DRAFT
MARYLAND
TRADING and OFFSET
POLICY and GUIDANCE
MANUAL
CHESAPEAKE BAY WATERSHED

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ACKNOWLEDGEMENTS

TBD

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SECTION I

Draft Maryland Trading and Offset Policy and Guidance Manual

Protecting and restoring the water resources of the Chesapeake Bay and the many tributaries within its watershed present a great challenge to Maryland's citizens and businesses, as well as State, county, and local governments. Nutrient trading offers an attractive alternative to more traditional approaches for improving water quality and can often achieve results faster and at a lower cost. Maryland's new trading program provides expanded opportunities for all point and nonpoint sources by giving them access to the water quality marketplace and flexibility in meeting and maintaining their load limits by acquiring credits and/or offsets generated from load reductions elsewhere.

The Maryland Nutrient Trading Policy Statement, released on October 23, 2015, detailed a roadmap for the development of a cross-sector, water quality-based trading program and manual that use innovation, economies of scale, and public-private partnerships to accelerate the restoration of the Bay and local rivers and streams. The new comprehensive Draft Water Quality Trading Manual builds on the significant work of the Maryland Departments of the Environment (MDE) and Agriculture (MDA) with input of the stakeholder groups and committees to develop both point and nonpoint source trading policies and guidelines for the generation and acquisition of water quality credits. This new phase of the trading program and the draft manual, once adopted, will provide the framework for local governments and State and federal agencies with Municipal Separate Storm Sewer Systems permits (commonly known as MS4 permits) to engage in trading. The 2016 Draft Trading Manual describes policies and provides guidance to ensure transparency and accountability of all water quality credit exchanges.

The terms credit generators and credit sellers, as well as credit users and credit buyers and credit purchase and acquisition, will be used interchangeably in the text below.

Background

History, Goals, and Strategies

The original 1983 Chesapeake Bay agreement called for the signatory Bay jurisdictions of the states of Maryland, Virginia, and Pennsylvania and the District of Columbia to work cooperatively with the U.S. Environmental Protection Agency (EPA) and the Chesapeake Bay Program (CBP) to address pollution entering the Bay. Over the years, the first Chesapeake Bay Agreement was renewed and amended periodically, each time building off the last revision: adding numeric reduction goals in 1987; calling attention to not only the Bay itself, but also its tributaries in 1992; and in 2000, focusing on accelerating implementation by 2010 and capping/maintaining the loads. On December 31, 2010, the EPA set Total Maximum Daily Loads (TMDLs) for nutrients and sediment entering the Chesapeake Bay. In addition to setting these TMDLs, EPA required the Bay

watershed jurisdictions to develop statewide Watershed Implementation Plans (WIPs) to explain how and when they planned to meet their assigned allocations by 2025. In June 2014, a new Chesapeake Bay Watershed Agreement was signed, adding both climate change and toxic contamination to the list of challenges whose solutions will ultimately increase the resiliency of the Bay and its tributaries.

In response to the Bay TMDL, Maryland developed 2010 Phase I and 2012 Phase II WIPs. Every two years the State also develops and implements milestones that, together with the WIPs, detail Maryland's strategies for meeting its two-year goals and allocations by 2025. The EPA, however, continues to have oversight responsibilities for the progress of Bay state jurisdictions toward the ultimate goal of restoring the Bay and its tidal waters by 2025, and the agency could further tighten regulatory enforcement in the future.

The Role of Trading

The EPA supports trading and has indicated that market-based approaches such as water quality trading provide greater flexibility in achieving water quality and environmental benefits, result in early reductions and progress toward water quality standards, and can reduce the cost of implementing TMDLs for impaired waters. In 2001, the CBP and its Bay partners established a policy framework for trading with the publication of "Chesapeake Bay Program Nutrient Trading Fundamental Principles and Guidelines." In 2003, EPA issued its own Water Quality Trading Policy detailing national guidelines and delineating the purpose and potential benefits of trading, along with common elements deemed essential to the development of credible, sustainable trading programs. These two documents provided the basis for the development of initial trading programs in Maryland.

In January 2008, MDE finalized a document entitled "Maryland Policy for Nutrient Cap Management and Trading in Maryland's Chesapeake Bay Watershed" (2008 Cap Management Policy). Among the stakeholders who participated in the development of this policy under the leadership of MDE were the Maryland Association of Municipal Wastewater Agencies (MAMWA); the Waterkeepers Alliance; the Maryland State Builders Association and the National Association of Homebuilders; the Chesapeake Bay Foundation; representatives from the Maryland's Tributary teams; and MDA as well as the Maryland Departments of Natural Resources (DNR) and Planning (MDP).

During the development of point source policies (Phase I), it was recognized that trading between point and nonpoint sources presented some unique issues. Therefore, a second stage was initiated with the MDA taking the lead in the development of Phase II Policy and Guidelines, which focused on policies and procedures for generating credits in the agricultural sector and exchanging those credits. To assist in this effort, the Maryland Agricultural Nonpoint Trading Advisory Committee was convened with representation from a cross-section of public, not-for-profit, and business interests. The Committee provided guidance during the formulation of policy and procedures and the development of the infrastructure to support trading in Maryland.

Taken together, Phase I and II policies and guidance provide the framework for trading by defining the requirements and obligations of credit users and generators, buyers and sellers, and intermediaries (aggregators and brokers). The policies defined eligibility rules for point and nonpoint sources, baselines, geographies, mechanisms of exchange, rules for verification and assurance, and the process for the enforcement of trades. Trading policies require all pollution reduction trades to comply with local TMDL-based allocations and do not allow trading to cause or contribute to violations of local water quality standards. To ensure that trades result in a net decrease in loads, a retirement ratio is applied to trades at the time of sale and the credits so derived will be applied toward TMDL goals.

Maryland's Trading program has been developed to ensure reliable and transparent credit generation, certification, verification, and compliance. To facilitate trading with agricultural land owners and farmers, MDA developed and uses the Maryland Nutrient Tracking Tool (MNTT), which is a state-specific version of the web-based trading platform, the Chesapeake Bay Nutrient Trading/Tracking Tool (CBNTT). The CBNTT was built on the World Resources Institute's NutrientNet suite of tools, and incorporates both the Chesapeake Bay Watershed Model and county-specific agronomic data from the national Nutrient Tracking Tool developed by the U.S. Department of Agriculture (USDA)/Natural Resources Conservation Service (NRCS). In addition to the assessment tool, the online suite of components include: a registry to catalogue certified credits and completed trades; a marketplace to enable participants to post, track, and trade credits and manage individual accounts; an administrative module to assist in the supervision of the overall program and the generation of relevant reports; and an interactive mapping feature to delineate field boundaries and retrieve and forward allied information.

EPA's expectations for offset programs are articulated in Section 10 and Appendix S of the Chesapeake Bay TMDL. EPA conducted assessments of the Bay jurisdictions' trading and offset program and found the Maryland Trading Program to be consistent with the Clean Water Act (CWA) and the Chesapeake Bay TMDL. In 2013, EPA began the process of developing Technical Memoranda (TMs) as guidance for the Bay Jurisdiction to consider when developing or updating various aspects of trading programs.

This document builds on Phases I and II of the 2008 Cap Management Policy, as well as on EPA policies and guidance. It provides options for the regulated community in accelerating water quality restoration and meeting loading limits, Bay restoration requirements under the Maryland WIPs, and 2-year milestones while maintaining consistency with requirements of the CWA. It also provides options for offsetting impacts from new or increased loads of wastewater facilities. It supports teamwork, public-private partnerships and innovations.

Interstate water quality trading can be another opportunity for a cost-effective solution to the Bay restoration, but only if reciprocity among programs is established and protection of the local water quality is ensured.

1. Maryland Water Quality Nutrient Policy Statement

Introduction

The Chesapeake Bay is the nation's largest estuary and one of the most complex ecosystems in the world. The Bay's vast watershed stretches across some 64,000 square miles and encompasses parts of six states and the entire District of Columbia. The cumulative impact of human activities throughout the watershed has caused increasing pollution from an overabundance of nutrients, primarily nitrogen and phosphorus, resulting in serious degradation of the waters of the Bay and the many rivers, streams, and creeks that flow into it.

Nutrient and sediment loads come from a variety of sources, including agriculture, wastewater treatment plants, septic systems, urban stormwater run-off, and atmospheric deposition. Despite extensive restoration efforts by the Bay states, the lack of significant progress prompted the EPA to establish the Chesapeake Bay TMDL, setting annual limits for nutrient and sediment loads and providing accountability through state WIPs detailing targeted reductions from all sectors.

Achieving these reductions and maintaining the loading caps while accommodating continuing economic and population growth will be challenging. Total cost estimates for adopting best management practices and/or installing controls to reduce nutrient and sediment discharges vary widely from sector to sector. Since the costs of meeting the TMDL will be borne by all segments of society and all levels of government, it is imperative to identify and implement strategies to lower those costs.

Nutrient trading has emerged as a promising strategy for introducing cost-effectiveness and market-driven efficiency to the realization of nutrient reductions. Under this approach, sectors are given the flexibility to meet and maintain their load limits by acquiring credits and/or offsets generated from load reductions elsewhere. The likelihood that this option will be selected increases if the credit purchase is less expensive than other alternatives and the purchased reduction is deemed credible and verifiable.

Accordingly, attention has shifted to the agricultural community and other sources where compliance may be accomplished and exceeded at a much lower cost per pound than pollution reduction on site. MDE and MDA have been working collaboratively to establish a voluntary, market-based program to promote the use of trading as a viable option for achieving the State's load reduction goals. This program envisions trading not only within and between sectors ("cross-sector trading"), but ultimately between Maryland and the other Bay states ("interstate trading").

Guiding Principles

The State of Maryland is committed to a new trading program that:

- Accelerates the restoration of the Chesapeake Bay while reducing the cost of implementation
- Maintains consistency with the federal Clean Water Act, the Chesapeake Bay TMDL, Maryland law and regulation, and any other applicable requirements.
- Offers competitive alternatives for accomplishing both regulatory and environmental goals
- Protects local water quality
- Uses the best available science and appropriate metrics to estimate and/or measure pollution reductions, manage risk, and ensure the validity of credits
- Provides accountability, transparency, and accessibility for all interested parties
- Includes necessary compliance and enforcement provisions
- Creates incentives for investment, innovation, and job creation
- Fosters collaborative partnerships between public and private entities and among diverse stakeholders, and
- Positions Maryland to participate in interstate trading activities

Cross-Sector Trading

Maryland recognizes that the primary drivers for trading are the regulatory programs that require pollutant reductions. MDE opened the door to trading and the generation and use of nutrient credits and offsets in the point source sector by the wastewater treatment plants (WWTPs) under the auspices of the Cap Management Policy adopted in 2008. Given the advances made by MDA in developing a web-based suite of tools to support trading, it is time for the State to implement policies that will broaden the availability of trading among sectors.

A number of studies have shown that there is a potential for substantial cost savings when the scope and scale of trading expands and regulated stormwater sources participate in trading. Under Maryland's cross-sector trading program, trades may occur between point sources, including for the first time, the MS4 community (hereafter referred to as regulated MS4 jurisdictions), and between point sources and nonpoint sources, such as between MS4s (considered point sources as they are subject to the National Pollutant Discharge Elimination System (NPDES) permits) and agricultural operations. The regulated MS4 jurisdictions are now allowed to enter into cross-sector trading to meet a portion of their impervious surface restoration and Bay TMDL nutrient and sediment reduction requirements through the purchase of credits.

The trading framework for Maryland will facilitate trading by point and nonpoint sources for total nitrogen (TN), total phosphorus (TP), and total suspended solids (TSS). Cross-sector trading will be permitted in Maryland within three geographic areas: (1) the Potomac River Basin; (2) the

Patuxent River Basin; and (3) the combination of the remainder of the Western Shore, the Eastern Shore, and the Susquehanna River Basin. Interstate trading will be developed incrementally to build capacity within Maryland and ensure reciprocity between trading programs of the Bay jurisdictions.

In addition to the above, there may be some benefits in common with carbon trading and practices that reduce greenhouse emissions. Since many of the agronomic, land use, and structural practices also store carbon and lower other greenhouse gas (GHG) emissions, the existing nutrient marketplace could provide a platform for the addition of a voluntary carbon component once it is fully developed and the nutrient marketplace is fully functioning.

Private Sector Role

The development of a public marketplace for trading provides new employment opportunities for individuals and organizations offering services to support an emerging environmental restoration economy. Beyond the benefits of retaining and creating agricultural jobs and generating supplemental farm income, the assessment and verification of credits, the need for annual inspections, the design and installation of structures and systems, and the acquisition, management, and re-sale of credits are expected to be sources of revenue for consultants, technical advisors, engineers, contractors, aggregators, environmental bankers, and brokers.

2. Key Provisions

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

2.1 What May be Traded

MDE supports trading and through this policy seeks to specifically facilitate the trading of nutrients (TN, TP) and sediment (TSS) credits. Such trades should involve comparable credits (e.g. nitrogen traded for nitrogen). MDE may in the future consider authorizing cross-pollutant (nitrogen for phosphorus or vice-versa) trades but only in strict accordance with any new Chesapeake Bay Program recommendations and equivalency factors for these parameters and a public process to evaluate the recommendations for incorporation into trading policy.

2.2 Unit of Trade

The unit of trade, the pollution reduction credit, is expressed as mass per unit time (e.g. pounds per year or in the case of sediment tons per year).

