



**MARYLAND POLICY  
FOR NUTRIENT CAP MANAGEMENT  
AND TRADING IN MARYLAND'S  
CHESAPEAKE BAY WATERSHED**



**Maryland Department of the Environment  
Water Management Administration**

**April 17, 2008**

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**INTRODUCTION**

Maryland's water quality standards for the Chesapeake Bay require significant reductions in nutrient loadings. The State is developing and implementing Maryland's Chesapeake Bay Tributary Strategy to achieve reductions from point sources and nonpoint sources necessary to meet Maryland's allocation under the Bay Program (see [http://www.dnr.state.md.us/bay/tribstrat/implementation\\_plan.html](http://www.dnr.state.md.us/bay/tribstrat/implementation_plan.html)). For the point sources, the Tributary Strategy identifies nutrient load caps based upon Maryland's Enhanced Nutrient Removal (ENR) Strategy. All states in the Chesapeake Bay Watershed are now required to issue National Pollutant Discharge Elimination System (NPDES) permits with limits for nutrients based on their state's Tributary Strategy nutrient load caps. In Maryland, this means that all significant point source dischargers will have Tributary Strategy loading cap-based nutrient limits in their permits. To maintain the required caps, nutrient loadings from new or expanding dischargers will have to be offset by equivalent loads.

This policy will be issued in two phases. This phase, Phase I of the policy, establishes an approach for trading between point sources and trading involving the removal of onsite sewage disposal systems (OSDSs). The Phase I Policy also establishes definitions, key principles, and fundamentals that are applicable to trading programs involving both point sources and nonpoint sources. This trading policy is necessary to maintain nutrient load caps for point sources while accommodating the need for growth. The policy does not preclude the development of specific trading policies for pollutants other than nutrients. The next phase, Phase II of the policy, will address point source to nonpoint trading/offsets.

**Purpose**

This document is intended to apply to and support watershed stakeholders interested in participating in nutrient trading opportunities. The key goals and purposes of the policy are as follows:

- To offset new or increased discharges in order to maintain levels of water quality that support all designated uses.
- To establish economic incentives for reductions from all sources within a watershed.
- To achieve greater environmental benefits than through the existing regulatory programs. For example, Maryland Department of the Environment (MDE) supports the creation of trading credits in ways that achieve ancillary environmental benefits beyond the required reductions in specific pollutant loads.

In addition to the above, there may be some benefits in common with carbon trading and practices that reduce greenhouse emissions.

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## Effect of Policy

The policies and procedures outlined in this document 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 establishes the framework for MDE to exercise its administrative discretion in the future. Neither the load allocations nor the credits generated or purchased under this policy are a property right. Load allocations and trading baselines will be implemented through NPDES discharge permits.

## **1. BACKGROUND**

Maryland, Virginia, Pennsylvania, Delaware, West Virginia, New York, the District of Columbia, the U.S. Environmental Protection Agency (EPA), and the Chesapeake Bay Commission (i.e., the Chesapeake Bay Signatories) signed the historic Chesapeake 2000 Agreement to restore the water quality in the Chesapeake Bay and its tributaries. The Agreement set annual nutrient loading goals of 175 million pounds of nitrogen and 12.8 million pounds of phosphorous, of which Maryland's portion is 37.25 million pounds for nitrogen and 2.92 million pounds for phosphorous. These goals have been incorporated into Maryland's Tributary Strategy and are being implemented as loading caps. (Appendix A, lists the nutrient load caps specified for each of Maryland's significant facilities organized by Chesapeake Bay tributary basin.)

Once Maryland and the other states achieve the necessary reductions, they must maintain that level in order to sustain improved water quality in the Bay.

To achieve Maryland's water quality standards for the Chesapeake Bay, the State of Maryland has developed a strategy for point sources as part of the Tributary Strategy Statewide Implementation Plan (a.k.a., "Point Source Strategy"). The Point Source Strategy is a two-part plan to (1) upgrade significant wastewater treatment plants (WWTPs) to state of the art ENR technology to meet permit loading limits based on concentrations of 4.0 mg/l or less total nitrogen and 0.3 mg/l or less total phosphorus and (2) maintain the nutrient load caps for all point sources. New dischargers and existing dischargers of any size that want to grow beyond their Tributary Strategy nutrient loading caps can do so through several mechanisms: optimizing treatment options; acquiring equivalent point source discharge credits from other dischargers; upgrading minor facilities to Biological Nutrient Removal (BNR) or ENR levels; retiring an existing minor WWTP after connecting its flow to BNR or ENR facility; retiring existing OSDs by connecting them to ENR facility or other facility which will provide a net nutrient reduction; land application of wastewater with pre-treatment and nutrient management controls; and acquiring nonpoint source discharge credits. Rules governing the creation and exchange of credits for nonpoint sources will be developed in Phase II of Maryland's cap management approach.

