond with a Department-recognized nutrient load reduction, instream nutrient load removal, and/or unused nutrient allocation which, when registered by the Department, may be used in a trade to offset a permittee's increase in a nutrient load beyond its permitted nutrient allocation.

Trading Guidelines

Credits must be expressed in units of compliance needed for applicable permit compliance requirements. Nutrient credits will be expressed as delivered pounds per year, and will be valid for one year for trading in the context of the WV Potomac Basin. Credits must be measured, verified, and accounted for according to that time period.

Credits must be verified each year. If a credit-generating project has a longer life span than a year, then credits can be generated for the life of a project but they must be verified each year. Credits cannot be banked for future years but must be applied in the year that they are generated. Projects with variable credit production capacity, however, can generate credits that reflect average performance (e.g. forested riparian buffer strips).

For example, if an agricultural BMP generates an average of 10 credits per year and has a life span of five years, 50 credits cannot be applied in the fifth year.

Credit Trading may occur anywhere within the West Virginia portion of the Potomac Basin. But no trade may cause an impairment of any local water quality.

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

- Point sources;
- Non-point sources;
- Aggregators/Brokers;
- Any combination of the above.

Eligibility

Sector Trading Caps & Baselines

In the WV Potomac Tributary Strategy, various land use sectors were estimated to be contributing a nutrient load to the Potomac Basin. Using this initial estimated load, goals to reduce each sector's load by a certain amount are also described in the Tributary Strategy. The post-reduction loading levels are the nutrient loading caps that each sector/the state is responsible for obtaining and maintaining.

These load reduction goals are intended to be implemented across all sources. For point sources, regulatory efforts initially address point source sector permittees with design discharge flows of 50,000 gallons per day or greater. Other sector strategies are being implemented through different types of programs. For the purposes of the trading program, a party without permitted nutrient load restrictions that is interested in credit generation must demonstrate that it is also contributing to sector reductions and cap maintenance efforts as defined below. It is important to the integrity of the trading program that efforts intended to advance water quality goals not become credits that simply increase nutrient loadings elsewhere without resulting in a net load reduction. It is also important to the integrity of the trading program that efforts to reduce nutrient loads to achieve water quality goals not violate water criteria locally.

The point at which an entity can begin to generate credits is its baseline. The baseline for all sectors is defined in the sections below.

Point Source Sector Baselines

Regulated facilities in the municipal point source sector have or will receive annually applied nutrient allocations in their NPDES permits based on Department-selected effluent concentrations for the facility multiplied by the facility's permitted design flow as of November 2005. New facilities or expansions permitted after November 2005 are required to offset all new nutrient loads.

Targeted industrial and mining operations receive similar limits based on equivalent levels of nutrients as facility permits are reissued. To be eligible to trade, any facility must have and be in compliance with an NPDES permit nutrient allocation for nitrogen and/or phosphorus.

b) <50,000 gpd *Reserved*

Other Point Sources - Where a permittee does not have a nutrient allocation, such as in the general MS4 permit, the permittee is obligated to meet the applicable monitoring, reporting, and management requirements to the maximum extent practicable. Dischargers must be in compliance with the expressed monitoring, reporting, and/or management

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requirements before the permittee is eligible to generate tradable credits from nutrient reductions.

Non-Point Source Sector Baselines

Non-point sources are not currently regulated by the Department and therefore do not have a regulatory nutrient baseline. The NPS sector reductions contemplated by the Tributary Strategy are to be achieved by application of voluntary conservation practices by individual landowners, many of which can be funded by state or federal cost share or grant programs. The Department has decided, however, that a baseline performance must be achieved to ensure the credit supplier's contribution toward meeting nutrient reduction goals before credits can be generated, certified, and registered by the Department for sale or exchange to help meet another entity's regulatory obligations.

The baselines below may change based on future requirements set forth in any applicable TMDL or state nutrient criteria.