2.3 Duration of Credits

Credits will be valid for one year (January through December) and may be applied (used) only in the year the credits are generated in the context of the Chesapeake Bay watershed. This means that credits need to be measured, verified, and accounted for according to that time period. The lifespan of credit certifications should be consistent with the time periods that are used to determine compliance with NPDES permit limitations or other applicable requirements. Because practices will be installed at different times during the year, the total estimated annual credits generated from any practice installed within a given year will be considered to be generated the following year starting January 1. For example, installing a wetland in June of 2016 means that the annual credit will be given to that project beginning with calendar year 2017. Credits cannot be banked for future years. For example, if a best management practice (BMP) generates 100 credits each year and has been certified for five years, 500 credits cannot be applied to a permit in year five.

2.4 Who May Participate in Trading

- Point sources
  - WWTPs (Significant, Minor, Municipal, Industrial)
  - MS4 Juridictions
  - Industrial Stormwater Sources
- Nonpoint Sources
- State of Maryland
- Federal Agencies
- Any Person or Entity Engaged in Nutrient and/or Sediment Removal from the Environment
- Aggregators and Brokers
- Third Parties
- Any Combination of the Above

Subject to applicable laws, any person or entity may create, purchase, retire, or otherwise acquire and use credits for the purpose of securing long-term improvements in water quality. The State has the authority to deny any proposed trade, including any trade for the purpose of retiring credits, if the State determines such trade to be in conflict with or likely to impede other State policies.

2.5 Where Trading May Occur (Trading Regions)

Geographical boundaries for trading will be based on three large watersheds or "trading regions."

- Potomac Tributary Basin
- Patuxent Tributary Basin
- Eastern Shore and Western Shore Tributary Basins, including the Susquehanna watershed

In order to ensure equivalent water quality results, delivery factors will be applied to account for

possible differences in delivered loads between the trading partners due to location.

2.5.1 Trading Priority Order for the Regulated MS4 Jurisdictions

Regulated MS4 jurisdictions will be required to implement trading with point or nonpoint sources in the following priority order:

1) Within a local watershed under a TMDL
2) Within the regulated MS4 jurisdiction's boundary
3) Within any eight-digit watershed that extends beyond the MS4 jurisdiction's boundary
4) Within Maryland Trading Regions (only after the three priorities above have been exhausted)

2.6 Regulatory and Environmental Goals

Regulated and non-regulated sources can use trading as an alternative solution/option to achieve their regulatory and environmental goals, and to comply with their TMDL allocations as long as the alternative conforms to this Trading Policy.

2.7 Consistency with TMDLs

All nutrient and sediment trades on behalf of Chesapeake Bay goals must be consistent with local TMDL-based allocations.

2.8 Local Water Quality Protection is Mandatory

Trades may not cause or contribute to local water quality impairments.

2.9 Net Improvements – Retirement Ratios

A portion of a trade will be retired and may be used for the purpose of securing long-term improvements in water quality. Retirement ratios may be adjusted over time.

2.10 Credit Calculation and Verification

Credits will be quantified using metrics consistent with appropriate assumptions and provisions of the Bay TMDL and the Chesapeake Bay Watershed Model (CBWM) and verified to ensure that they are producing expected reductions.

2.11 Accountability and Tracking

Credits will be accounted and tracked with maximum transparency and accessibility to all interested parties.

2.12 Enforcement and Compliance

Trades involving waste load allocations (WLAs) must include appropriate compliance and enforcement provisions to ensure that credits are real, accountable, reliable, and enforceable.

2.13 Coordinated Framework and Stakeholder Participation

The trading program implementation includes a coordinated framework and collaboration with State and federal agencies and the public and private sectors, as well as access to trading program information, credit generation opportunities, and other relevant information via State-sponsored and /or required websites, press releases, and public outreach efforts.

2.14 Interstate Trading

Maryland's Trading Program is positioned to take advantage of interstate trading. For interstate trading to fully succeed, barriers to the trading market entry must be minimized through general consistency between states' programs and a resolution of the differences in the baseline approaches, standards, and methodologies.

3. Purpose of Draft Maryland Trading Policy and Guidance Manual (Trading Manual)

This manual serves several important purposes with the combined intent of enabling and promoting trading in Maryland.

First, it updates and consolidates three existing trading policy and procedure documents:

- The Maryland Policy for Nutrient Cap Management and Trading in Maryland's Chesapeake Bay Watershed:
    - Phase I, Point Source Policy, developed by MDE in April 2008
    - Phase II A: Guidelines for the Generation of Agricultural Nonpoint Source Credits, developed by MDA in 2008
    - Phase II B: Draft Guidelines for the Exchange of Nonpoint Credits, Maryland's Trading Marketplace, developed by MDA in 2008

Second, this document going forward adds cross- sector trading policy that would provide more flexibility and additional options for the regulated MS4 jurisdictions in meeting a portion of each affected jurisdiction's impervious surface and Bay nutrient and sediment reduction requirements through the purchase of credits.

Third, this document establishes that non-MS4 jurisdictions and onsite sewage disposal systems

(OSDSs), a.k.a., septic system sector, may achieve their share of the Chesapeake Bay load reductions via the acquisition of credits.

And fourth, this document not only builds on the regulatory tools, but supports and cultivates public-private partnerships, teamwork, innovation, transparency, and accountability.

Effect of Policy

The policies and procedures outlined in this manual are intended to supplement existing requirements. Nothing in the policies or procedures reduces or replaces existing regulatory requirements.

The policies and procedures herein are not legislation or a regulation. This document outlines the framework for the generation and use of point and nonpoint source credits. It describes who is eligible to trade, where trading may occur, what may be traded, options for generating credits, and point source trade implementation by MDE via NPDES permits. Also included is MDA's administrative and regulatory discretion for the verification, certification, and registration of agricultural credits. The State will undertake program modifications and enhancements as deemed appropriate in the future. Neither the load allocations nor the credits generated or used under this policy are a property right.

Effective Date: April 17, 2008
Updated January 2016

Authority

Federal:
Federal Water Pollution Control Act, 33 U.S.C. § 1251 et seq. (commonly referred to as "Clean Water Act").
Clean Water Act's NPDES using EPA's implementing regulations as delegated from EPA to MDE.
U.S. EPA's Final Water Quality Trading Policy, January 13, 2003.
U.S. EPA's Permit Writers Toolkit for Trading, August 2007.
Chesapeake Bay Program Nutrient Trading Fundamental Principles and Guidance (U.S. EPA, 2001).
Maryland:
MDE, Maryland Policy for Nutrient Cap Management and Trading in Maryland's Chesapeake Bay Watershed, 2008.
MDA, Maryland Policy for Nutrient Cap Management and Trading in Maryland's Chesapeake Bay Watershed Phase II-A: Guidelines for the Generation of Agricultural Nonpoint Nutrient Credits, 2008, 2010, 2012.
MDA, Voluntary Agricultural Nutrient Credit Certification Program. ch. 447, §§8–901 through 8–904, Annotated Code of Maryland, Agriculture, 2010.
MDA, Voluntary Agricultural Nutrient and Sediment Credit Certification Program, Agriculture

Article, §§2-103(b), 8-902, and 8-903, Annotated Code of Maryland, 2012.
MDA, Maryland Agriculture Certainty Program, §§8-1001 *et seq*., Annotated Code of Maryland, 2015.

SECTION II

Point Source (WWTPs) Cap Management and Trading

Background

To achieve Maryland's water quality standards for the Chesapeake Bay Maryland developed WIPs which include strategies for each sector: point, urban, agricultural, and septics. The main aspects of the WIP's Point Source Strategy are: (1) continue to upgrade all significant and some minor WWTPs to state of the art Enhanced Nutrient Removal (ENR), and (2) maintain the nutrient load caps for all point sources. New and expanding loads had to be offset. MDE's 2008 Cap Management Policy, entitled "Maryland Policy for Nutrient Cap Management and Trading in Maryland's Chesapeake Bay Watershed", provided the framework for managing point source nutrient caps and offsetting new nutrient loads via trading with point and nonpoint sources.

In other states in the Chesapeake Bay watershed, nutrient trading has played a role in either reducing nutrient loads from point sources to meet Bay TMDL WLAs or to maintain them. In Maryland, 100 percent grant funding was made available by the Bay Restoration Fund (BRF) Act for ENR upgrades of significant and publicly owned WWTPs, and therefore, trading was not allowed as a substitute for the upgrades of significant facilities.

New or expanding wastewater treatment facilities with no allocation in the Bay TMDL are required to offset increased loadings. In Maryland, point source trading is primarily used to *maintain* point source WLAs, i.e., to offset increases in WWTPs loads associated with growth. MDE has issued a number of NPDES permits utilizing offset options outlined in the 2008 Cap Management Policy.

The Trading Manual outlines the main elements of the 2008 Cap Management Policy for point sources, including the list of trading options and implementation and enforcement of point source trades via NPDES permits. However, there are other sources that are considered point sources. Among them are the NPDES regulated stormwater discharges from three potential sources: MS4s, construction activities, and industrial activities. To distinguish between these two point sources, this manual will continue to refer to the NPDES-permitted discharges from sewage treatment plants or industrial facilities as *point source*, and to regulated public stormwater dischargers as MS4 jurisdictions. Regulated MS4 jurisdiction trading guidelines are described in Section III of the Trading Manual.

1. Key Principles

In addition to the Guiding Principles and Key Provisions, which are delineated in Section I, and apply to all trading parties, the following Key Principles apply to point source trading:

1.1 Point Source Trade Implementation and Enforcement via NPDES Permits

A point source does not become eligible for trading until baselines (WLAs) are adopted in its discharge permit. Permit limits based on 2010 Bay and/or local TMDL WLAs serve as the baselines for generating credits for use in trading. The use of the discharge permit program ensures that the process is transparent and all credits are accountable, reliable, and enforceable. Permits provide the vehicle for enforcement of trade conditions.

1.2 Consistency with the County Water and Sewerage Plan

All point source trades must be consistent with the approved County Water and Sewerage Plan. Dischargers trading away credits must evaluate potential impacts on current and projected sewer capacity allocations using methodology consistent with MDE's Wastewater Capacity Management Plan Guidance.

1.3 All New and Expanded Point Source Nutrient Loads Must be Offset

New point source dischargers with no allocation in the 2010 Bay TMDL or point source dischargers requesting an increase in WLA must offset any increased point source loading. These nutrient loads can be offset via trading.

1.4 Duration of Credits

Because one purpose of trading is to accommodate new or expanded dischargers that have no WLA, credits acquired for use as discharge offsets must be certain and reliable for an extended time period. A new or expanding point source discharger submitting a trading proposal must demonstrate that it has secured credits for as long a period as is feasible. At a minimum, point sources must have secured the contractual right to credits for two (2) full five year permit terms. In addition, the facility must submit a plan showing how it intends to acquire the necessary credits for at least 10 years beyond the two permit terms for a total planning horizon of 20 years. At each subsequent NPDES permit renewal, the facility must demonstrate the securing of credits for the coming ten-year permit period, and update its plan for acquiring them over the subsequent 10-year horizon.

Industrial facilities must secure credits sufficient to cover a period of at least 10 years (2 permit cycles), to be updated with each permit renewal.

Other safeguards, as determined by MDE, may be required. This may include such things as backup plans and alternative options to address failures by nonpoint sources to provide the contracted credits.

1.5 Public Outreach/Stakeholder Participation

The implementation and enforcement of NPDES permits will provide stakeholders and the public with an opportunity to comment on and access information related to point source trading. MDE will indicate in the public notice when any conditions allowing trading have been included in the draft permit. These conditions, along with other conditions of the permit, will be subject to the normal comment process and period (usually 30 days).

1.6 Point Source Baseline Funding

State and federal grant funds can be used to upgrade point sources to meet their WLAs, which also serve as trading baselines.

1.7 Cost of Credits

The cost of credits or exchange arrangements/conditions of trade will be determined by the market.

1.8 Compliance with local TMDLs and Water Quality Standards

All trades must be consistent with any local TMDL-based allocations, and must not cause or contribute to any local water quality impairment or violate water quality standards. Point source trades are implemented through permits and through associated enforcement actions which contain conditions to achieve the assumptions of the WLAs.

1.9 Retirement Ratio

MDE will require a 5 percent retirement ratio applied to each point-source generated credit. This ratio may be adjusted over time. Retired credits may be used for the purpose of securing long-term improvements in water quality. Other related purposes deemed appropriate by MDE may be considered, subject to applicable laws and input from a public participation process.

1.10 Flow Management

A municipal wastewater authority may request to redirect flows among its facilities, together with their associated ENR based allocations, as part of an NPDES permit renewal or modification application. Such flow management is not considered trading when it involves a single owner and all facilities involved are facilities to be upgraded to ENR. Moreover, such flow management does not provide any relief from requirements for upgrading to ENR treatment and for consistency with the Water and Sewerage Plan and Capacity Management Plan.

2. Eligibility

A point source does not become eligible for trading until baselines are adopted in its discharge permit. Facilities with the State groundwater permits may also participate in trading once their baselines are adopted in the State permit.

Municipal permittees trading away credits based on a determination that they have excess capacity must demonstrate that the trade is consistent with the applicable Water and Sewerage Plan and evaluate the impact on current and projected sewer allocations using methodology consistent with MDE's Wastewater Capacity Management Plan Guidance.