Maryland provides up to 100% grant funding for the eligible portion of ENR upgrade of 66 significant WWTPs that discharge into the Chesapeake Bay via the Bay Restoration Fund (BRF). The BRF was established by Senate Bill 320 (2004). It is a special, continuing, non-lapsing

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fund, which may not revert or be transferred to the General Fund of the State. In recognition of the BRF, and in order to achieve early nutrient load reductions from point sources, trading in Maryland will not be available for these facilities in lieu of ENR upgrades.

Population and economic growth pressures in Maryland and other Bay States may, without appropriate policy implementation, lead to increases in nutrient loads due to increases in sewage flows and nonpoint source flows in urban areas. Intensification of animal agriculture also contributes to the increase in nutrient loads. Maryland's Point Source Strategy calls for trading/offsets and load reallocation policy as a creative and innovative approach to address growth and maintain nutrient load caps for point sources.

U.S. EPA also supports trading and states that "market-based approaches such as water quality trading provides greater flexibility and have potential to achieve water quality and environmental benefits greater than would otherwise be achieved under more traditional regulatory approaches." Nationally, EPA also supports trading to achieve early reductions and progress towards water quality standards and to reduce the cost of implementing Total Maximum Daily Loads (TMDLs) for impaired waters. Specific to the Chesapeake Bay Program, U.S. EPA Region III has also publicly supported point source nutrient trading programs in both Pennsylvania and Virginia.

MDE has used a public process to develop statewide implementation criteria for point source to point source trading and generating credits by retiring septic systems. To obtain broad public input, a preliminary discussion draft "Approach for Managing Nutrient Caps for Point Sources in Maryland's Chesapeake Bay Watershed" was presented to stakeholders on April 17, 2006. Following the initial meeting, MDE conducted "listening sessions" from July 17, 2006 through March 7, 2007 with individual stakeholder groups upon request. Subsequent comments were also received through October 11, 2007. The following stakeholders participated in discussions leading to the establishment of this policy: 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 the Maryland Departments of Agriculture (MDA), Natural Resources (DNR) and Planning (MDP).

This document reflects the Department's best efforts to address the many diverse comments, views and suggestions received during public outreach. It sets forth Phase I of the Policy for Maryland's Nutrient Cap Management and Trading/Offset Program for Point Sources. The Policy allows MDE to properly manage the Chesapeake Bay nutrient loading caps for point sources and to offset nutrient loadings from new or expanding dischargers by equivalent nutrient loads. It also allows offsetting nutrient load increases by transferring flow from a residential OSDS to an ENR WWTP or other facility that will provide a net nutrient reduction. Subsequent guidance/regulation will be developed to further define this program and address watershed-specific strategies as trading is implemented statewide.

Initially, MDE will maintain databases of credits generated and traded under this policy. Parties interested in investigating trading opportunities should contact MDE's Water Management Administration for additional guidance and assistance. Trading will be implemented through the NPDES permit program. Trades will be reflected in a facility's permit when MDE transfers

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water quality credits from an eligible seller to an eligible buyer by an agreement between them. Eligible buyers are primarily public and private WWTPs who hold or must acquire a state issued NPDES permit and have their permit modified to reflect their participation in the trading program.

A Point Source to Nonpoint Source Trading/Offset Program for agricultural sectors (“Phase II Policy”) is under development. An initiative is being undertaken to develop this second Phase of the policy with significant involvement of MDA. The goals and issues to be addressed by this initiative are listed in Section 5.4.5 below.

Effective Date: April 17, 2008

Authority

- 33 U.S.C.A. § 1251 et seq.; MD. Code Ann., Envir. § 4-101, et seq.;
- Clean Water Act’s National Pollution Discharge Elimination System (NPDES) using EPA’s implementing regulations as delegated from EPA to MDE;
- U.S. EPA’s Permit Writers Toolkit for Trading, August 2007;
- U.S. EPA’s Final Water Quality Trading Policy, January 13, 2003;
- Chesapeake Bay Program Nutrient Trading Fundamental Principles and Guidance (U.S. EPA, 2001)

## **2. DEFINITIONS**

**Baseline:** The pollutant control requirements that apply to sellers as specified in this policy. Sellers must first achieve their applicable baselines before they can enter the trading market and sell credits. Buyers can purchase credits to achieve their applicable tributary strategy caps once they have met their minimum control levels (defined below). Permittees regulated based on a local watershed TMDL after the effective date of this policy, will have two separate baselines whose applicability depends on the geographical area of a trading partner. A permittee’s baseline for generating credits to trade outside of that permittee’s local TMDL watershed will be based on the tributary strategy annual loading allocation. A permittee’s baseline for generating credits to trade within that permittee’s local TMDL watershed will be based on a Wasteload Allocation (WLA) consistent with the local TMDL. This approach is consistent with the fundamental trading principal that local water quality standards shall be protected.

**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



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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.