Agricultural Sources Baseline Requirements-The baseline eligibility requirement for agricultural sources is the more restrictive of 1) any existing regulatory requirements or effluent limits related to nutrient management or 2) implementation of a whole-farm Nutrient Management Plan *and* an average per acre nutrient load for the field or livestock production area where credits are being generated based on the edge of field (EOF) nutrient load goal for the specific land use (*high and low till, hay, pasture and manure*) in the specific Chesapeake Bay Model segment.

The table below specifies the nitrogen and phosphorous performance level (EOS Baseline in lbs/ac) that must be achieved in the five land use categories (high and low till pasture, hay and manure) before nutrient credits can be generated.

These baselines are based on an average of estimated Chesapeake Bay Model EOS nutrient loadings across all WV Potomac basin watershed segments representing existing land use and practices as of 2007.

Agriculture Land Use Baselines (lb/ac)

<i>Land Use</i>	<i>Total Nitrogen</i>	<i>Total Phosphorus</i>
Hay	5.2	0.5
Hi-till	19.4	1.7
Low-till	18.9	1.2
Manure	351.7	36.8
Pasture	6.7	0.7

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Agriculture Nitrogen Baseline

Comment [r1]: deleted

Agriculture Phosphorus Baseline

Comment [r2]: deleted

Compliance with the baseline requirement can be determined and verified with the use of Department-approved calculation methodologies available via NutrientNet, an online tool, and through a site visit by Department staff or a Department –approved certified nutrient or conservation planning specialist.

Urban/Mixed Open- For this category and for entities with nutrient allocations resulting from a TMDL or other specified performance requirements, the trading baseline is the more restrictive of the nutrient load associated with existing land uses as of 2005 (the date of the final WV Tributary Implementation Plan) or management practices needed to comply with applicable state or local regulations.

Farmland & Open Space Concerns

The Trading Program is not intended to accelerate industrial, commercial or residential development of productive farmland or open space. Therefore, credits cannot be generated for converting farmland into commercial, industrial or residential developments even though the conversion may result in a reduced nutrient load.

However, the Department will allow the generation of credits when sustainable development practices are applied to the same land use. For example, a municipality can generate credits for retrofitting an existing development with innovative stormwater practices that reduce nutrient loading. Similarly, a developer can generate credits by employing sustainable development practices (green infrastructure, low impact development, and smart growth practices above and beyond federal, state, county or local development requirements) that can be demonstrated to reduce nutrient runoff beyond what would occur under traditional development practices. Credit generation proposals for these type of activities should be developed on a case-by-case basis with the Department.

Generating Tradable Nutrient Credits

Eligible activities for generating credits

Nutrient load reduction activities beyond baseline requirements are eligible for credit generation.

Point Sources

Nutrient-Regulated Point Sources - For a permitted source with a nutrient allocation to generate nutrient credits, it must discharge at levels below its nutrient allocation stated in the NPDES permit. Credits are based on the difference between the permit limit and discharge level reported with the DMRs deemed to be representative by the Department of average discharge loads and adjusted with relevant factors in section IV.C. below.

Existing nutrient related facilities *with design flow less than 50,000 gallons per day* – These facilities represent a nutrient load which may be used for offset and/or trading purposes. On a case-by-case basis, these facilities will be assigned an average annual nutrient load which would provide opportunities for new and expanded non-significant and/or significant facilities to use as offsets for increased nutrient loads.

Once the Chesapeake Bay Total Maximum Daily Load (TMDL) is developed all facilities with design flows less than 50,000 GPD may be assigned nutrient loading limits commensurate with the TMDL and may be required to obtain offsets.

For MS4s, the six Minimum Control Measures in the MS4 general permit must be attained before other activities are eligible to generate credits (e.g. increasing nutrient assimilative capacity or using wetland treatment at outfalls, investing in nutrient removal efforts on public lands, etc.). Such activities must be proposed and will be reviewed on a case by case basis by the Department.

Non-point Sources

For non-point sources, nutrient reduction proposals must contain Department recognized methods to demonstrate nutrient reductions that occur from activities that reduce nutrient application, or increase nutrient uptake and retention, or result in net export of nutrients from the watershed. Currently, all approved Chesapeake Bay Program BMPs are eligible to generate credits. A current list of approved activities in West Virginia is available on the Department's trading program website.