3. Trading Baselines

Maryland Phase I WIP, Appendix C, "NPDES Dischargers in the Maryland Bay Watershed", provides a comprehensive list of significant and non-significant municipal and industrial wastewater facilities within the State's Bay watershed area, along with locations and available permit information on these point sources. The individual or aggregate point source target loads for these facilities are included in Appendix B1, "Detailed Targets and Reduction Schedule."

Baselines for point sources that want to trade are based on 2010 Bay TMLD WLAs for significant facilities and are determined individually for minor facilities. Permittees that are regulated based on a local watershed TMDL will have two separate baselines whose applicability depends on the geographical area of a trading partner. To participate in trading, permittees must first achieve the applicable baseline before they can generate credits.

The State reserves its authority to adjust any new allocations if it is determined that there is a conflict with the implementation of State policies.

3.1 Significant Point Sources

Significant municipal WWTPs in Maryland are those with a design capacity of 500,000 gallons per day (gpd) or greater. Annual WLAs for significant facilities are based on design capacity consistent with the approved local water and sewer plan as of April 30, 2003 and an annual average concentration of 4.0 mg/l TN and 0.3 mg/l TP, a.k.a, ENR treatment. Facilities may have tighter WLAs, baselines, based on local water quality requirements.

3.2 Minor Point Sources

Existing minor municipal WWTPs in Maryland are those with a design capacity of less than 500,000 gpd. The annual nutrient load goals for minors were established in 2004 Point Source Tributary Strategy, which was part of the Maryland's Chesapeake Bay Tributary Strategies Statewide Implementation Plan. These goals were based on the design capacity in 2000 or the

projected flow for year 2020, whichever was less, and a concentration of 18 mg/l TN and 3 mg/l TP. These goals were aggregated into WLA for minors in the Bay TMDL.

Minor dischargers that want an option to generate credits for trading through nutrient removal process upgrade at their own expenses will be assigned an annual WLA as effluent limits in their wastewater discharge permits based on the nutrient loading goals specified in the 2004 Tributary Strategy. This WLA will serve as a trading baseline.

Minor dischargers that want an option to generate credits for trading through nutrient removal process upgrade sponsored by BRF will be assigned an "adjusted" annual WLA in the wastewater discharge permits based on the design capacity consistent with the approved local water and sewer plan when the funding agreement was finalized and a concentration of 4 mg/l TN and 0.3 mg/l TP based on the standard ENR performance.

In either case, the WLA, baseline, assigned to minor point sources after the ENR upgrade process should not exceed either (1) the previously assigned 2004 Point Source Tributary Strategy loading goals for the facility, or (2) 6,100 lbs/yr TN load cap and 457 lbs/yr TP load cap, whichever is less. Loads in excess of 6,100 lbs/yr of TN and 457 lbs/yr of TP will revert back to the State and be reallocated by MDE on case by case basis.

For existing minors not participating in the trading program, 2004 Point Source Strategy loading goals will be assigned as permit goals instead of limits unless the permit involves an increase in design capacity to ≥0.10 mgd.

3.3 Significant Industrial Point Sources

WLAs for significant industrial point sources identified in the Maryland WIP for the Bay TMDL, are based on a combination of (1) historical performance levels; (2) the amount of loading reductions already achieved since the initial baselines established in 1985; and (3) establishment on a case by case basis of additional potential loading reductions. Industrial facilities with a minimum TN discharge of 75 pounds per day or minimum TP of 10 pounds per day had their annual load goals included as WLAs in their discharge permits.

4. Options for Generating and Acquiring Credits

Credits may be generated and/or acquired through any of the options listed below, as well as other options that may be proposed on a case-by-case basis through the NPDES public participation process:

- Upgrading an existing minor WWTP to BNR or ENR
- Retiring an existing minor WWTP after connecting to BNR or ENR facility
- Upgrading Industrial Point Sources
- Retiring an existing (as of April 2008) OSDS by connecting to an ENR facility

- Land application of wastewater with pre-treatment and nutrient management controls
- Implementing nonpoint source practices (agricultural credits, wetland restoration, other options)
- MS4 Jurisdiction credits

Other point source credit generation options include:

- Optimizing treatment operation
- Maintaining flow at less than the design flow basis of its nutrient WLA

4.1 Upgrading an existing minor WWTP to BNR or ENR

4.1.1 Minor WWTP upgrades without utilizing State grants

All existing minor WWTPs may generate credits for trading by upgrading to BNR or ENR without utilizing State grants. When a credit buyer, a new facility, or an expanding facility obtains consent of the minor facility to upgrade the existing facility to BNR or ENR, MDE will allocate the appropriate loading to that buyer/discharger as follows. The participating minor facility will be given a permit limit effective upon completion of the upgrade corresponding to WLAs not to exceed 6,100 TN load cap and 457 lbs/yr TP load cap, as discussed above. As a result, MDE will then allocate to the new discharger via a permit up to 95 percent of the difference between the previous allocation and the new reduced allocation of the upgraded minor. The remaining load will be retired for net water quality benefit. In addition, the minor facility may also choose to trade some of its resulting permit WLA consistent with this policy. [Note: A minor WWTP is not considered to have a specific nutrient load allocation for trading except where it has been included in a discharge permit as a limitation.]

4.1.2 Minor WWTP Upgrades with State grants

Minor facility upgraded to ENR using State grants may trade some of its permitted WLA.

4.2 Retiring an existing minor WWTP after connecting to BNR or ENR facility

MDE will allocate to the permittee, subject to ensuring the protection of local water quality, the same loading as though the existing minor sewage treatment plant had been upgraded to BNR/ENR prior to being taken off-line.

4.3 Industrial Point Sources

Technology-based upgrade requirements may be applied on a case-by-case basis or other appropriate approaches that generate credits through reductions in discharges, including, but not limited to, implementation of pollution prevention and recycling.

4.4 Retiring an existing (as of April 2008) OSDS by connecting to an ENR facility.

MDE may provide a nitrogen loading allocation to an ENR facility (or a facility with plans to upgrade to ENR) based upon 50 percent of the original OSDS load and proximity of the retired residential OSDS to surface waters. For an ENR plant producing effluent nitrogen of 4 mg/l, the transfer of flow from a residential OSDS to the treatment plant would generate the following credits:

A. In critical areas – 9.28 lbs/yr TN
B. Within 1,000 feet of any perennial surface water – 5.8 lbs/yr TN
C. All other – 3.48 lbs/yr TN

These credits are based on 5.3.2 model assumptions used by the CBP for nitrogen and phosphorus. MDE assumes an 80 percent delivery rate in critical areas; a 50 percent delivery rate within 1,000 feet from any perennial surface water; and a 30 percent delivery rate from distances greater than 1,000 feet from any perennial surface water (i.e., all other systems).

With regard to phosphorus, the CPB assumes the average residential septic system delivers *no TP*. Therefore, the allocation approval would require demonstration that the proposed significant ENR facility will meet its existing permit requirements for phosphorus after accounting for projected increased phosphorus loading of 0.23 lbs of TP per house connected.

MDE intends to hold minor facilities with BRF funded WLAs harmless from loadings from septic connections. If available, the State would use the surplus TP WLA coming from the minor upgrade to provide adjusted phosphorus WLA for a septic connection as long as no local hot spot is created by this arrangement. A phosphorus credit of 0.23 lbs per year per equivalent dwelling unit (EDU) will be the basis of the plant load allocation for septic connections to an upgraded facility. This credit will allow minor facilities to connect septics without the need to achieve lower than 0.3 mg/l TP concentration.

Credits for connecting non-residential systems will be established on a case-by-case basis. Credits may also be considered on a case-by-case basis when OSDSs are connected to a decentralized system that is highly efficient at removing nitrogen.

4.5 Groundwater Discharges

Facilities with state groundwater permits may request a permit loading cap for nitrogen and may participate in trading with other point sources. Land application of wastewater with appropriate pre-treatment and nutrient management controls may be used to offset new or expanding nutrient loads. An appropriate groundwater permit from the State of Maryland will be required. The permit will consider the yearly nitrogen balance calculations, the hydraulic loading rate, and the crop to be planted on the spray/drip fields, storage during the winter months, and other best management practices (BMPs) in order to achieve targeted nitrogen concentration in the groundwater percolate

and protect public health and the environment. Before MDE can process a municipal groundwater discharge permit, proposed municipal projects must be included in the County Water and Sewer Plan.

4.6 Optimizing treatment operation in Significant and Minor ENR facilities

MDE will implement trades involving optimized treatment operations through a permit modification[1] of the ENR facility's limits to reflect corresponding changes. The available credits shall be based on the existing permitted limits and WLAs for the facility (significant or minor) minus the nutrient loading calculated based on the projected achievable treatment performance level. The projected level shall not assume improved performance beyond demonstrated historical performance levels unless data from similar representative facility is available and relevant. In addition to the above, available credits shall account for the load allocations approved and reserved for new development. The reductions in nutrient allocations will then be reflected in the discharge permit as a revised nutrient loading limitations.

4.7 Maintaining flow at less than the design flow.

Eligible ENR facilities can generate credits by maintaining flow at less than the design flow basis of the assigned nutrient WLA. MDE will implement such trades through a permit modification of the ENR facility's limit to reflect the corresponding reduction in its allocation. The available credits shall be based on the WLA, the baseline loading allocation for the facility, minus the nutrient loading calculated at the remaining flow capacity of the treatment system and the projected achievable treatment performance level. The projected level shall not assume improved performance beyond demonstrated historical performance levels unless data from similar representative facility is available and relevant. All credit exchanges must be consistent with the approved local Water and Sewerage Plan and, as appropriate, an evaluation of wastewater capacity consistent with the methodology provided in MDE's Wastewater Capacity Management Guidance.

4.8 Other Innovative BMPs

This manual does not preclude other practices, once approved by the CBP, from being used to generate credits. Established technologies such as septic system upgrades, wetlands restoration or creation and others may potentially generate credits. Similarly, the development of innovative and

[1] This should be a minor permit modification, which does not require a public participation process. Any permit limit revised to be more stringent based on the request of the permittee is not considered a major modification under this trading policy because the less stringent requirement already went through public participation. The new or expanded facility's permit issuance would include standard public participation requirements.

emerging technologies such as water reuse, oyster aquaculture, and algal farming is encouraged since they may become eligible for credit generation in the future.

MDE is also receptive to exploring an option for facilities to obtain credits through payments into new or existing State-managed funds. However, even that option shall require that an equivalent annual nutrient loading credit be implemented within the first year of discharge in order to qualify as an available offset for the new or expanding facility.

Finally, MDE is interested in third-party initiatives, public-private partnerships, and aggregators and water quality banks to create and provide credits for new or expanding point sources.

4.9 Trading with Agricultural Nonpoint Sources

Maryland recognizes the need and the advantages of using nonpoint source reductions to offset point source increases. Section IV of this Trading Manual provides specific details on trading with agricultural landowners and farmers. It describes the web-based suite of tools that helps farmers and landowners not only to determine baseline compliance and assess credit generating capacity, but also allows participants to post and exchange information on credit availability, credits desired, quantity, and price.

4.10 MS4 Jurisdiction Credits

Section III of this Trading Manual provides specific details on trading with MS4 jurisdictions.

5. Incorporating Trades in NPDES Permits

5.1 Individual Permits

Point source trades will be implemented and enforced through discharge permits. The trade itself or the process by which the trade is calculated must be specified within the permit, or the permit will have to be reopened to implement the trade.

5.2 Bubble or "Overlay" Permits

A Bubble or Overlay permit is an alternative group permitting approach available to owners of multiple facilities for implementing the nutrient caps. Instead of multiple caps, one for each facility in a watershed, the central owner may elect to receive a single permit with one nutrient loading cap for all of the facilities it operates in the watershed. Technology-based treatment requirements for nutrients at each of the individual facilities will be included either in the bubble permit or in the

permits required for each individual facility.[1] Any local TMDL-based limits applicable to facilities in sub-watersheds would continue to apply to the individual facilities in addition to the overall loading cap. Additionally, the bubble permit does not preclude any individual non-nutrient permit limits. All discharge flows must continue to be consistent with the local Water and Sewerage Plan as well as the permitted design flows for the individual facilities.

A single combined bubble permit may be issued to multiple owners in a watershed electing to form an association and obtain a single permit as co-permittees. Under any bubble permit approach, individual discharge permits issued to each individual facility would continue to specify monitoring and reporting requirements for nutrients as well as the requirements for other regulated pollutants.

6. Implementation

This section describes the requirements and the process for obtaining MDE's approval for permit modifications for nutrient trades

6.1 Identifying Trading Partners

Municipal or industrial facilities seeking to acquire or sell discharge credits are responsible for identifying trading partners. The pool of candidates consists of Maryland's WWTPs eligible trading partners identified in the Key Provisions of the Trading Policy. In addition, trading partners can be identified by contacting MDE, individual WWTPs, MDA, or third-party stakeholder groups such as MAMWA.

6.2 Application Process and Documentation Requirements

Point sources planning to utilize credits obtained from another point source or nonpoint source shall submit joint application(s) for modification of the NPDES permit(s) of trading partners to MDE. The application shall be composed of three parts: (1) specific details of the trade; (2) credit buyer documentation; and (3) credit seller documentation. The application and any standardized forms, along with information about the process for applications and documentation of trades may be obtained from MDE.