**Credit or Pollutant Reduction Credit:** A measured or estimated unit of pollutant reduction per unit of time adjusted to account for applicable trading ratios. A seller generates excess load reductions by controlling its discharge beyond what is needed to meet its baseline through controlling its flow and/or its discharge concentrations. A buyer compensates a seller for creating the excess load reductions that are then converted into credits by using trading ratios. Where appropriate, the buyer can use the credits to meet a regulatory obligation. Credits are expressed as pounds per year of nitrogen or phosphorus that is delivered to the Chesapeake Bay. End-of pipe loads are multiplied by the Chesapeake Bay watershed model delivery factor (up to 1.00) to calculate delivered loads. Credits are valid for one calendar year. Credits will need to be measured, verified and accounted for according to that time period. Credits cannot be banked for future years. Finally, credits must be applied in the year they are generated.

**Effluent Limitation Guidelines and Standards (ELGs):** A regulation published by EPA under section 304(b) of the Clean Water Act 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 total nitrogen and 0.3 milligrams per liter total phosphorus, 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 accordance with Maryland's Tributary Strategy.

**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 total nitrogen or 0.3 mg/l total phosphorus and converted to units of pounds per year (lbs/yr).

**Major Permit Modification:** A permit revision requiring a formal public participation process, including public notice of application received and opportunity for informational meetings and a public hearings.

**Minimum Control Level:** The pollutant controls, including Technology Based Effluent Limitations (TBELs), that a point source buyer must implement before using credits or offsets to meet the facility's tributary strategy cap. For significant POTWs and other significant sewage treatment plants, the minimum control level is implementation of ENR treatment. In addition, for BRF-funded ENR facilities, the minimum control level includes the concentration-based annual loading limitation in their discharge permits (also referred to as a floating cap because it is based on each current year's discharge volume). New discharges of 0.1 mgd or more shall be

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required to implement ENR level treatment, and new facilities discharging less than 0.1 mgd will require secondary treatment as a minimum.

**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.

**New Point Source:** A point source with no waste load allocation in the Tributary Strategy.

**Nonpoint Source:** A source of pollution that is 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, mining, construction, dams, channels, land disposal, saltwater intrusion, and city streets.

**Nonpoint Source Discharge Credit:** Credits generated by nonpoint sources through a variety of possible mechanisms. Baseline nonpoint source reduction requirements, defined in Phase II of this trading policy, must be met before offset credits can be generated. As with point source discharge credits, nonpoint source discharge credits are based on delivered loads, hence Chesapeake Bay watershed model delivery factors are applied to edge-of-field loads.

**Nutrient Trading:** A market-based approach to achieving water quality standards in which a point source purchases pollutant reduction credits from another point source or a nonpoint source in the applicable trading region that are then used to meet the point source's pollutant discharge obligations. To be creditable to the point source purchaser, the credits must reflect an actual, pollutant load differential below the credit seller's baseline. Under certain circumstances, a point source buyer may have to purchase more than one pound of pollutant reduction to equal a pound discharged at its outfall.

**Nutrient Reduction:** The difference in nutrient discharges to surface waters achieved by activities such as best management practices or technical upgrades, compared to the applicable baseline after meeting eligibility requirements.

**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.

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

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**Registry:** A system utilized to track and record the generation and exchange of credits.

**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.

**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 (CFR) Part 133) or state treatment standards. TBELs for non-POTWs are derived from national ELGs, state treatment standards, or on a case-by-case basis from the best professional judgment of the permit writer.

**Third Party:** Any entity that is not a buyer or seller in the trade. A third party can be a state agency, conservation district, private entity, or other organization or person. Third parties could assist in facilitating credit exchanges and 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 (accounting for seasonal variations and a margin of safety), including an allocation of pollutant loadings to point sources (WLAs) and nonpoint sources (load allocations (LAs)).

**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 point, as well as, 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 Chesapeake Bay Watershed Model.

**Retirement Ratios:** Retirement Ratios are applied to implement policy-driven or programmatic decisions to require that buyers or sellers donate part of all credit purchases or sales to the state or some other entity that will not apply the credits to offset loadings above its cap. The Department will seek a five (5) percent retirement ratio for all point source to point source trades. 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

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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 of 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)).

### **3. KEY PRINCIPLES**

#### **3.1 All new and expanded point source nutrient loads must be fully offset**

To participate in trading, new point source dischargers with no allocation in the Tributary Strategy or point source dischargers requesting an increase in load allocation must fully offset any increased point source loading.

#### **3.2 Consistency with the County Water and Sewerage Plan**

All point source trades must be consistent with the approved County Water and Sewerage Plan. In addition, 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.

#### **3.3 Trading will not be available in lieu of required ENR upgrades**

All significant WWTPs, including BRF-funded POTWs, federal facilities, and privately owned sewage treatment plants that have been identified by MDE (see [http://www.dnr.state.md.us/bay/tribstrat/implementation\\_plan.html](http://www.dnr.state.md.us/bay/tribstrat/implementation_plan.html)) are required to upgrade to ENR, and trading will not be available as a substitute for the upgrades. However, the use of offsets by a discharger prior to its completion of a scheduled and permitted upgrade to ENR will be considered by MDE on a case by case basis as part of the NPDES discharge permitting process (including public participation).