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Where Department-recognized methods for a nutrient reduction activity do not exist, methods can be proposed for Department approval.

Credits can be generated on an annual basis from nutrient management practices such as no till, cover crops, enhanced nutrient management planning conservation easements and protections such as forested riparian buffers and stream fencing, etc. in the year they are generated regardless of what year the practices were first initiated.

Calculation of Delivered Load

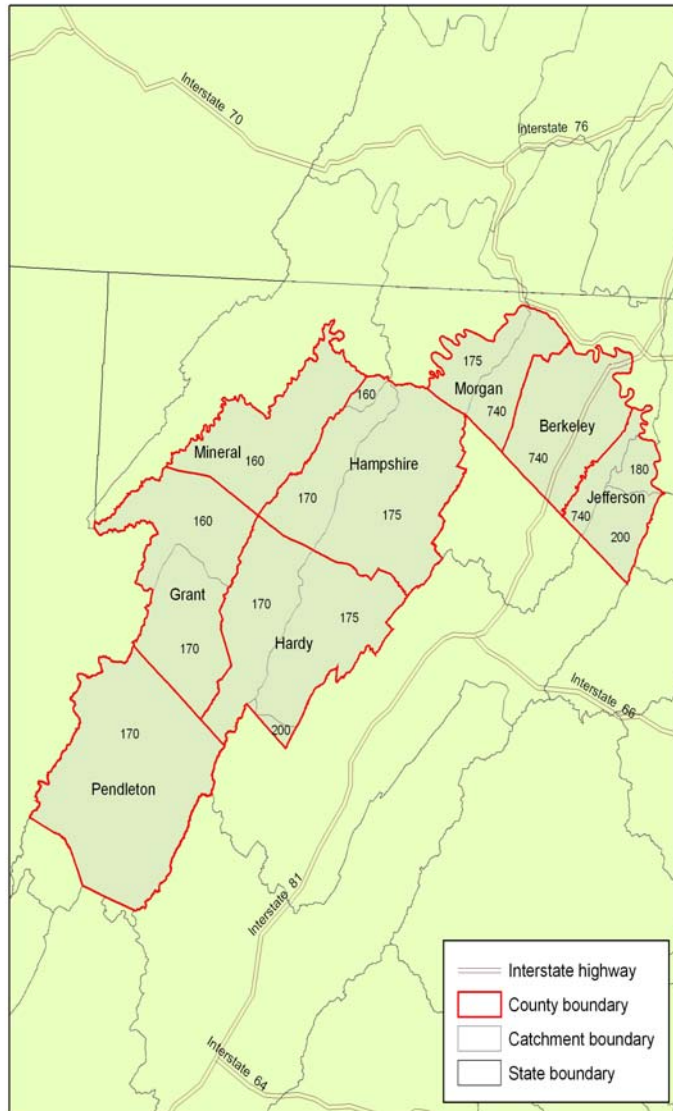
To calculate the number of credits that can be derived from nutrient reduction activities, the factors below are used. These factors serve to translate how various activities on a parcel of land result in a delivered nutrient load reduction and are automatically calculated in the Nutrient Net online forms (for nutrient reduction activities not included in the Nutrient Net program, the Department may be willing to review and approve alternative methodologies).

Segment Factor (SF)

The Segment Factor is a factor that represents the fraction of the nutrient load originating from a given land use type that is delivered (via runoff, groundwater and atmospheric deposition) to the edge of the corresponding watershed segment. This factor also accounts for average soil types, topography, hydrology, land use, and other factors within the segment. The SF is derived from the Chesapeake Bay Watershed Model and included in the NutrientNet calculation tools. The WV Potomac River watershed segments used in the Chesapeake Bay Model are depicted on the following figure.

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West Virginia Counties and Subwatershed Segments
Within the Potomac Watershed



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Delivery Factor

The Delivery Factor is a function of the distance from the edge of the watershed segment and the fall line of the Chesapeake Bay. It represents the effective delivery of the nutrient load to the Chesapeake Bay and the related estimated diminution of the effect of the nutrient reductions between upstream and downstream points. The delivery factor is derived from the Chesapeake Bay Watershed Model and included in the NutrientNet calculation tools.