6.3 The Trading Application – Specific Details of the Trade

The trading application shall provide specific information about the proposed trading arrangement.

[1] The purpose of the overlay (or "bubble") permit is to allow a facility with excess capacity to share its capacity with another facility without a formal trade or permit revision; however, sharing unused capacity should not be a mechanism for allowing excess loadings to be discharged in any given year as a result of failure to optimize treatment levels.

This information shall include the following:

- The owner of the credits
- The credits user and/or purchaser
- The trading area and basin
- The credit contract/agreement period (Duration of the contract)
- The source of the credits
- The number and type of discharge credits to be exchanged each year during this period
- The length of credit life (annual, seasonal, or permanent)
- The methodology for determining the number of required credits to be exchanged, and
- The general contractual arrangements

This policy does not necessarily require the disclosure of all contract terms, and the trading parties may keep some contract terms confidential. Section IV of the Trading Manual provides guidance on the acquisition/purchase of agricultural credits, buyer eligibility, trading mechanism, contracts, and other requirements. MDE will work with stakeholders to determine the minimum requirements for disclosure of contract terms that would allow for adequate review of the trade proposal.

6.4 Point Source Credit User Documentation

The facility acquiring credits shall provide information on the following matters:

- The need for the trade, including WLA status, flow, and load projections
- The consistency of the trade with the following: the approved County Water and Sewerage Plan, planned service areas, priority funding areas, TMDLs, and once adopted, Water Resources Element of the Land Use Plan
- The location of the facility, including a facility location map, the eight-digit River Basin designation of the discharge point, and the Chesapeake Bay Program watershed model delivery factor
- The credit acquisition plan. A new or expanding facility must document contractual arrangements that secure an adequate number of credits for 10 years (i.e. two NPDES permit terms). In addition, it must provide a plan showing how it intends to acquire sufficient credits for the subsequent 10 years beyond the 10-year contractual period.
- Credit Generator/Supplier Information

6.5 Point Source Credit Generator/Supplier Documentation

The facility providing discharge credits shall provide the following information/documentation:

- How the discharge credits will be generated by the facility
- The consistency of the trade with the facility's growth and infrastructure planning, including the approved County Water and Sewerage Plan

- Evaluation of the impact of the trade on current and projected sewer allocation, using methodology consistent with MDE's Wastewater Capacity Management Plan Guidance
- The location of the facility, including a facility location map, the eight-digit River Basin designation of the discharge point, and the Chesapeake Bay Program watershed model delivery factor
- The credit life
- The contract terms
- The credit user information

MDE will review and evaluate permit application(s) to trade based on the requirements described in this manual. MDE may request additional information to evaluate trading proposals from MS4 jurisdictions and/or other trading partners. Unless additional information is requested, the application will be accepted, accepted with conditions, or denied. MDE approval is not final until the NPDES permits are modified as necessary to incorporate the trade.

7. Institutional Framework and Structure

MDE will be responsible for oversight and management of this trading program, including responsibility for policy decisions on issues such as eligibility, credit certification, verification, compliance monitoring, and enforcement. MDE may elect to contract some activities to third parties, such as credit verification or third party audits of transactions. Specific details of agricultural nonpoint source credit certification, verification, and registration are being codified in the proposed new Regulations, COMAR 15.20.12, Agricultural Nutrient and Sediment Credit Certification Program, and are addressed in Section IV.

Implementing this policy and procedures outlined in the Trading Manual, requires staff resources. It is MDE's intention to work with other State agencies to get a trading program established using available resources. As the program evolves, a fee-based approach may be adopted.

8. Stakeholder Involvement and Public Process

Maryland has been and will continue to work with a broad set of stakeholders in the development and implementation of this Trading Policy. Continuing program development will provide opportunities for both the public and stakeholders to provide input and comment on the development and implementation of the trading program. Program elements, such as the registry, will provide timely information about credit generation and use, credit certification and verifications, and results of credit inspections and water quality monitoring.

MDE and MDA believe that a clear and transparent process and presentation of results is key to establishing and maintaining credibility for the trading program. The use of NPDES permits by MDE ensures transparency and tracking of point source credits. An opportunity for public notice and comment is included in the NPDES permit process. If an NPDES permit specifically or

conditionally authorizes trading and the public has had an opportunity to comment on the proposed trading conditions during the draft permit public process, then no additional public outreach will be required and any subsequent trades meeting the conditions of the permit will be implemented without formally reopening the permit (i.e. implemented as a minor permit modification). Standard posting on the website will also be maintained.

MDA and MDE will continue working with EPA to support credit tracking for CBP modeling and reporting on the progress toward pollution reductions from all sources. MDE is currently collaborating with MDA in the development of a tracking process using the electronic registry and web-based system that already supports tracking of agricultural credits and publicizes agricultural trading opportunities, trade transactions, and program progress and performance.

MDE and MDA will track the actions of trading partners, compliance with trade agreements, and any enforcement action taken. The results of such individual and statewide program evaluations will be made available to the public as appropriate and through an online annual report.

Section III

Regulated MS4 Jurisdiction Trading

Background

One of the goals of the Maryland Nutrient Trading Policy Statement is to provide additional options and flexibility for the regulated MS4 community in achieving permit compliance with the impervious surface area restoration requirement and progress toward meeting Bay nutrient and sediment reduction requirements described in WIP I and II strategies through the purchase of credits. Under this Trading Policy, transactions may occur between point sources (e.g., WWTPs and regulated MS4 jurisdictions) and between point sources (e.g., regulated MS4 jurisdictions) and nonpoint sources (e.g., agricultural operations).

The goals of Maryland's NPDES MS4 permits are to control stormwater pollution, improve water quality, and achieve water quality standards Bay nutrient and sediment reductions. The permits require MS4 jurisdictions to perform watershed assessments, develop watershed restoration plans as part of the Chesapeake Bay TMDL urban stormwater strategy, and restore 20 percent of unmanaged impervious areas within the permit term. The WIPs provide a schedule for implementing BMPs to reduce pollution and attain water quality standards. Although the utilization of urban BMPs will improve local water quality, the MS4 permits further require jurisdictions to establish restoration plans to eventually attain all local impairments. One of the guiding principles of Maryland's Trading Policy is the protection of local water quality. The use of trading does not relieve jurisdictions of the responsibility to address local water quality issues.

Maryland's Accounting for Stormwater Wasteload Allocations and Impervious Acres Treated, the Guidance Document incorporated into Phase I MS4 permits to help guide restoration work, recognizes that alternative best management practices, new technology, and innovative methods may be utilized to meet permit restoration goals. Accordingly, the use of nutrient trading as such an alternative or innovative practice is authorized under current MS4 permits, and may be utilized in accordance with the options outlined in this manual.

A regulated MS4 jurisdiction could also generate credits to sell once it meets eligibility requirements. Trading requires all credit trades to comply with any local TMDL allocations, and prohibits causing or contributing to any local violations of water quality standards.

The options described in this Trading Manual will allow a portion, not to exceed 10 percent, of each regulated MS4 jurisdiction's impervious surface area restoration requirement to be achieved through BMPs implemented from the agricultural and wastewater point source sectors.

1. Key Principles

The NPDES MS4 permits require jurisdictions to restore impervious surfaces where there is little or no stormwater management as part of plans to implement BMPs to attain local WLAs in approved TMDLs. Under the 2015 Phase I MS4 permit (2015 permit), this portion is equal to 20 percent and is referred to as the 20 percent impervious area restoration requirement.

Regulated MS4 jurisdictions may choose to meet the 20 percent impervious area restoration requirement through a combination of acceptable stormwater management BMPs, alternative practices, or new, innovative practices according to MDE's "Accounting for Stormwater Wasteload Allocations and Impervious Acres Treated" (August 2014 Guidance). As one such new practice, one-half of this impervious area restoration requirement per permit term is now allowed to be met through the purchase of agricultural nonpoint source or wastewater point source credits.

The following Key Principles apply to the acquisition and sale of credits by regulated MS4 jurisdictions:

- Regulated MS4 jurisdictions are allowed to meet one-half of the impervious area restoration requirement each permit term through trading with point and/or nonpoint sources.
- Point and nonpoint source credits can be acquired at any time during the permit term to meet up to 10 percent of the MS4 jurisdiction's restoration requirement.
- Regulated MS4 jurisdictions will be responsible for ensuring continuing credit certification and verification.
- Regulated MS4 jurisdictions must acquire a sufficient amount of credits to meet retirement and other ratios as described by the Draft Trading Manual.
- Regulated MS4 jurisdictions must report both a number of acquired and/or sold credits in annual reports submitted to MDE.
- Regulated MS4 jurisdictions must acquire credits in perpetuity, or replace expired credits with new credits and/or eligible stormwater management BMPs of equivalent impervious acres.
- After a regulated MS4 jurisdiction has met its impervious area restoration requirement for a permit term (20 percent per the 2015 permit), but before the expiration of the current permit, it may generate credits through the installation of BMPs according to the Guidance and then sell or exchange those credits.
- Credits sold or exchanged by a regulated MS4 jurisdiction are not eligible to meet the seller's impervious area restoration requirement for the current NPDES permit term.

2. MS4 Eligibility Requirements; Trading Baselines

A regulated MS4 jurisdiction is eligible to acquire credits if no outstanding permit violations exist and the jurisdiction demonstrates to MDE that it is working toward meeting all other requirements of its permit. A regulated MS4 jurisdiction may not sell or exchange credits until it has met the full current permit impervious area restoration requirement, is working toward all other requirements of the permit, and has no outstanding permit violations.

3. Credit Requirements

The following requirements apply to all credits, acquired or generated:

- Agricultural credits may be generated only from a pollutant reduction activity that has been certified, verified, and registered in accordance with provisions described in the Draft Trading Manual, consistent with the proposed new Regulations, COMAR 15.2012, Agricultural Nutrient and Sediment Credit Certification Program
- Agricultural credits shall meet all MDA requirements
- Stormwater management BMPs that are implemented in excess of MS4 impervious area restoration requirements can be used as credits
- Stormwater management BMPs can generate credits only when they are installed and fully functioning
- Credits may only be applied in the year in which they are generated and cannot be banked for future years
- Credits must not cause or contribute to any local water quality impairment or violate water quality standards

4. Applying MS4 Restoration Requirements to Trading

Under the 2015 permit, an estimated total of 34,280 impervious acres must be restored by all Phase I MS4 jurisdictions to fulfill the impervious area restoration requirement. With trading, one-half of each jurisdiction's impervious area restoration requirement per permit term is now allowed to be met through the purchase of agricultural nonpoint source or wastewater point source credits. As is shown in the table below, an estimated total of 17,140 acres is eligible for restoration through credit purchases for all Phase I MS4 jurisdictions under the 2015 permit. Table 1 outlines total acres of unmanaged impervious area, the required 20 percent (20%) impervious area restoration, and the ten percent (10%) impervious area eligible to be restored through credit purchases for each of Maryland’s Phase I MS4 jurisdictions based on current estimates.

Table 1. Example: Phase I MS4 Impervious Area Restoration Requirements and Acres Eligible for Trading Under 2015 Permit

Phase I MS4 Permittee	Impervious area* (acres)	20% of Impervious area (acres)	10% of Impervious area (acres)
Anne Arundel	14,877	2,975	1,488
Baltimore City	23,373	4,675	2,337
Baltimore County	28,983	5,797	2,898
Carroll	9,285	1,857	929
Charles	2,607	521	261
Frederick	6,725	1,345	673
Harford	8,308	1,662	831
Howard	11,453	2,291	1,145
Montgomery	21,460	4,292	2,146
Prince George's	22,020	4,404	2,202
SHA	22,301	4,460	2,230
TOTAL	**420,273**	**34,280**	**17,140**

*Impervious acres are estimates based on recent Phase I MS4 annual reports and are for illustrative purposes only.

MDE has developed a method in the Guidance to relate the reduction in pollutant loads from new and alternative treatment practices into an equivalent impervious acreage. For this Trading Manual, the load calculations from the Guidance have been updated to reflect new information provided in the CBWM version 5.3.2 and are to be used in estimating the number of credits needed.

The impervious area equivalent method is based on the difference in pollutant load, or the Delta, between one acre of urban impervious runoff and one acre of forested runoff. For example, when one acre of impervious land is converted through treatment to the equivalent of one acre of forested land, 12.26 lbs/acre/year of TN runoff is reduced at the Edge of Stream (EOS), (see Table 2 below). Because one agricultural credit, which can be generated by a variety of agricultural practices described in Section IV, is equivalent to one lb/acre/year of TN and TP, and one ton/acre/year of TSS, one equivalent impervious acre of restoration is achieved through trading for 12.26 TN credits, 1.62 TP credits, and 0.53 TSS credits.

Table 2. CBP Pollutant Loads for Impervious and Forest Cover

Parameter	Impervious (lbs/acre/yr)	Forest (lbs/acre/yr)	Delta (lbs/acre/yr)
TN	15.34	3.08	12.26
TP	1.70	0.08	1.62
TSS (tons)	0.56	0.03	0.53
Source: CBWM 5.3.2 Maryland statewide average urban loading rates without BMPs provided by the Science Services Administration (SSA), MDE, 2015.			

5. Trading Ratios

The following trading ratios will apply to regulated MS4 jurisdiction trading:

- Agricultural Retirement Ratio = 10%
- Point Source Retirement Ratio = 5%
- All applicable Delivery Ratios

The table below illustrates the estimated total number of credits, based on the impervious acre equivalent is 12.26 lbs of TN, 1.62 lbs of TP, and 0.53 tons of TSS, that can be applied toward meeting portion (10%) of the MS4 impervious area restoration requirement.