#### **3.4 Point source trades will be implemented and enforced via NPDES permits**

The permit limits will serve as the baseline for generating credits for use in trading. The permits will also provide the vehicle for enforcement of the trade condition. The use of the discharge permit program will ensure that credits are accountable, reliable, and enforceable. The Department will note in the public notice when any conditions allowing trading have been included in the draft permit. These conditions will be subject to the normal comment process and period (usually 30 days), along with all other conditions of the permit.

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### 3.5 Consistency with federal and State environmental requirements

Trading and usage of credits must be consistent with the federal Clean Water Act, Maryland's Environment Article, Code of Maryland Regulations (COMAR), and any other applicable requirements. Trading participants must be in compliance with all local, state and federal environmental laws, regulations and programs.

### 3.6 Compliance with TMDLs and Water Quality Standards

All nutrient trades or offsets must comply with any local TMDL-based allocations, and must not cause or contribute to any local violations of water quality standards.

### 3.7 Protecting local water quality is mandatory

Maryland's approach of implementing trading through permits will ensure that trades do not cause or contribute to local water quality impairments. Permits will contain conditions that achieve all State water quality standards for the local receiving waters and for the Chesapeake Bay. The discharge permits and the conditions therein are also subject to a well-defined public participation process.

### 3.8 Public Outreach/Stakeholder Participation

Trading will be implemented in a way that provides stakeholders and the general public with access to information related to the trading program including the trading policy and guidelines, appendixes, credit generation opportunities, trades effected, and other relevant information via the department's website, press releases and public outreach opportunities.

### 3.9 Water Quality Benefits

Trading has the potential to achieve cost effective water quality and environmental benefits. To ensure that this potential is achieved and that trades do not adversely impact water quality, appropriate data will be collected and periodic reviews conducted.

### 3.10 What May be Traded

MDE supports the concept of trading and through this Policy seeks to specifically facilitate the trading of nutrient (total phosphorous and total nitrogen) discharge credits. Such trades should involve comparable credits (e.g. nitrogen traded for nitrogen). The Department may in the future consider authorization of 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 this Trading Policy.

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

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### 3.11 Unit of Trade

The unit of trade, credit, should be expressed as mass per unit time (e.g. pounds per year) and be consistent with the time periods that are used to determine compliance with NPDES permit limitations or other applicable requirements. Credits will be valid for one year for trading 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. Credits cannot be banked for future years. For example, if a BMP generates 100 credits each year and has a life span of five years, 500 credits cannot be applied to a permit in year five. Credits may only be applied (used) in the year they are generated.

### 3.12 Point Source Baseline and Trading Eligibility

Maryland's ENR/Tributary Strategy WLAs and caps serve as a baseline for point sources. The baseline cap allocations do not become eligible for trading by a permittee until they are adopted in permits through the public process. The baseline for significant dischargers to become eligible to generate credits for trading is an ENR treatment system in operation and associated permit limits in effect. Minor dischargers may generate credits when the baseline loads of 6,100 lbs/yr of nitrogen and 457 lbs/yr of phosphorus or less are assigned as a permit limit. A facility trading away credits based on a determination that it has 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 in using methodology consistent with MDE's Wastewater Capacity Management Plan Guidance.)

## **4. FUNDAMENTALS**

### 4.1 General

The Department will require a 5% 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 the Department may be considered, subject to applicable laws and input from a public participation process.

### 4.2 Credit Origination/Generation/Funding Sources

Water quality credits may be generated from point source discharges funded through a variety of sources such as the State Revolving Fund, local funds, private funds or grant dollars. The cost of credits is determined by the market. Part II of the policy will address point to nonpoint trades involving nonpoint source practices, including those that have been financed with State or federal funds. Where a nonpoint source practice has been cost-shared by State or federal funds, some or all of the resulting reductions from the practice or project will not be eligible as credits for trading, the extent of which will be established in Part II of the policy.

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#### 4.3 Who May Participate in Trading

- Point sources
- Nonpoint sources
- Third parties
- Any combination of the above

Point sources, nonpoint sources or third parties can participate in trading to facilitate compliance with regulatory requirements subject to the criteria specified in this policy. In addition, any entity may create, purchase, retire or otherwise use credits for the purpose of securing long-term improvements in water quality, subject to applicable laws. The State reserves its authority to deny any proposed trade, including any trade for the purpose of retiring point source credits, if the State determines such trade to be in conflict with or impede implementation of smart growth policies.

#### 4.4 Credit Generation Options

Credit Generation options include, but are not limited to:

- Upgrading an existing minor to BNR or ENR;
- Retiring an existing minor WWTP after connecting its flow to BNR or ENR facility;
- Retiring an existing (as of effective date of this policy) OSDS by connecting to an ENR facility;
- Land application of wastewater with pre-treatment and nutrient management controls;  
or
- Implementing nonpoint source practices.