Calculation of nutrient credits from relevant activities

Point Source

Nutrient-Regulated Point Sources - For a nutrient-regulated point source to generate credits, it must discharge at levels below its nutrient allocation stated in the NPDES permit. Credits generated are based on the difference between the permitted nutrient allocation and discharge level monitored and reported in the DMR. Therefore, the number of credits that are either needed for purchase or for sale are calculated by determining the difference between the permit limit (lbs) and the discharge level (lbs). Point sources with available credits for sale will provide the quantity to the Department who will verify them and list them on NutrientNet.

Other Point Sources (Package Plants)- A point source without nutrient limits can also generate credits. Credits for such facilities can be calculated by the difference between the existing discharge level and the level achieved by upgrading treatment or taking the facility off-line.

MS4s must fulfill their SWMP submitted to the Department for how they will meet the six minimum control measures in the state general permit.

Each of these point sources generating credits must apply the delivery factor.

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Non-point source

- a. Agriculture – Agricultural sources can generate nutrient reduction credits by implementing activities on their fields or animal concentration areas that reduce nutrient loads to ground and surface water. In order to generate credits, these activities must result in an average per-acre load below the stipulated baseline. The Department’s on-line automated calculation methodology, NutrientNet, it will calculate the initial nutrient loading rate for the acreage and apply the relevant segment factor, delivery factor and BMP efficiency to estimate nutrient credits resulting from installation of the practice(s).

The following five steps are used within NutrientNet to calculate credits:

Step 1: The Farmer enters site-specific information about their farm (e.g., crop type, amount and type of manure applied, manure application method, current best management practices, etc.)

Step 2: NutrientNet automatically calculates a “Nitrogen Balance” on the field depending on information the farmer has entered about their farm. A “Nitrogen Balance” subtracts the nitrogen outputs of the cropping system (i.e. crop uptake of N) from the nitrogen inputs to the cropping system (i.e. amount of fertilizer applied) and adjusts for current best management practices.

Step 3: The Farmer selects one or more best management practices that they plan to implement on the farm. NutrientNet calculates the estimated nitrogen reductions using the Chesapeake Bay Model BMP efficiencies.

Step 4: The estimated nitrogen reductions are multiplied by the Chesapeake Bay Model’s Edge of Segment (EOS) factor to adjust for nitrogen impacts to the stream. The Edge of Segment factor is a ratio that estimates the amount of nitrogen that travels from the edge of the farming field to the edge of the watershed model segment.

Step 5: The “EOS Nitrogen Reductions” calculated in Step 4 are multiplied by a Chesapeake Bay delivery factor to adjust for nitrogen impacts to the Chesapeake Bay. The Chesapeake Bay Delivery Factor is a ratio that estimates the amount of nitrogen that travels from the watershed segment to the Chesapeake Bay.

- b. The Department may consider other calculation approaches for practices not included in the NutrientNet program.
 - b. Urban/Mixed Open(U/MO)– Reductions from land in this category of land use can generate credits using calculations based on the Chesapeake Bay Model and applying relevant Segment and Delivery factors.

- c. Other - Credit generation by other non-point sources and other innovative nutrient removal projects to increase nutrient uptake/increase nutrient assimilation and retention (such as algal scrubbers and floating islands) will be evaluated on a case by case basis. If the Chesapeake Bay Program has already determined effectiveness/efficiencies or methodologies for the practices in question, alternatives will only be

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considered with justification and upon approval of the Department. .
Relevant calculation factors will be determined on a case by case basis.

Use of Credits in NPDES Permits and Trading Ratios

Department approved and registered credits may be used by NPDES permittees to comply with permit requirements. For a nutrient regulated point source to apply available credits as offsets to plant loads in excess of permitted nutrient allocations, the facility must apply the appropriate ratios as described in this section.