Table 3. Estimated Total Number of Credits Needed to Meet 2015 Phase I MS4 Impervious Area Restoration Requirement

Phase I MS4 Permittee	10% of impervious acres	TN credits	TP credits	TSS credits
Anne Arundel	1,488	18,243	2,411	789
Baltimore City	2,337	28,652	3,786	1,239
Baltimore County	2,898	35,529	4,695	1,536
Carroll	929	11,390	1,505	492
Charles	261	3,200	423	138
Frederick	673	8,251	1,090	357
Harford	831	10,188	1,346	440
Howard	1,145	14,038	1,855	607
Montgomery	2,146	26,310	3,567	1,138
Prince George's	2,202	26,997	3,567	1,167
SHA	2,230	27,340	3,613	1,182
TOTAL	**17,140**	**210,136**	**27,767**	**9,084**

6. Ensuring Local Water Quality; Defining Trading Areas

One of the guiding principles of Maryland's Trading Policy is the protection of local water quality by the acquisition of credits. For example, the exchange of credits may not contribute to violations of any permit requirements, and both credit user/buyers and credit generator/sellers must demonstrate consistently that they are in compliance with all laws, regulations, and programs at the federal, state, and local levels.

It is important for regulated MS4 jurisdictions to address local water quality first when trading so that citizens can see the results from local expenditures, lending public support to the State's trading policies. Based on the principle of protecting local water quality, regulated MS4 jurisdictions are required to purchase credits in the following priority order:

1) Within a local watershed under a TMDL
2) Within the regulated MS4 jurisdiction's boundary
3) Within any eight-digit watershed that extends beyond the regulated MS4 jurisdiction's boundary
4) Within Maryland Trading Regions (only after the three priorities above have been exhausted)

7. Public Outreach and Stakeholder Involvement

All credit purchases and sales by the regulated MS4 jurisdictions will be reported in annual reports submitted to MDE as required under the MS4 permit. Each jurisdiction is required to make these reports available to the public by posting them on the jurisdiction's website.

8. Verification Procedures

MDA requires annual or bi-annual verification via the State or a third party for each credit generating practice. In addition, a spot check will be performed by MDA of at least ten percent (10percent) of all credits generated in any year. Additional verification is provided by MDE's SSA, which administers the State's Bay TMDL WIPs. SSA provides quality assurance checks while collecting, compiling and submitting agricultural nonpoint source BMP data to the Chesapeake Bay Program. Finally, MDE's Water Management Administration (WMA) will require regulated MS4 jurisdictions to produce proof of credit purchases by providing information on the number of acquired credits, MDA's certification of these credits, and locations of BMPs. This documentation must be recorded, tracked, and clearly posted on MDA's web-based registry as part of the public transparency protocols.

Regulated MS4 jurisdiction credit transactions with wastewater point sources will be formalized through permit modifications that specifically allocate point source credits for regulated MS4 jurisdiction compliance. Credits generated by wastewater point sources will be verified by MDE's WMA.

9. Compliance

As explained in the section "MS4 Eligibility Requirements; Trading Baselines", a regulated MS4 jurisdiction is eligible to purchase credits only if no outstanding permit violations exist and the jurisdiction demonstrates to MDE that it is working toward meeting all other requirements of its permit. In the event of default by another source generating credits, a regulated MS4 jurisdiction using those credits is responsible for complying with the permit requirements that would apply if the trade had not occurred. Any regulated MS4 jurisdiction that does not maintain compliance with all conditions of its MS4 permit is subject to MDE's enforcement procedures in accordance with Part V of Subtitle 3 of Title 9 of the Environment Article of the Annotated Code of Maryland.

10. Summary

Trading by Maryland's regulated MS4 community has great potential to promote the achievement of local and regional water quality goals in a cost effective way. MDE has developed a method based on NPDES MS4 permit impervious area restoration requirements and the CBP's pollutant loading rates to encourage sensible trading between the stormwater sector and the nonpoint and point source sectors. Furthermore, MDE believes that the policies enumerated above strike a reasonable balance between MS4 permit impervious area restoration requirements that must be achieved through traditional stormwater controls and those that can be achieved through trading. Ultimately, the exchange of credits by the regulated MS4 community with other nonpoint and point source sectors could encourage water quality improvements at a faster pace and lower cost for all involved.

Section IV

Agricultural Credit Generation and Acquisition Guidelines

Section I of the 2016 Trading Manual includes MDE Policy Statement, outlines Guiding Principles for Trading in Maryland, and delineates Key Provisions, which apply to all sources and trading partners. Section IV of the 2016 Trading Manual describes Key Principles and policy to provide guidance on the generation and exchange of agricultural nutrient and sediment credits.

Background

Section IV uses the 2008 Phase II–A and Phase II-B Policy and Guidance documents governing the generation and acquisition of agricultural nonpoint source credits as its basis. The two documents have now been combined to provide essential information to all trading partners on the requirements and procedures for participating in trading. It is anticipated that the water quality trading with the agricultural community will provide financial incentives to farmers and landowners, who would be the credit generators and sellers, for the implementation of additional practices to reduce runoff and emissions. The potential users, or the buyers of agricultural credits, would be public and private entities, regulated and non-regulated sources, and other interested watershed stakeholders. The terms credit generators and credit sellers, as well as credit users and credit buyers, will be used interchangeably in the text below. This section is both an extension and an integral part of the Maryland Trading Policy.

Maryland's Trading Registry and Marketplace

Maryland's agricultural trading program is a performance, not a practice-based, program. To provide the infrastructure to support trading activities, MDA developed the MNTT, now incorporated in the CBNTT. MDA uses the Maryland-specific calculation component of this web-based platform to determine baseline compliance, estimate nutrient and sediment loads and reductions, and compute credits generated by agricultural BMPs. In addition to the calculation tool, platform components include: a registry to record and track certified credits and catalogue completed trades; a marketplace to enable participants to post, track, and trade credits; an administrative module to assist in the supervision of the overall program and the generation of relevant reports; and an interactive mapping feature to delineate field boundaries and retrieve and forward allied information. The registry portion of the platform is being upgraded to include similar trading information for point sources and other nonpoint sources. The online trading platform can be found on the Maryland Nutrient Trading Program website (www.mdnutrienttrading.com).

Credit Market Structure

The exchange of credits between nonpoint sources, point sources, and third parties will be conducted via individual agreements. As noted above, the website contains a marketplace where trading partners, both buyers and sellers, can post registered credits for sale, as well as credit needs and bids. While the State has made the electronic marketplace available, its use is not mandatory in the execution of trades.

The following provisions apply to Maryland Agricultural trades:

- Credit Pricing: Agricultural prices will be a function of market activities and will not be set by the State or other entity not party to the trade.
- The Role of Aggregators and Brokers: The State supports the role of aggregators who may work separately with operators/landowners to purchase and collect credits for purposes of re-selling these credits to entities in need of credits. The State also supports the role of brokers who may work to help negotiate bilateral trades between credit buyers and credit sellers.
- Registry/Public Record: The Trading Program will maintain a credit registry and track the generation and sale of agricultural credits, as well as other pertinent data. A subset of this information will be made publicly available.
- Retirement Ratio: An agricultural nonpoint source retirement ratio will be applied and represents the percentage of the total generated credits to be retired towards net water quality benefit. The retirement ratio applies to all credits sales and will be set at 10 percent of total credits in a transaction.

1. Key Principles

In addition to the Guiding Principles and Key Provisions, which are delineated in Section I, and apply to all trading parties, the following Key Principles apply to the generation and acquisition of agricultural credits.

- Trades must occur only between eligible parties
- Any generator of agricultural nonpoint source credits must first demonstrate that baseline water quality requirements for the watershed have been met. The entire farm tract in aggregate must meet the more stringent of the Bay TMDL for each watershed or the local TMDL that has been adopted for an impaired waterbody
- Agricultural credit generators and users must be in compliance with all local, state, and federal laws, regulations, and programs
- Agricultural trades cannot cause nor contribute to a degradation of water quality locally, downstream, or Bay-wide

- BMPs funded by federal or state cost-share or county mitigation banking programs cannot be used to generate credits during the contractual life span of the project
- Water quality trading is not intended to accelerate the loss of productive farmland. Therefore, credits will not be generated under this policy by taking whole or substantial portions of farms out of production solely to provide nutrient credits for use off site
- An agricultural practice can generate credits only when it is installed or placed in operation
- The exchange of credits between nonpoint sources, point sources, and third parties shall be conducted via individual agreements.

2. Agricultural Credit Generators/Sellers; Eligibility

There are two steps necessary for an agricultural trade. The first step consists of an assessment of eligibility to trade and the ability to generate credits above the baseline requirements. The second step involves the certification, registration, and verification of credits, and the administration of trades by the State of Maryland. Below are the eligibility and the baseline requirements, as well as guidelines for generating and selling agricultural nutrient and sediment credits.

2.1 Credit Generator Eligibility

In order to sell credits as part of this program, agricultural operations need to meet the following requirements:

- Must be in compliance with all applicable federal, state and local laws, regulations, and programs
- Must have a current Nutrient Management Plan (NMP), an implemented Soil Conservation Water Quality Plan (SCWQP), and, if applicable, a Waste Management System Plan (WMSP)
- Meet agricultural baseline requirements

2.2 Who May Sell Agricultural Credits

Generation of an agricultural credit for sale involves the reduction or prevention of a set amount of a pollutant from entering local surface or ground waters. Examples of generators and sellers include but may not be limited to the following:

- Farm owners
- Landowners
- Renters or lessees who can demonstrate permission from the owner to generate and sell credits
- Aggregators and brokers
- Maryland state entities
- Parties engaged in removing agricultural nutrients from the environment

2.3 Eligibility of Aggregators and Brokers

Any entity wanting to acquire and resell credits, such as an aggregator or broker:

- Must be in compliance with all applicable federal, state, and local laws, requirements, and programs
- Must demonstrate an intent and ability to acquire and deliver sufficient credits from multiple projects or sites to cover both the sale and reserve requirements
- Must be able to provide a written permission by the credit generator to resell credits
- Must provide documentation that the credit generator meets all compliance and eligibility requirements

3. Agricultural Trading Baselines

Maryland's agricultural nonpoint nutrient trading program requires operators of agricultural entities or other landowners wishing to generate credits to have achieved a level of nutrient or sediment reduction known as a baseline.

3.1 Baseline Requirements for Agricultural Nonpoint Sources

Baselines are applied to the crop or pasture fields being used to generate credits. To establish baseline compliance, a seller must first achieve the more stringent of:

a) The annual Chesapeake Bay TMDL allocation for agriculture in the applicable basin; or
b) The annual local TMDL allocation adopted for the watershed segment where the credits are generated.

An agricultural operator/landowner has to ensure that the entire farm operation in aggregate has achieved the appropriate loading rate. Any animal confinement area must be in compliance with specific practice-based requirements in order for the whole tract to meet baseline.

3.2 Baselines as Annual Loading Allocations

Baselines, or numeric per-acre annual loading allocations, for each of the State's five major basins are determined by the calculation of nitrogen, phosphorous, and sediment Edge-of-Segment Loads (in pounds per acre) derived from the CBWM 5.3.2 . Local TMDL load reductions for impaired watersheds are established by MDE.

3.3 Individual Nitrogen, Phosphorus, and Sediment Baselines

Nitrogen, phosphorus, and sediment baselines are calculated and treated individually. If baseline is met for one pollutant, credits can be generated and traded for that one pollutant, nutrient or

sediment, even if the baselines for other pollutants are not met.

3.4 Baselines/Funding sources

An agricultural operator or landowner may utilize federal and state cost-share or county mitigation bank programs to implement BMPs used to meet the baseline nutrient reductions.

3.5 Eligible Practices

Any combination of current Bay Program-approved, Category I (see Section 5 below) agronomic and structural practices can be utilized to meet baseline load reductions. Baseline requirements may also necessitate implementation of additional BMPs to achieve the necessary load reduction.

3.6 Maryland Nutrient Trading Tool

Determination of whether the agricultural operation has reached the target per acre loading shall be made using the MDA-approved, performance-based calculation tool, the MNTT, that is a component of the CBNTT. The tool is available online at the trading program's website, www.mdnutrienttrading.com.

4. How to Generate Credits

Once an eligible landowner or operator has determined that baseline requirements for the watershed have been achieved, the implementation of additional water quality improvements can be considered as a tradable credit. Detailed below are the guidelines for the generation and sale of agricultural credits.

4.1 Generating Credits

Tradable credits can be generated from any Category I (see Section 5 below) planned agronomic, land conversion, or structural practice, which is shown to reduce nutrient and sediment loadings below the applicable baseline. Credits will be determined using BMP efficiency rates that utilize the latest science and technical information. MDA's approval will be contingent on the review of all aspects of the credit generation proposal and methods, as well as calculations for determining nutrient reductions that occur from activities that reduce nutrient application, increase nutrient uptake and retention, or result in net export of nutrients from the watershed.

4.2 Timing of Installation of Practice and Credit Generation:

A practice can generate credits only when it is installed and functioning. Because practices will be installed at different times during the year, the total estimated annual credits generated from any

practice installed within a given year will be considered to be generated the following year starting January 1. For example, installing a wetland in June of 2016 means that the annual credit will be given to that project starting with calendar year 2017.