ENR facilities may generate point sources discharge credits by:

- Optimizing treatment operation;
- Maintaining flow at less than the design flow basis of its nutrient wasteload allocation (WLA).

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.

#### 4.5 Where Trading May Occur (Trading Regions)

Geographical boundaries for trading will be based on three large watersheds or "trading regions." Pollutant reductions for trading purposes will be calculated within these defined regions:

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

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In order to ensure equivalent water quality results, delivery factors, as determined by the Department, will be applied to account for possible differences in delivered loads between the trading partners due to location.

On a case-by-case basis, as determined during the NPDES discharge permit process, existing local water quality impairments may require trading on a smaller scale to comply with local TMDL requirements or to prevent further degradation.

Finally, nothing in this Policy precludes the possibility of interstate trading within the three major river basins.

#### 4.6 Trading Outside Priority Funding Areas (PFA)

Credits generated by point sources that received BRF grant funding may be approved by the Department for trading to treatment plants outside PFAs only if the BRF grant recipient agrees to pay back to the State the proportionate share of the BRF grant amount used to produce the credit (i.e. a pro-rated amount based on pounds of nutrient removed).

#### 4.7 Starting Date

BMPs or other potential credit-generating activities occurring after the effective date of this policy may be submitted for review to determine credit eligibility. BMPs or other activities that were completed prior to the effective date of this policy may also be submitted for review and determination of credit eligibility if continuing maintenance of the activity shows it is meeting and exceeding the baseline and eligibility requirements on a continuing basis.

#### 4.8 Calculation of Point Source Credits

Appendix B sets forth an example of how the number of nitrogen or phosphorus discharge credits available for trading are calculated.

#### 4.9 Duration of Credits/Offsets

Because one purpose of this Policy is to accommodate new or expanded discharges that have no wasteload allocation, credits acquired for this purpose 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 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.



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#### 4.10 Trading with Nonpoint Sources Involving Significant Land Use Changes

When a significant land use change occurs, a new point source or an existing point source seeking to increase its discharge shall be required to offset associated new nonpoint source loads (in addition to requirements to offset point source loadings) if the point source acquires offsets from a nonpoint source. The increased nonpoint source load as a result of the land use change may be accounted for either through conditions of the trade or through other requirements. For example, a new point source discharger providing treatment of domestic wastewater will have as its service area a new development to be located on previously undeveloped lands. The treatment plant must fully offset its nutrient loadings. If the treatment plant acquires an offset through reductions in nonpoint source loadings from another location within the allowed trading region, then the offset calculation must also account for any increased nonpoint source loadings resulting from the change in land use within the service area of the treatment plant.

### **5. POINT SOURCE TO POINT SOURCE TRADING (AND OSDS)**

In some other states in the Chesapeake Bay Watershed the trading of nutrient allocations plays a role in meeting the nutrient caps for those states. In Maryland, due to the ENR Strategy, the Bay Restoration Fund Act and the recognized need to achieve reductions in point source discharges as soon as possible, ENR technology will be the primary method for existing significant point sources to achieve their Tributary Strategy load allocation caps. Trading/offsets may then be used to *maintain* those caps by providing opportunities for growth, and secondarily as an option for providing an additional margin of safety to meet permit requirements. New point source dischargers with no allocation in the Tributary Strategy or existing point source dischargers requesting to increase the discharge allowed under their Tributary Strategy load allocation must fully offset any increased point source loading.

#### 5.1 Nutrient Load Caps/Goals

##### *5.1.1 Significant Point Sources Nutrient Load Caps*

As specified in the Point Source Tributary Strategy, existing significant municipal WWTPs in Maryland are those with the design capacity of 500,000 gallons per day or greater, the combined flow of which accounts for more than 95 percent of the total sewage flow generated in Maryland. The applicable “design capacity” for significant facilities is that which meets the following two conditions: (1) a discharge permit was issued based on the plant capacity, or a letter was issued by MDE to the jurisdiction with design effluent limits based on planned capacity as of April 30, 2003; and (2) planned capacity was either consistent with the MDE-approved County Water and Sewerage Plan as of April 30, 2003, or shown in the locally-adopted Water and Sewerage Plan Update or Amendment to the County Water and Sewerage Plan, which were under review by MDE as of April 30, 2003.

Nutrient load caps apply to significant point source discharges of nutrients within the Chesapeake Bay Watershed. Annual nutrient load caps are based on “design capacity” as defined above and an annual average concentration of 4.0 mg/l total nitrogen and 0.3 mg/l total phosphorus and the design capacity of that plant. Significant facilities with tighter limits due to local water quality requirements as of April 30, 2003 were assigned local limits. As a result, the

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phosphorus caps assigned for four plants were based on permit TP limits of 0.18 mg/l at Blue Plains, Piscataway and Mattawoman and TP of 0.2 mg/l at Back River, that were already in effect as of April 2003.