Trading Ratios

Reserve Ratios set aside a percent of load reductions to be held in a “Credit Reserve.” Similar to risk or crop insurance, this Reserve covers permittees’ obligations in the event of natural or the otherwise uncontrollably-caused failure of credit generating activities. The reserve ratio applies to all credits generated. This ratio may be adjusted by the Department to ensure program integrity.

Uncertainty Ratios are an allowance for the relative uncertainty in the relationship between credit generation efforts and actual resulting nutrient reductions in local waters and ultimately the Bay – this accounts for uncertainties related to the absence of monitoring data and the challenge of estimating how individual actions affect stream loads over time and space. For example there is uncertainty in estimation of initial loadings, the load reduction effectiveness of various BMPs, the delivery of the nutrients to the nearest stream and across watersheds.

Special Concerns Ratio – Additional incentives or ratios may be applied to credits generated in watersheds which the Department deems to be of special water quality concern such as those located on impaired or high quality streams and/or their tributaries.

Application of Ratios

1. Credits generated by all non-point sources and MS4s will be used by NPDES permittees at a ratio of 2:1 – for each pound of nutrient discharged above permit levels, the permittee must purchase two credits of non-point source reductions. This accounts for both the risk reserve (0.3) and uncertainty (0.7) inherent in the generation of NPS credits.

2. Credits generated by ***nutrient-regulated point sources*** **must** be used by NPDES permittees at a ratio of 1.1:1 – for each pound of nutrient discharged above permit levels, the permittee will be required to purchase 1.1 credit pounds of point source reductions. This accounts for the risk reserve (0.1).

3. Credits generated by regulated ***point sources without nutrient requirements*** can be used by NPDES permittees at a ratio of 1.5:1 – for each pound of nutrient discharged above permit levels, the permittee is required to purchase 1.5 credits of point source reductions to account for risk 0.3 (Reserve Ratio) and the increased level of uncertainty 0.2 (Uncertainty Ratio) associated with this category of point sources due to the inadequate history of nutrient monitoring data.

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A nutrient regulated point source may take measures to control or eliminate discharge from an unregulated wastewater point source in order to increase its own nutrient allocation. For example a PSD may choose to control the discharge from an existing package treatment plant or on lot sewage disposal system. The PSD could claim credits from absorbing an unregulated point source at a ratio of 1 pound credit to every 1.5 pound load eliminated.

4. Point Source “Early Buy-in” Incentive. During the period between <<DATE the guidance is finalized>> until any final TMDL is developed, point source dischargers have the opportunity to buy into the trading program in exchange for a reduction in the trading ratio from 2:1 to 1.5 to 1 for the purchase of credits from nonpoint sources. The fees for early buy-in are as follows:

- > = .4 mgd dischargers- \$15,000
- < .4 mgd dischargers-\$4,250

The funds obtained from this provision will be used to implement conservation practices in the Potomac basin thereby providing capital for the trading program.

	Source	Credit calculation factors			Trading ratios		
		Baseline	Segment (calculated by CBM)	Delivery (calculated by CBM)	Uncertainty	Reserve	Total
<i>Point-Source</i>	>=50,000 gpd	Permitted nutrient load	N/A	Yes	N/A	0.1	1.1:1
	<50,000 gpd	Existing load	N/A	Yes	0.2	0.1	1.5:1
	MS4	Permit requirements	No	Yes	0.4	0.1	2:1
	Nutrient assimilation (projects designed for nutrient removal e.g. algal scrubbers, floating islands, etc)	- 0 -	Project by project	Yes	Project by project	Project by project	Project dependent

Comment [r3]: See segment factor-.B.1, p 12 above

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<i>Non-Pt Source</i>	NPS Agriculture	Farm-wide Nut. Mgt Plan & attainment of average field or practice area load in accordance with EOF Baseline	Yes	Yes	0.4	0.1	2:1
	NPS Urban/Mixed (non-MS4)	Legal compliance with any federal, state, and/or local codes and an average per acre load.	Yes	Yes	0.4	0.1	2:1
	Septic	3.4 lbs N/person/year. (per CBF Nitrogen Calculator)	Yes	Yes	0.4	0.1	2:1

Monitoring and Evaluation / Risk Allocation

The Department enforces permit limits through established Departmental compliance procedures. The Department also helps to ensure the effectiveness and validity of the credits used in NPDES permits. This includes the use of (1) methodologies to calculate credits before approval, (2) verification processes and requirements, and (3) the credit reserve.