All practices must be installed and maintained according to USDA/NRCS or MDA's approved specifications. Consistent with the CBWM, multi-year projects with variable credit production capacity will be assumed to generate credits that reflect average annual performance.

4.3 Credits may only be applied in the year in which they are generated

Credits may only be applied in the year in which they are generated and cannot be banked for future years. For example, if an agricultural BMP generates an average of 100 credits per year and has a life span of five years, 500 credits cannot be applied in the fifth year.

5. Agricultural Credit Generating Practices

Agricultural credit-generating practices include Category 1 Practices.

5.1 Category 1 Practices-BMPs with the Bay Program Approved Load Reductions

There are practices that are currently in widespread use and have well-established and understood nutrient removal efficiencies. The installation and maintenance specifications for these practices are well documented. Currently, all "Approved BMPs" listed in Table 1 below are in this category. These practices have received a rigorous peer review by the Chesapeake Bay Program. Their efficiencies are discounted by varying percentages and given conservative value. They have been incorporated into online calculation tool, which will apply their appropriate loading rates.

Agronomic Practices

Credits can be generated from existing or planned Category 1 agronomic nutrient reduction practices that do not count towards the baseline requirements. Such agronomic practices reduce or minimize surface, groundwater, or air emissions, and examples include reductions in nitrogen fertilizer application, precision agriculture, cover crops, and no-till. Since these practices must be done every year to generate credits, they are considered annual practices for the year they are employed, regardless of what year the practices were first initiated.

Structural Practices

Planned structural Category 1 practices may generate credits and may generate them over multiple years as long as they are properly maintained. Such practices reduce or minimize nutrient or sediment loss through the construction or installation of physical edifices, barriers, or systems to trap, block, or filter pollutants and examples include manure sheds, grassed waterways, constructed

wetlands Credits can be generated from existing structural investments that do not count towards the baseline requirements if the structure was funded through state or federal cost-share or county mitigation programs but has exceeded its "funded lifespan," i.e. the standard NRCS structural lifespan or Maryland agricultural cost-share (MACS) requirement, and is now being maintained by the owner/operator at his own expense. These latter structural practices will require re-certification to ensure that they have been properly maintained and are still functioning effectively.

Agricultural Land Conversion

Credits can be generated from the conversion of several types of agricultural land to a less nutrient-intense land use. Examples include: riparian forest buffer, riparian grass buffers, wetlands, and conversion to alternate crops. Credits cannot be approved for the idling of whole or substantial portions of productive farm for the sole purpose of providing nutrient credits. Credits can only be generated for conversions that do not count towards the baseline and meet all the eligibility criteria of a structural practice.

5.2 Potential Future Trading Options

Category 2 Practices - BMPs Requiring Technical Review

These are practices that are currently in use but require additional technical review to ascertain the appropriate nutrient removal efficiencies and installation and maintenance specifications. MDA and the trading program's Technical Review Committee reserve the right to adjust the uncertainty ratio applied to these practices to reflect a higher degree of uncertainty in nutrient removal efficiencies. Some of these practices, however, may be in the initial stage of the CBP peer review process and already may have been given interim efficiencies. Practices in this category are also listed in Table 1 below.

Category 3 Practices - Other BMPs

These are innovative practices that are not in widespread use and for which no recognized estimates of nutrient removal capacity exist. These practices will be examined by MDA and the trading program's Technical Review Committee to ascertain appropriate specifications for project installation, monitoring, and maintenance and to determine an appropriate uncertainty ratio. The approval process for these credits will likely take longer than that of the BMPs currently in use but requiring technical review. Potential practices that fall into this category are listed in Table 1 below.

Category 2 and 3 practices will be reviewed on a case-by-case basis and may include requirements for demonstration projects, the collection of sufficient data to evaluate results, and any other information needed to determine the validity of the credits. In some cases, development of the specifications and certification of the credits in these categories could be a multi-year process.

TABLE 1. TRADEABLE BMP'S

Category 1 BMPs with Approved Load Reductions	Category 2 BMPs Requiring Technical Review	Category 3 Other BMPs Requiring Technical Review
Riparian/Conservation Forest Buffers	Phosphorus Sorbing Materials	Bioreactors
Riparian/Conservation Grass Buffers	Oyster Aquaculture	Greenseekers
Wetland Restoration	Algal Turf Scrubbers	
Tree Planting	Floating Wetlands	
Water Control Structures	Irrigation Management	
Stream Restoration	Manure Management	
Horse Pasture Management		
Cover Crops (Early and Late Planting)		
Commodity Cover Crops		
Alternative Crops		
Cropland Conversion		
Dairy Precision Feeding		
Precision Grazing		
Decision Agriculture		
Enhanced Nutrient Management		
Conservation Tillage		
Continuous No-Till		
Animal Waste Management: Livestock		
Animal Waste Management: Poultry		
Barnyard Runoff Control		
Loafing Lot Management		

Table 1 represents the most current list of practices for credit generation. This list is not inclusive and will be modified as needed.

6. Trading Ratios

Trading Ratios are used to calculate the credits that can be derived from nutrient reduction activity. They serve to 1) translate how various activities on a parcel of land result in delivered pollutant load reductions; 2) account for inherent uncertainties in nonpoint source load reduction estimates; 3) account for the BMP locations within the Bay watershed. MDA utilizes the following ratios:

6.1 Delivery Ratio

MDA uses the Delivery Ratio to simulate the diminished physical and biological processes that occur on nutrient loads as they travel downstream; thus, a pound of nitrogen that is released in the

upper watershed has less impact on the bay than a pound of nitrogen released at the mouth. This is not necessarily the case for sediment.

Two types of Delivery Ratios are applied:

Edge of Segment Delivery Factor (EOS)

Edge of Segment Delivery Factor is the amount of land-applied nutrients expected to reach the surface waters at the boundary of the watershed model segment through surface runoff, groundwater flows, and atmospheric deposition. The EOS factor represents an adjustment between the edge-of-field nutrient load as calculated by USDA's national Nutrient Tracking Tool (NTT) and the edge-of-segment load as defined by the CBWM.

In-Stream Delivery Factor (DF)

The In-Stream Delivery Factor is a function of the distance from the edge of the watershed segment to the fall line of the Chesapeake Bay. The delivery factor is derived from the CBWM and represents the pollutant effect of the reductions between upstream and downstream points.

6.2 Uncertainty Ratio

Uncertainty ratios are used to provide a margin of safety and ensure that water quality goals are being met. The efficiencies of BMPs in the Watershed Model are discounted by varying percentages and given conservative values to compensate for possible discrepancies in the relationship between credit generation models and actual resulting pollution reductions. The application of additional uncertainty ratios may be required by the State.

6.3 Retirement Ratio

A retirement ratio represents the percentage of the total generated credits to be retired towards net water quality benefit. The retirement ratio applies to all agricultural credits at the time of sale and will be set at 10 percent of total reductions and will be paid for by the buyer.

7. Agricultural Credit Certification Process

The completion of a Maryland Agricultural Nutrient Credit Certification and Registration Form (CCR), (Attachment A) is necessary to enable MDA to review all aspects of the credit generation proposal and to ensure that the existing farm conditions and proposed enhancements will meet the requirements of the agricultural nutrient trading program. CCR forms can be downloaded from the Maryland Nutrient Trading Program website (www.mdnutrienttrading.com). The completed form and all other required information should be submitted to the Maryland Department of Agriculture, 50 Harry S. Truman Parkway, Resource Conservation Operations, Annapolis, MD 21401 Attention:

Nutrient Trading Program.

7.1 Application/Credit Review

A person who applies to MDA for approval of agricultural nonpoint source nutrient or sediment credits shall:

- Complete and sign the CCR form provided by MDA
- Furnish a copy of the Farm Summary Worksheet generated by the MNTT
- Provide a copy of the current NMP
- Provide a copy of the current SCWQP with a map identifying the location and boundaries of the operation and showing field identification numbers, field acreage, and the location of BMPs
- Provide the specifics of any credit generation proposal

MDA will review applications to verify that:

- Generator is eligible to sell credits
- All legal and regulatory compliance requirements are met
- Baseline requirements are met
- All credit generating improvements qualify for certification
- The landowner and the operator have consented in writing to all of the requirements and the waiver of confidentiality for any information the operation submits to MDA, including but not limited to the operator's NMP and SCWQP
- Credit calculations and all other information, are correct, and
- Necessary identifying and USDA/FSA tract information has been provided.

7.2 Credit Approval/Certification

MDA or its designee shall visit farm operation to verify that the baseline requirements are met and that the applicant's credit generation proposal is effective and appropriate for reducing the discharge of nutrients from the farm. In addition, credit certifications pending implementation of a BMP or other improvements are subject to further inspection to verify that the proposed generating practice is in place and functioning properly before final certification is granted.

Proposals for improvements for generating credits will be reviewed by MDA, and may include requirements for:

- Demonstration projects
- Collection of sufficient data to evaluate results, and
- Any other information needed to determine the validity of the credits

In some cases, as noted in 5.2 above, development of the specifications and certification of the credits could be a multi-year process.

Once verification is complete, MDA:

- May issue a pre-certification of credits based on pending implementation of the proposed improvements
- May request more information and will require a technically proficient and certified third-party verifier to conduct an on-site examination prior to the final certification of credits.
- May also require some additional contractual obligations and/or direct monitoring to ensure the load reductions are met

MDA shall only certify credits once the practice or practices generating those credits are installed and fully operational. All back-up documentation shall be maintained for a minimum of 10 years.

Upon completion of the review and approval of any application for agricultural nutrient and sediment credits, MDA will:

- Assign each credit a unique registration number, which will recorded in the Maryland's Trading Registry
- Track each registered credit

For projects not meeting MDA's certification standards, MDA will:

- Return documents which do not meet credit certification standards to the applicant with the reason(s) for non-approval
- Document the basis for denying an application and provide this information in writing to the applicant

As required by law, all records concerning the certification of credits shall be maintained by MDA and shall be made available for public review in accordance with requests made under the Maryland Public Information Act.

8. Verification

8.1 Annual Verification and Reporting

All trades involving agricultural credits certified by MDA require, at minimum, annual credit verification and reporting. Inspections will be scheduled as appropriate to practice type.
A person who buys certified credits shall employ an MDA-approved verifier who does not hold an interest in the agricultural operation generating the credits or was not in involved in the original application or qualification of the credits. Following the site visit to the agricultural operation, the

verifier shall provide the following to MDA:

- Information as required on a Verification Report form, and
- Information following an inspection and review of the records for the agricultural operation including:
  - Review of the current NMP and documentation that it continues to be implemented in accordance with MDA's regulations
  - Review of the current SCWQP and documentation that it continues to be implemented and addresses all nitrogen, phosphorus, and sediment runoff and emission issues as specified
  - Documentation that the agricultural management and BMPs implemented continue to meet baseline compliance and that all credit generating practices continue to be operated and maintained in accordance with the terms of the trading contract, and
  - Confirmation that no deficiencies exist and no corrective measures are needed or a detailed description of deficiencies and required corrective actions.

MDA and MDE, the buyer and the seller, and the owner and/or operator shall receive a copy of the report prepared by the verifier conducting of any inspection and records review within 30 days. MDA may issue a corrective action order which allows a time period for repairs or other remedies to bring any deficiencies into compliance. MDA may require additional inspections and written substantiations that corrective measures have been taken. Any such action(s) by MDA does not preclude MDE from exercising its authority when agricultural credits are incorporated into issued discharge permits.

Within 30 days of receiving a copy of the report, an owner or operator may dispute information in the report that owner or operator believes is in error or does not accurately represent the condition or management of the operation and may address these concerns by writing to MDA and copying the verifier.

MDA shall schedule site reviews and records inspection on at least 10percent of all traded credits annually.

8.2 Verifiers

MDA shall maintain a list of approved verifiers who:

- Meet MDA's qualifications as described below
- Do not hold an interest in the agricultural operation generating certified credits; and are not the same individuals who conducted either the assessment or verification of the operation at the time of application

8.3 Verification Process Requirements

Verifiers approved by MDA to conduct interim inspections and reviews shall:

- Contact the operator in advance of the inspection to make an appointment so the operator or his representative can be present and have records available for the review
- Present a photo identification at the time of the inspection as proof of credentials, and
- Adhere to all biosecurity and other measures necessary to protect health and safety at the operation

An owner or operator may dispute information in the report that the operator believes is in error or does not accurately represent the condition or management of the operation and may address these concerns in writing to MDA and copying the verifier within 30 days of receiving a copy of the report.

MDA may conduct an investigation that may include additional inspections to determine the actual condition and management of the operation.

8.4 Verifier Approval Protocol

An individual may not be approved to act as a verifier unless the individual meets the following requirements:

- Education and experience
- Training, and
- Continuing education

MDA may approve a verifier who meets the following eligibility requirements:

- Has three (3) or more years of experience developing SCWQPs or qualifies as a USDA/NRCS Conservation Planner, Level II
- Is certified in Maryland to prepare NMPs, and
- Has completed MDA's training in the use of the MNTT

A verifier may only remain eligible to perform verifications by completing at least 6 hours of MDA's approved training within the first year, and 12 hours thereafter every three years.