#### *5.1.2 Minor Point Sources Nutrient Load Goals*

No expanding minor facility (i.e., any minor facility requesting an increase in capacity) will be allocated more than 6,100 lbs/yr in nitrogen and 457 lbs/yr in phosphorus (which is the load discharged by a 0.5 million gallons per day (mgd) WWTP operating at 4 mg/l total nitrogen and 0.3 mg/l total phosphorus) or its current nutrient load cap, whichever is less. Existing minor municipal WWTPs in Maryland are those with the design capacity of less than 500,000 gallons per day. Annual nutrient load goals for minors are defined in the Point Source Tributary Strategy as loads based on design capacity or the projected flow for year 2020<sup>1</sup>, whichever is less, and a concentration of 18 mg/l total nitrogen and 3 mg/l total phosphorus.

#### *5.1.3 Industrial Point Sources Nutrient Load Goals*

Annual load goals for significant industrial point sources are based on a combination of (i) historical performance levels; (ii) the amount of loading reductions already achieved since the initial baselines established in 1985 and (iii) establishment on a case by case basis of additional potential loading reductions. Industrial facilities with a minimum total nitrogen discharge of 75 pounds per day or minimum total phosphorus of 10 pounds per day will have their annual load goals included as limits in their discharge permits.

#### *5.1.4 New or Expanding Point Sources*

Maryland's Chesapeake Bay Tributary Strategy does not provide allocations for new or expanding significant or minor point sources. All point source loadings associated with new or expanded facilities must be offset. In addition, a new discharge of 0.1 mgd or more shall be required to implement ENR level treatment, and new facilities discharging less than 0.1 mgd will require secondary treatment as a minimum. Local water quality conditions may require more stringent controls on a case-by-case basis.

### 5.2 Eligibility Requirements for Generating Discharge Credits and Trading

Point source trades will be implemented and enforced via NPDES permits and associated compliance reporting. *The nutrient cap-based permit limits for significant point sources, minor point sources and industrial point sources will serve as the baseline for generating point source discharge credits for use in trading.* Existing minor dischargers may also be assigned permit loading limits (based on the tributary strategy caps) upon expansion or treatment upgrades, which would then serve as a baseline for generating credits for those facilities. Some allocations may require review and adjustment by the State during the permit renewal process, such as when an industrial facility proposes to change to a different industrial category or convert to a sewage

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<sup>1</sup> The 2020 projected flows were based on the "Historical and Projected Population for Maryland's Jurisdictions" provided by the Maryland Department of Planning as of 03.04.2003

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treatment facility. A facility trading away credits, based on a determination that it has excess capacity, must demonstrate that the trade is consistent with the applicable Water and Sewerage Plan and evaluate the impact of the trade on current and projected sewer allocations, using methodology consistent with MDE's Wastewater Capacity Management Plan Guidance. See <http://www.mde.state.md.us/assets/document/water/WastewaterCapacityMgmtGuidance.pdf> for information.

#### *5.2.1 Baseline Requirements for Significant Point Sources*

All existing significant POTW dischargers are required to upgrade to ENR and trading will not be available in lieu of treatment upgrades, but trading may be allowed to acquire credits needed to accommodate a short-term increase in current loadings prior to the completion of a scheduled and NPDES permitted upgrade of the POTW to ENR treatment. Significant dischargers are eligible to generate credits for trading when the ENR treatment system is in operation and the baseline caps (i.e., the Tributary Strategy allocations), adopted in permits as permit limits through the public process, are in effect. The nutrient loading caps for existing significant nutrient dischargers will be implemented through individual State/federal discharge permit limits as each significant facility's permit comes up for renewal. A municipal wastewater authority may, however, request to redirect flows among its significant 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 significant facilities to be upgraded to ENR. However, 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.

#### *5.2.2 Baseline Requirements for Minor Point Sources*

Minor dischargers that want an option to generate credits for trading will be assigned baseline loads equal to the Tributary Strategy loading allocation for the facility or 6,100 lbs/yr total nitrogen load cap and 457 lbs/yr total phosphorus load cap, whichever is less (see Section 5.1.2 "Minor Point Sources Nutrient Load Goals"). The loads will be adopted in permits as permit limits through the NPDES public process. Tributary Strategy allocated loads in excess of 6,100 lbs/yr of total nitrogen and 457 lbs/yr of total phosphorus will revert back to the State and be reallocated by MDE on case-by-case basis (see Section 5.4 "Options for Obtaining Nutrient Credits"). For existing minors not participating in the trading program, loading caps will be assigned as permit goals instead of limits unless their permit involves an increase in design capacity to  $\geq 0.10$  mgd.

#### *5.2.3 Industrial Point Sources*

For significant industrial point sources, permit limits implementing the nutrient loading caps under the Tributary Strategy will serve as the baseline for generating credits for trading.

#### *5.2.4 New Point Sources*

New discharges of 0.1 mgd or more shall be required to implement ENR level treatment, and

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new discharges less than 0.1 mgd will require secondary treatment as a minimum. Local water quality conditions may require more stringent controls on a case-by-case basis.