Permittees must ensure the credits satisfy their permit conditions. Permittees are responsible for ensuring that the credits they obtain and apply to their permits for compliance purposes are certified and registered by the Department. Permittees are responsible that the terms of their credit purchase agreements are met, when needed to ensure compliance with their permit. In the event that nutrient reduction activities fail due to uncontrollable or unforeseeable circumstances such as extreme weather conditions, timely notice must be provided to the Department and Reserve Credits may be applied for the purposes of permit compliance. The Department plans to exercise enforcement discretion with respect to permittees for the year in which credits are determined to be invalid, as long as (1) the credit failure is not due to negligence or willfulness on the part of the permittee or credit supplier and (2) the permittee replaces the credits for future compliance periods.

Additionally the Department provides permittees a “true up” period at the end of each accounting year to generate or purchase credits needed to meet their compliance obligation due to credit failures not related to natural disaster or risk or due to unexpectedly higher discharge annual average discharge volumes or effluent levels. This period extends for two months from the end of the credit accounting year.

Documenting Credits and Trades

The Department, using approved methodologies, must approve all credit calculations, credit and trade registries, and credit tracking activities. This information is public and current information will be available on the Department's Nutrient Trading website and the on-line marketplace (NutrientNet). All credits must be registered before they can be used to meet permit limits.

The marketplace tool may also be used by buyers and sellers to verify that their trades have been approved by the Department.

The Department may provide guidelines for acceptable contract terms and a model trading contract, purchase agreement or a list of certain essential elements of a trading contract in the future if deemed necessary.

Ensuring Program Integrity and Managing for Success

The Department recognizes that there is some level of uncertainty in the ultimate success of nutrient and sediment reductions that serve as the basis for tradable credits.

The Department will evaluate the program at least every five years or more frequently if deemed appropriate. Based on these reviews, the Department may determine program enhancements are needed and the appropriate changes will be made. These will be shown on the Department's Nutrient Trading website. Stakeholder input will be obtained prior to the changes, as appropriate.

Hypothetical Examples of Credit Calculation and Trades

NPS Credit Calculation Example

A farmer located in Chesapeake Bay Watershed Model Segment 740 currently plants 100 acres of corn by conventional till. He decides to implement a cover crop on this field to generate nutrient credits.

Nitrogen Credit Calculation:

Given:

Acres: 100

Edge of Segment (EOS) Delivery Factor: 0.21 (Chesapeake Bay Watershed Model)

In-Stream Delivery Factor: 0.74 (Chesapeake Bay Watershed Model)

Risk Reserve factor: 10% (Potomac Guidance)

Uncertainty factor: 40% (Potomac Guidance)

Current Nitrogen Loading Rate: 30 lbs/acre/yr (as determined by NutrientNet)

Cover Crop Nutrient Reduction Efficiency: 45% (as given by Chesapeake Bay Program)

Calculation:

Step 1: Current nitrogen load =

$100 \text{ ac} \times 30 \text{ lbs/ac/yr} = 3,000 \text{ lbs/yr}$ (calculated by NutrientNet)

Step 2: BMP implementation reduction =

BMP efficiency \times current nitrogen load

$45\% (3,000 \text{ lbs/yr}) = 1,350 \text{ lbs/yr}$

Step 3: Calculated delivered nitrogen loading reduction =

BMP implementation reduction \times EOS delivery factor \times in-stream delivery factor

$(1,350 \text{ lbs/yr} (0.74)(.21)) = 283 \text{ lbs/year}$

Step 4: Apply trading ratios

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Delivered nitrogen load reduction – (Delivered nitrogen reduction x risk reserve factor) –
(delivered nitrogen reduction x uncertainty ratio)
 $283 - (283 \times 0.1) - (283 \times 0.4) = 141.5$

Number of credits = 141.5

Point to Point Source Trade Example

Two point sources in the Potomac basin would like to benefit by participating in the trading program. Point source A is currently exceeding its nutrient allocation; Point source B is discharging below its nutrient allocation either because it has installed nutrient removal technology or because it is discharging below its design flow.