After the opportunity for a hearing, MDA may deny, suspend, or revoke the approval of any verifier who:

- No longer meets eligibility requirements
- Violates any of the regulatory requirements of this chapter
- Provides MDA with any misleading, false, or fraudulent report
- Fails to promptly provide any report or any record required to be kept by this chapter
- Fails to meet the continuing education requirements for verifiers
- Is determined to be negligent or incompetent, or

- Fails to act in such a manner that MDA determines provides other good cause to deny, suspend, or revoke approval

9. Enforcement

9.1 Suspension or Revocation of Credit Certification.

MDA may suspend or revoke certification of an agricultural nonpoint source nutrient credit for any violation of Title 8, Subtitle 9 of the Agriculture Article, Annotated Code of Maryland, or the following:

- Failure to adopt or install any practice or activity certified pending implementation in conformity with standards and specifications or to differ substantially from the original credit generation proposal
- Failure to maintain any practice or activity as required by the operation's SCWQP
- Failure to take timely steps to remedy any deficiencies reported by the verifier, in response to a corrective action order by MDA, or as a result of MDA's review
- Failure to continue to meet baseline
- Failure to sell credits during their certified lifespan, and
- Performance of any other action or failure to act in such a manner that MDA determines provides other good cause to suspend or revoke the certification

MDA will initiate the decertification process with a corrective action order and will notify MDE of the intent to decertify credits. Failure to resolve the situation in a timely manner and pass re-inspection will result in the issuance of a decertification notice from MDA to the registered credit owner, MDE and all other affected parties. Notice of decertification will also be published on the trading program website.

An owner or operator may dispute findings of violations or failures by requesting an opportunity to be heard in writing to the Secretary of Agriculture within 30 days of receiving notice. Suspension or revocation of credit certification does not preclude any other punitive action that may be taken by another public or private entity.

10. Mechanism to Sell Credits

While trading in Maryland is based on a free market system, the State, as described earlier in this section, supplies the infrastructure to support trading. MDA utilizes an online, central registry to record and track agricultural credits that have been certified and assigned unique registration numbers. The registry also catalogues completed trades and serves as a transparent, public forum for conveying relevant information about credits and trades to all interested parties. The marketplace component provides a central location for the exchange of nitrogen, phosphorus, and sediment credits. Sellers may post credits to the individual market for each pollutant and buyers may post the type of credit needed. Its use is not mandatory, but the marketplace affords a readily

accessible setting for both parties to negotiate and effect credit transactions.

11. Agricultural Credit Buyers/Users; Eligibility

The sale of certified agricultural credits to potential buyers/users is described below. The sale/exchange of credits between nonpoint sources, point sources, and third parties will be conducted via individual agreements. The buyers, users of the agricultural credits, will have to meet the following eligibility guidelines:

11.1 Who May Buy Credits?

Trading may take place between any combination of eligible parties (point sources, farmers, landowners, NGO's, or aggregators and brokers). Both public and private entities are eligible to participate in trades. Any credit buyer/user must be in compliance with all local, state, federal laws, regulations, and programs. The following are the general categories of eligible buyers:

- Point sources needing to offset new or expanded discharges (major and minor).
- MS4 Jurisdictions
- Parties required or wanting to offset new source loads
- Private or public parties wanting to buy credits.
- Maryland State Entities
- Aggregators
- Private credit banks

11.2 The State reserves the right to limit the quantity and type of credits bought by any entity.

11.3 Trades can occur both within and outside of NPDES permits.

12. Aggregators

An aggregator is a person or entity that collects and compiles credits from individual agricultural nonpoint sources to resell them. An aggregator pools together credits from multiple projects so they can be bundled and sold as a larger package. The creation of a diverse portfolio of projects and credits also is likely to provide better protection from project default or loss than projects from a single credit seller.

Aggregators in Maryland will be required, as a minimum, to self-insure their credits against natural disasters and/or landowner default as follow:

- Acquire and maintain credit reserve, equal to at least 25 percent more credits that are necessary to satisfy all active contracts

- Purchase an insurance policy against loss and provide documentation to MDA, MDE and the buyers

13. Trading Mechanisms: Contracts

The sale/purchase of credits between nonpoint sources, point sources, and third parties shall be conducted via individual agreements. These agreements will take the form of legally enforceable contracts between the parties in one of the following combinations: credit buyer/user and credit seller/generator; credit buyer/user and credit aggregator; or credit aggregator and credit seller/generator. The contracts must contain all of the applicable minimum requirements stipulated in this policy.

The minimum requirements of the three types of contracts are as follow:

13.1 Contract Confidentially*:*

Any provisions of a contract that are not required by this policy do not have to be submitted for review and can remain confidential if the parties so desire.

13.2 Contract Format:

Use of standardized contracts will not be required. However, the required provisions that are submitted as part of the trade approval process must include the elements as specified below.

13.3 Contracts between Credit Buyer/User and Credit Seller/Generator:

- Identification and contact information of the parties, with signatures
- Location of credits
- Duration of the contract in years
- Quantity of credits to be exchanged in each year of the contract
- Methods of credit generation
- Credit prices
- Obligations of the seller, including agreement to:
  - Properly maintain BMPs or other specified facilities
  - Allow regular inspections
- Comply with all applicable federal, state, and local requirements
- Continue to meet and maintain baseline compliance
- Obligations of the buyer, including agreement to:
  - Perform required annual or biannual inspections through a certified third party
  - Provide annual inspection reports to MDE and MDA
  - Purchase additional credits necessary to meet mandated 10percent retirement ratio
  - Make prompt payment based on contract provision

- Provisions for violation of the contract terms, including monetary compensation and/ or delivery of alternative credits

13.4 Contracts between Credit User/Buyer and/or Credit Aggregator and Credit Generator/Seller and/or (Credit Aggregator):

- Identification and contact information of the parties, with signatures
- Location of credits
- Duration of the contract in years
- Quantity of credits to be exchanged in each year of the contract
- Methods of credit generation
- Credit prices
- Obligations of the seller and or Aggregator, including agreement to:
    - Ensure proper operation and maintenance of BMPs or other specified facilities
    - Supply sufficient credits in accordance with the contract/agreement
    - Provide annual inspection report to buyer and/or
    - Ensure that regular inspections are allowed
    - Comply with all applicable federal, state, and local requirements
    - Ensure baselines maintenance and compliance
- Obligations of the buyer, including agreement to:
    - Perform annual or biannual inspections through a certified third party
    - Provide, as a minimum, annual inspection reports to MDA and MDE
    - Make prompt payment based on contract provisions
    - Purchase additional credits necessary to meet mandated 10percent retirement ratio
    - Make prompt payment based on contract provisions
- Provisions for violation of the contract terms, including monetary compensation and/or delivery of alternative credits.

In addition to the minimum requirements, the parties may add supplementary elements and requirements to the contracts to address their individual requirements or preferences. This may be done so long as the additional provisions do not conflict with the contractual requirements listed above.

13.5 Accountability, Annual Verification and Inspection Process

All trading contracts shall require annual BMP verification and reporting. For annual agricultural practices, such as cover crops, inspections will be required a minimum of twice during the annual life. Independent verification by certified third parties is mandatory. For point sources, the NPDES permit is the mechanism by which trades are implemented and tracked. NPDES reporting requirements will be stipulated by MDE in the permit.

In addition, MDA or its designee will perform annual spot check inspections on a minimum of 10 percent of all sold certified agricultural credits.

14. Liability

14.1 Permitted NPDES Trades

It is anticipated that some of the demand for agricultural credits will come from permitted sources and trades will be incorporation into the NPDES permit. Under the CWA, the responsibility for meeting all permit requirements and the liability for violating them rests solely with the permittee. Hence, CWA liability for noncompliance with the trading provisions of a permit, including failure of the credit supplier to produce the required quantity of credits, remains with the permittee and any necessary CWA enforcement action will be taken against it. The permittee's contracts with credit supplier should include provisions to address credit supplier violation of the contract terms, or failure of the credit supplier to produce the required quantity of credits, which may include monetary compensation and/or delivery of alternative credits.

14.2 Non-NPDES Trades

For non-NPDES trades, MDE and MDA require that contracts between trading partners contain provisions for violation of the contract terms. The agencies, however, do not impose specific provisions or requirements, leaving them to the trading parties to determine. Both credit purchasers and suppliers should consult their legal counsel when negotiating the contractual remedies. In the event of default by an agricultural credit supplier or an aggregator to a non-permitted entity, the contract is legally enforceable for monetary damages.

14.3 Credit Supplier Self-Insurance:

This policy recognizes credits provided by agricultural non-point sources are estimated pollution reductions and that credit suppliers, particularly credit aggregators, should maintain inventories of credits sufficiently large and diverse that the supplier could be considered to be self-insured. While it is up to the credit buyer to make this judgment, the existence of such self-insurance capability would further reduce the risk to the purchaser.

15. Trade Approval Process

Contractual arrangements between potential buyers and sellers can be negotiated at any time. They can be done before or after credit certification. Upon approval of the trade, the trade will be recorded and tracked in the Trading Registry located online at the Trading Program's website. Documents that are not approved will be returned to the applicant with a reason for non-approval.

If the trade is with a generator/seller of agricultural nutrient credits and a non-permitted buyer/user,

MDA will provide review and enter trade into central registry.

The trading applications for non-permitted buyers shall provide specific information about the proposed trading arrangement. This information shall include the following:

- The owner of the credits
- The purchaser of the credits
- The trading basin
- The time period for the trading arrangement
- The number and type of discharge credits to be exchanged each year during this period
- How the number of required credits to be exchanged was determined
- Source of the credits, and
- The essential contractual arrangements as described above

Documentation of the contractual arrangements for all buyers interested in obtaining credits must be submitted with the request to MDA. The essential portion of the contract (s) between the buyer and the credit seller, whether it is a credit generator or an aggregator, must be submitted to fulfill this requirement. In addition, MDA will require submittal of an approved CCR form.

MDA or its agent may require more information or an onsite examination prior to approval of a trade. MDA also may require some additional contractual obligations and/or direct monitoring to ensure the load reductions are met. All back up documentation shall be maintained for a minimum of 10 years.

16. Future Trading Options

Innovative Practices

Some practices that are currently in use require additional technical review to ascertain the appropriate nutrient removal efficiencies and installation and maintenance specifications. There are also innovative practices that are not in widespread use and for which no recognized estimates of nutrient removal capacity exist. Both are described further in this Section as Category 2 and Category 3 practices. These BMPs cannot be incorporated into the NTT and will require the Technical Panel's review. In some cases, development of the specifications and certification of the credits could be a multi-year process. These practices are potential future credit generating practices.

Carbon Trading

Just like the nutrient and sediment markets, carbon trading offers entities under regulatory requirements a potentially more cost-effective means to meet their obligations while providing farmers and landowners the opportunity to receive compensation for implementing and maintaining

conservation practices. MDA is charged under the Greenhouse Gas Emission Reduction Act of 2009 with adding carbon credits and enhanced nutrient credits to the Maryland Nutrient Trading Program. Carbon and enhanced nutrient credits would be "stacked" onto existing nutrient and sediment credits as tradable commodities, thereby increasing the potential value of the total credit package and taking another incremental step in creating a comprehensive environmental marketplace. A public and private stakeholder advisory group started meeting in November 2009 to assess carbon mitigation activities, determine a menu of eligible practices, and develop the policies and guidelines to implement a carbon trading program, but that effort was discontinued in 2012 with the worldwide collapse in carbon credit prices. There are plans to re-convene the carbon advisory group when the nutrient marketplace is fully functioning.

Attachment A

State of Maryland
Maryland Department of Agriculture
Nutrient Credit Certification and Registration Form

1. Applicant Information: _____
First Name MI Last Name

_____
Company Name (if applicable) Title

2. Applicant Address: _____
Number Street

_____
Town State Zip

3. Property Information:
If the applicant is not the property owner or renter with control, enter the name of the owner or party in control of the property: _____
First MI Last

4. Property Address: _____
Number Street

_____
Town State Zip

5. Property Description (optional): _____

_____

6. Property County: _____ Watershed: _____

Tract Number: _____ Watershed Segment ID: _____

MD Property View Acct. ID(s): _____ Latitude: _____
_____ Longitude: _____
_____
_____

7. Total Annual Credits Generated: _____ (N); _____ (P)

Total Years: _____

8. Indicate BMPs that will be used to generate credits:

#	Land Conversion/Streambank BMPs		Acres
☐	Wetland		
☐	Land use conversion: hay		
☐	Land use conversion: grass		
☐	Land use conversion: forest		
☐	Land use conversion: perennial crop*		
☐	Forested buffer/fencing		
☐	Grass buffer/fencing		
☐	Streambank restoration	Feet	

#	Field Management BMPs		Acres
☐	Conservation tillage*		
☐	Continuous no-till*		
☐	Enhanced nutrient management*		
☐	Decision agriculture		
☐	Water control structure		
☐	Cover crop*		
		Type	
☐	Commodity cover crop*		
		Type	

#	Livestock Area BMPs
☐	Clean water diversion
☐	Heavy use area protection
☐	Heavy use area pad
☐	Runoff collection & infiltration
☐	Vegetated swales
☐	Water control structure
☐	Treatment wetland

#	Ammonia BMPs
☐	Lagoon cover
☐	Poultry litter treatment
☐	Biofilters
☐	Vegetated environmental buffers

#	Pasture BMPs	Acres
☐	Alternative watering facility	
☐	Horse pasture management	
☐	Prescribed grazing/PIRG	
☐	Fencing (forest buffer)	
☐	Fencing (grass buffer)	

Manure Management
Dairy precision feeding*
Manure export*
Poultry/swine phytase*
Manure injection*

* These BMPs are reflected in crop management scenarios as differences in crop rotation, tillage practices, manure N/P concentrations, nutrient application regimes, etc.