### 5.3 Duration of Credits/Offsets

A new or expanding municipal discharger submitting a trading proposal must demonstrate that it has secured credits or offsets for at least the next two consecutive permit cycles (i.e., 10 years). In addition, the facility must submit a plan showing how it intends to acquire the necessary credits for at least an additional 10 years. At each subsequent NPDES permit renewal, the facility must demonstrate the securing of credits for the next two permit cycles (10-year period), and submit a plan for acquiring them for the 10 years beyond the two permit cycles (i.e. a total 20-year planning horizon).

Industrial facilities must secure credits or offsets 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 the Department, may be required. They may include such things as backup plans and alternative options to address failures by nonpoint sources to provide the contracted offset credits.

#### *5.3.1 Significant Point Sources*

The available long-term trading credits shall be based on the existing 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. In addition to the above, the available long-term credit shall account for the load allocations approved for new development. (A sample calculation is shown in Appendix B.) This long-term reduction in nutrient allocation will then be reflected in the discharge permit as a revised nutrient loading limitation.

#### *5.3.2 Minor Point Sources*

All existing minor wastewater treatment plants may generate credits for long-term trading by upgrading to BNR or ENR. The available long-term trading credits shall be based on the Tributary Strategy loading allocation for the facility or 6,100 lbs/yr total nitrogen loading cap and 457 lbs/yr total phosphorus loading cap, whichever is less, minus the nutrient loading calculated at the remaining flow capacity of the treatment system and the projected achievable nutrient treatment performance level. In addition to the above, the available long-term credit shall be evaluated for potential impacts on current and projected sewer capacity allocations using methodology consistent with MDE's Wastewater Capacity Management Plan Guidance.

#### *5.3.3 Industrial Point Sources*

The same credit generation guidelines described above, aside from the requirement to upgrade to BNR or ENR, apply to industrial point sources. Technology-based upgrade requirements will be applied on a case-by-case basis or other appropriate approaches that result in actual reductions in

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discharges, including, but not limited to, implementation of pollution prevention and recycling.

#### 5.4 Options for Obtaining Nutrient Credits

Load credits/offsets may be obtained 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. Credits may only be applied in the year they are generated, (See Sections 3.4 and 3.11 for details.)

##### *5.4.1 Upgrade the treatment system of an existing minor facility to BNR or ENR*

Where a new facility or an expanding facility obtains consent of the minor facility to upgrade the existing facility to BNR or ENR, MDE will commit to allocating the appropriate loading to that discharger as follows. The participating minor facility will be given a permit limit effective upon completion of the upgrade corresponding to a nutrient loading allocation of up to 6,100 lbs/yr total nitrogen and 457 lbs/yr total phosphorus based on its design capacity and resulting loading at 8 mg/l total nitrogen and 2 mg/l total phosphorus for BNR and 4 mg/l total nitrogen and 0.3 mg/l total phosphorus for ENR. As a result, the Department will then allocate to the new discharger via a permit limit 95 percent of the difference between the previous allocation and the new reduced allocation of the upgraded minor, retiring for water quality benefit the remaining 5 percent. In addition, the minor facility may also choose to trade some of its resulting permit allocation 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.]

##### *5.4.2 Retire an existing minor sewage treatment plant after connecting its flow to a BNR or ENR facility*

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

##### *5.4.3 Obtain eligible long-term credits from existing significant ENR facilities*

The Department would implement this trade through a permit modification<sup>2</sup> of the ENR facility's limit to reflect the corresponding reduction in its allocation.

##### *5.4.4 Retire existing residential OSDS by connecting to an ENR facility*

The Department may provide a nitrogen loading allocation to an ENR facility (or a facility with plans to upgrade to ENR) based upon proximity of the retired residential OSDSs to surface

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<sup>2</sup> 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.

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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 – 12.2 lbs/yr total nitrogen;
- B. Within 1,000 feet of any perennial surface water - 7.5 lbs/yr total nitrogen;
- C. All other – 4.6 lbs/yr total nitrogen

Credits for connecting non-residential systems will be established on a case-by-case basis.

These credits are based on assumptions used by the Chesapeake Bay Program for nitrogen and phosphorus. MDE has adjusted the Bay Program's nitrogen delivery rates based on distance to surface water: 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). See Appendix B.1, "The OSDS Hookup Credit Assumptions" for more details.

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

#### *5.4.5 Offsets from Agricultural Nonpoint Sources*

Maryland recognizes the need and the advantages of using nonpoint source reductions to offset point source increases. The State is in the process of developing an efficient, comprehensive nonpoint source policy framework. During development of the Phase II Policy the Department may consider on a case-by-case basis small scale and/or short-term proposals for nonpoint source credits, providing such proposals are specifically identified during the public comment period for affected NPDES permits. Such decisions will be specific to the affected NPDES permit and are not intended as precedent for the final statewide policy. Any resulting nonpoint source discharge credits must be consistent with the key principles established in the Phase I Policy, in particular the protection of local water quality.