Given:

Source A

Bay Watershed Model Segment Location: 740

Delivery Factor: 0.74

Current TN Loading: 50,000 lbs/yr

Permitted Loading (5mg/l @ design flow): 25,000 lbs/yr

Source B

Bay Watershed Model Segment Location: 180

Delivery Factor: 0.83

Current TN Loading: 100,000 lb/yr

Permitted Loading (5mg/l @ design Flow): 150,000 lbs/yr

Risk Reserve Ratio: 10%

Credit Calculation:

Source A

Difference between current loading and permitted loading = $50,000 - 25,000 = 25,000$ lb/yr

Application of delivery factor = $25,000 \text{ lbs} \times 0.74 = 18,500$ lbs (credits needed)

Source B

Difference between permitted and current loading = $150,000 - 100,000 = 50,000$ lbs

Application of delivery factor = $50,000 \text{ lbs} \times 0.83 = 41,500$ lbs

Application of risk reserve ratio = $41,500 \text{ lbs} - (41,500 \text{ lbs} \times 0.1) = 37,350$ credits

Sources A and B would work out a trade agreement and then register the trade on the Department's website.

Point to Nonpoint Source Trade Example

A point source in watershed segment 740 is exceeding its nutrient allocation and would like to purchase credits from local farms to achieve compliance. The transaction is intended to lower the cost of compliance for the point source, provide funds to the farmers to install BMPs thereby benefiting local water quality and helping the state reduce nutrient and sediment loadings to the Bay. Farmers also located in watershed segment 740 choose to form a co-op and plant cover crops on 1000 acres of fields currently under conventional tillage.

Given:

Source A-Farm co-op

Acres: 1000

Edge of Segment (EOS) Delivery Factor: 0.21 (Chesapeake Bay Watershed Model)

Delivery Factor: 0.74 (Chesapeake Bay Watershed Model)

Risk Reserve factor: 10% (Potomac Guidance)

Uncertainty factor: 40% (Potomac Guidance)

Current Nitrogen Loading Rate: 30 lbs/ac/yr (from NutrientNet)

Cover Crop Nutrient Reduction Efficiency : 45% (as given by Chesapeake Bay Program)

Source B- Point Source

Delivery Factor: 0,74

Current Nitrogen Loading: 100,000 lb/yr

Permitted Loading: 50,000 lb/yr

Risk Reserve Factor: 10%

Calculation:

Source A

Step 1: Current nitrogen load =
 $1000 \text{ ac} \times 30 \text{ lb/ac/yr} = 30,000 \text{ lb/yr}$ (calculated by NutrientNet)

Step 2: BMP implementation reduction =
BMP efficiency x current nitrogen load
 $45\% (1000 (30\text{lbs/yr})) = 13,500 \text{ lbs/yr}$

Step 3: Calculated delivered nitrogen loading reduction =
BMP implementation reduction x EOS delivery factor x in-stream delivery factor
 $(13,500 \text{ lbs/yr} (0.74)(.21)) = 2,098 \text{ lbs/year}$

Step 4: Apply trading ratios
Delivered nitrogen load reduction – (Delivered nitrogen reduction x risk reserve factor) –
(delivered nitrogen reduction x uncertainty ratio)
 $2,098 - (2,098 * .1) - (2,098 * .4) = 1,049$

Number of credits = 1,049

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Source B

Assuming no additional nutrient control the difference between the actual loading and permitted loading = $100,000 - 50,000 = 50,000\text{lbs}$.

Application of Delivery Factor = $50,000\text{ lbs} \times 0.74 = 37,000\text{ lbs}$ (credits needed)

Point source B could work directly with the agricultural co-op or a third party aggregator on a trade agreement then register the trade on the Department's website.