9. Describe any BMP used to generate credits that is not listed above:

_____

_____

10. If any BMPs are not fully implemented, list below those planned and contingent on sale, along with contingency sale date:

_____

_____

11. Category 2 and 3 BMPs (consult BMP list in Users Guide) require additional analysis and technical review. List below any BMPs in those categories:

_____

_____

12. Compliance Statements:

A. I attest that all occupied lands under my operation (owned or rented) are in compliance with Maryland Nutrient Management requirements and I maintain a current Soil and Water Quality Plan, and if applicable, a Waste System Management Plan. Furthermore, I confirm that I am following all recommendations of my plan(s). _____ (initial)

or

B. I attest that I have the authority to represent the owner or controlling party named above and affirm that the referenced lands are in compliance with Maryland Nutrient Management requirements and operate under a current Soil and Water Quality Plan, and if applicable, a Waste System Management Plan. Furthermore, I confirm that all recommendations in any of those plan(s) are being followed. _____ (initial)

C. I attest that all existing BMP's submitted to generate credits are not or no longer subject to contractual obligations under funding provided by any NRCS or MACS program: _____ (initial)

13. Any other pertinent information or additional comments may be entered in box below:

This Form Must be Accompanied by Farm Summary Worksheet from the Maryland Trading Program Website (or Similar Document) and Any Project Proposals for Planned BMPs

14. Signature: _____ _____
Date

GLOSSARY

Aggregator: A person or entity that collects and compiles credits from individual agricultural nonpoint sources to resell them.

Agronomic Practices: Annual crop and/or soil practices that reduce or minimize the probability of nutrient or sediment loss into surface and/or ground waters.

Agricultural land: Land used to produce food, feed, fiber, sod, animals, plants, trees, or plants in containers, or for out-of-ground production. Such land has an Agricultural Use Assessment as determined by the Maryland Department of Assessments and Taxation.

Baseline (Trading Baseline): Pollutant control requirements, practices, actions, loading rates or levels of reductions that must be in place before credits can be generated. All credit generators and/or sellers must first meet trading baseline, as defined in the Trading Policy, before they can enter trading market and participate in a trade, exchange or sale of credit.

Best Management Practice or BMP: BMPs include, but are not limited to, agricultural and urban, structural and nonstructural pollution control, operation, and maintenance procedures and practices that prevent or reduce pollutants and/or mitigate flooding.

Biological Nutrient Removal (BNR): A biological wastewater treatment technology capable of reducing the nitrogen in wastewater effluent to no more than 8 milligrams per liter, as calculated on an annually averaged basis.

Bubble or "Overlay" Permit: A NPDES permit issued to a group of point source dischargers that supplements individual permits by establishing permit limits and other requirements for one or more pollutant of concern that are not fully addressed in the existing individual permits. A "bubble" or "overlay" permit is an alternative group permitting approach available to either multiple owners or single owners of multiple facilities for implementing the nutrient caps. Instead of multiple caps, one for each facility in a watershed, the central owner may elect to receive a single permit with one nutrient loading cap for all of the facilities it operates in the watershed. Technology-based treatment requirements for nutrients at each of the individual facilities may also be included in either the overlay permit or in each of the required individual permits.

Cap: A legally enforceable aggregate mass load limit contained in a discharger's permit.

Chesapeake Bay Watershed Model: The Hydrologic Simulation Program used to simulate the surface water run-off, groundwater flow, and the transport of nutrient and sediments to the Chesapeake Bay.

Credit or Pollutant Reduction Credit: A measured or estimated unit of pollutant reduction per unit of time at the discharge location that can be generated and sold or exchanged in a trade. A credit is a unit of trade equal to one pound per year of nitrogen, phosphorus, or sediment adjusted to account for applicable trading ratios. A credit is created by a credit generator, in accordance with provisions and requirements of the Trading Policy, by controlling its discharge beyond what is needed to meet its baseline.

Credit Generators/Sellers: Sources that reduce pollution above and beyond their baseline requirements, and generate credits that can be exchange or sold to credit users/buyers.

Credit Users/Buyers: Entities that acquire and/or purchase credits to meet their regulatory obligations; offset new loads; or contribute towards water quality improvements, or as a reserve, insurance against credit failures.

Edge of Segment (EOS) Load: The amount of land-applied nutrients expected to reach the surface waters at the boundary of a Chesapeake Bay Watershed Model segment through surface runoff, groundwater flows, or atmospheric deposition.

Effluent Limitation Guidelines and Standards (ELGs): A regulation published by EPA under section 304(b) of the CWA that establishes national technology-based effluent requirements for a specific industrial category.

Enhanced Nutrient Removal (ENR): A wastewater treatment technology that is capable of reducing the nitrogen and phosphorus concentrations in wastewater effluent to achieve permit limits equivalent to concentrations of no more than 4 milligrams per liter TN and 0.3 milligrams per liter TP, as calculated on an annually averaged basis.

Expanded Point Source: Point Source approved by the local government requiring a higher wasteload allocation than the nutrient wasteload allocation approved in the Bay TMDL.

Floating Cap: An effluent limitation applicable to an ENR facility financed by the BRF. The floating cap is calculated at the end of each calendar year using the actual annual flow for the facility times a concentration of 4 mg/l TN or 0.3 mg/l TP and converted to units of pounds per year (lbs/yr).

Industrial Stormwater: Stormwater runoff from industrial activity

Impervious surface: Any surface that does not allow stormwater to infiltrate into the ground.

Impervious surface area: The total extent of all impervious surfaces.

Minor (Non-significant) Point Source: WWTPs with the design capacity of less than 500,000 gallons per day.

Minor Permit Modification: A discharge permit revision not requiring a formal public participation process.

Municipal separate storm sewer system (MS4): A conveyance or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, man-made channels, or storm drains): (i) Owned or operated by a State, city, town, borough, county, parish, district, association, or other public body…having jurisdiction over disposal of sewage, industrial wastes, storm water, or other wastes…; or (ii) Designed or used for collecting or conveying storm water;" [CFR 122.26(b)(8)].

New Point Source: A point source with no waste load allocation in the 2010 Chesapeake Bay TMDL.

Non-MS4 stormwater: Stormwater runoff from a conveyance or system of conveyances owned or operated by a municipality or other public body not covered under a NPDES MS4 permit.

Nonpoint Source: A source of pollution that is not from a single point of origin or from a specific outlet, i.e., not a point source. Diffuse pollution sources (i.e., without a single point of origin or not introduced into a receiving stream from a specific outlet). The pollutants are generally carried off the land by stormwater. Common nonpoint sources are agriculture, forestry, urban sites, mining, construction, dams, channels, land disposal, saltwater intrusion, and city streets.

Nonpoint Source Discharge Credit (see Credit or Pollutant Reduction Credit (Nonpoint Source Discharge Credit))

Trading: A market-based approach to achieving water quality standards which involves a transaction, the sale or other exchange, through a contractual agreement between credit generators and/or credit sellers and credit users and/or credit buyers that have been approved and/or certified verified and registered by the State agencies. The credits must reflect pollutant load differential below the credit generator's baseline.

Nutrient Reduction: (see Pollutant Reduction)

Offset: 1.) n. Offsite treatment implemented by a regulated point source for the purposes of meeting its permit limit. 2.) n. Load reductions that are acquired by a new or expanding point source from other point sources, and/or nonpoint sources, or load reductions obtained through the transfer of flow from an OSDS to an ENR facility to offset the new point source discharge within an impaired watershed, such as the Chesapeake Bay or a local tributary. 3.) v. to compensate for increased loads beyond the facility's loading baseline.

Onsite Sewage Disposal System (OSDS): Any system that disposes of sewage effluent beneath the soil surface.

Regulated Phase I MS4: A municipal separate storm sewer system owned and operated by a municipality or other public body with a population of greater than or equal to 100,000 and covered under a National Pollutant Discharge Elimination System (NPDES) MS4 permit.

Regulated Phase II MS4: A municipal separate storm sewer system owned and operated by a municipality or other public body with a population of less than 100,000 and covered under a National Pollutant Discharge Elimination System (NPDES) MS4 permit.

Point Source: An NPDES-permitted discharge to surface water from a sewage treatment plant or industrial facility

Pollutant Reduction (Nutrient and/or Sediment Reduction): The difference in nutrient and/or sediment discharges to surface and/or ground waters achieved by activities such as best management practices or technical upgrades, compared to the current load or the applicable baseline after meeting eligibility requirements. In addition, point sources may generate credits by maintaining flow at less than the design flow basis of the assigned nutrient WLA.

Registry: A system utilized to record, manage, and track certified credits and other pertinent data.

Regulated MS4 jurisdiction/regulated MS4 community: A municipality or other public body or group of municipalities or public bodies covered under a Phase I or Phase II NPDES MS4 permit.

Retirement Ratio (see Trading Ratios)

Significant Point Source: A publicly-owned treatment works (POTW) or a federal or privately owned sewage treatment plant with a design capacity of 500,000 gallons per day or greater, or an industrial point source with daily discharge loadings of nitrogen or phosphorus equivalent to a significant POTW.

Stormwater: Water that originates from a precipitation event.

Structural Controls (Agriculture): Practices with multi-year life spans that are engineered and installed to meet or exceed NRCS Standards in order to reduce or eliminate the introduction of pollutants into surface and/or ground waters.

Technology-Based Effluent Limitation (TBEL): A permit limit for a pollutant that is based on the capability of a treatment method to reduce the pollutant to a certain concentration. TBELs for POTWs are derived from the secondary treatment regulations (40 Code of Federal Regulations Part 133) or state treatment standards. TBELs for non-POTWs are derived from national effluent limitation guidelines, state treatment standards, or on a case-by-case basis from the best professional judgment of the permit writer.

Third Party: Any entity or person that assist in facilitating credit exchanges and/or verifying Best Management Practices (BMPs).

Total Maximum Daily Load: A calculation for an impaired waterbody of the maximum amount of a pollutant the waterbody can receive and still meet applicable water quality standards

Trading ratios: Discount factors applied to pollutant reductions to account for uncertainty, water quality, delivery or special need concerns. The following are examples of trading ratios:

> **Delivery Ratios:** Delivery Ratios apply discount factors to compensate for a pollutant's travel over land or in water (or both) and may be applied to all, point and nonpoint ,sources. Delivery ratios generally account for attenuation (i.e., the rate at which nutrients are reduced through natural processes, such as hydrolysis, oxidation, and biodegradation, on their way through tributaries to the mainstem of the water body). The ratio varies depending on the location of the source from the mainstem. Generally, the greater the distance the pollutant has to travel, the greater the pollutant loss will be. This ratio would work to equalize a trade between a source in the headwaters and one near the mainstem. This ratio is also often termed as "location ratio." Delivery ratios will be based on information from applicable and accepted data sources, such as the CBWM.
>
> **Retirement Ratio:** The retirement ratio represents the percentage of the total generated credits to be retired to contribute toward net water quality benefit. The retirement ratio applies to all credits generated and will be set at 5 percent (5percent) of total reductions for point sources and 10 percent (10percent) for nonpoint sources. The percent retirement ratio may be adjusted over time.
>
> **Uncertainty Ratios:** Uncertainty ratios are intended to account for variation in the expected reliability and efficiency of the source or type of reduction being applied toward credit for another. They are calibrated to create a margin of safety or otherwise attempt to ensure that the credited practice provides a minimum level or reductions, even if actual reduction efficiencies and units removed are on the low end of an expected range. In some instances uncertainty ratios will not be employed because they are already accounted for in quantification methods. Trades involving nonpoint sources may use uncertainty ratios of greater than 1:1.

Wasteload Allocation (WLA): The portion of receiving water's loading capacity that is allocated to one of its existing or future point sources of pollution. WLAs implemented in discharge permits constitute a type of water quality-based effluent limitation (40 CFR 130.2(h)).

Table of Acronyms

BMP	best management practice
BNR	biological nutrient removal
BRF	Bay Restoration Fund
CBNTT	Chesapeake Bay Nutrient Trading/Tracking Tool
CBP	Chesapeake Bay Program
CBWM	Chesapeake Bay Watershed Model
CWA	Clean Water Act
ENR	enhanced nutrient removal
EOS	edge of stream
EPA	U.S. Environmental Protection Agency
GPD	gallons per day
LA	load allocation
MDA	Maryland Department of Agriculture
MDE	Maryland Department of Environment
MDP	Maryland Department of Planning
MGD	million gallons per day
MNTT	Maryland Nutrient Tracking Tool
MS4	municipal separate storm sewer system
NRCS	Natural Resources Conservation Service
NPDES	National Pollutant Discharge Elimination Systems
OSDS	onsite sewage disposal system
POTW	publicly-owned treatment works
SSA	Science Services Administration
TBEL	technology based effluent limitations
TM	technical memorandum
TMDL	total maximum daily load
TN	total nitrogen
TP	total phosphorus
TSS	total suspended solids
USDA	U.S. Department of Agriculture
WMA	Water Management Administration
WIP	watershed implementation plan
WLA	wasteload allocation
WQBEL	water quality based effluent limitations
WWTPs	wastewater treatment plants