The Phase II process will be coordinated by MDE, with significant collaboration by MDA. The Point to Nonpoint Trading/Offset Program initiative will consider the following:

- Rules for trades among point and agricultural nonpoint sources;
- Technical rules to compute load reductions for various practices, trading ratios;
- Administrative rules and procedures;
- Fiscal rules;
- Rules for qualifying and evaluating innovative BMPs;
- Rules for documenting, tracking and monitoring BMPs used in trades;
- Baseline and eligibility requirements for trading;
- Banking, including current programs and potential local and private programs;
- Evaluation of opportunities for multiple ecological services to provide financial

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- incentives for private landowner participation;
- Establishing and management of a registry of credits and trades.

The Phase II Policy process will involve a stakeholder input process and all interested stakeholders will be invited to comment on the policy. The MDA will assist with a specific initiative directed to the agricultural community to address issues of interest to farmers.

#### *5.4.6 Offsets from Other Innovative BMPs*

This policy does not preclude other practices from being used to generate offsets. Established technologies such as wetlands restoration or creation may potentially generate credits and the development of innovative and emerging technologies such as water reuse, oyster banking; algal farming and others are encouraged to be developed for future consideration.

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

Finally, the Department is interested in third-party initiatives to create nutrient credits/offsets to be made available to new or expanding point sources.

### 5.5 Incorporating Trades in NPDES Permits

#### *5.5.1 Permitting*

Point source trades will be implemented and enforced through discharge permits. This approach will ensure that trades do not cause or contribute to local water quality impairments. 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.

#### *5.5.2 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.<sup>3</sup> 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

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<sup>3</sup> 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.

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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 also be issued to multiple owners in a watershed who elect 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 Department approval for permit modifications for nutrient trades between point sources under Phase I of this policy. [The Phase II application and approval requirements for point source-nonpoint source trades will be developed under Phase II of this policy and are likely to differ from the Phase I requirements].

### 6.1 Identifying Trading Parties

Municipal or industrial facilities seeking to acquire or sell discharge credits are responsible for identifying trading parties. The pool of candidates consists of Maryland's significant major wastewater treatment plants including POTWs, federal facilities, and industrial dischargers as well as minor municipal and industrial wastewater treatment facilities within the Chesapeake Bay watershed. Trading parties can be identified by contacting MDE, individual facilities or third-party stakeholder groups such as MAMWA.

### 6.2 Application Process and Documentation Requirements

Facilities planning to enter into a trading agreement shall jointly submit an application for approval of the trade and for modification of the NPDES permits of the trading partners to the Department. The application shall be composed of three parts: (1) specific details of the trade; (2) credit buyer documentation; and (3) credit seller documentation. Final application format, standardized forms and the process for applications and documenting trades will be developed by the Department and stakeholders.

#### *6.2.1 The Trading Application – Specific Details of the Trade*

The trading application shall provide specific information about the proposed trading arrangement. This information shall include the following:

- The time period for the trading arrangement;
- The number of discharge credits to be exchanged each year during this period;
- How the number of required credits to be exchanged was determined;
- Source of credits; and
- The general contractual arrangements.

The trading parties may keep some contract terms confidential and this policy does not



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necessarily require the disclosure of all contract terms. The Department will work with stakeholders to determine the minimum requirements for disclosure of contract terms that would allow for adequate review of the trade proposal.

#### *6.2.2 Credit User Documentation*

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

- The need for the trade, including the wasteload allocation 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 eligibility of the facility to trade;
- 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.

#### *6.2.3 Credit Supplier Documentation*

The facility providing discharge credits shall provide information on the following matters:

- 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 and,
- 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 eligibility of the facility to trade;
- 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.

MDE will review the application to trade and evaluate it based on the requirements described in this policy. 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 nutrient reduction-trading program, including responsibility for policy decisions on issues such as eligibility, credit certification, verification, compliance monitoring and enforcement. MDE may elect to delegate

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some activities to third parties, such as credit verification or third party audits of transactions. Specific details of nonpoint source credit verification will be addressed in Phase II.

Implementing this policy will require staff resources. It is MDE's preliminary intention to work with other state agencies to get a trading program established using available resources. As the program evolves, a fee-based approach will be required. For example, fees could be charged for Agency review and certification of credit proposals as well as if special oversight is required of particular credit generation activities.

## **8. STAKEHOLDER INVOLVEMENT AND PUBLIC PROCESS**

Maryland has been working with 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.

Maryland believes that a clear and transparent process and presentation of results is key to establishing and maintaining credibility for the trading program. MDE will use an electronic registry and web-based systems to support tracking and publicize trading opportunities such as offers to buy and sell, trade transactions, and program progress and performance.

An opportunity for public notice and comment is included in the NPDES permit process. If a 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.

MDE (or a delegated authority) 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, likely in the form of an on-line annual report.

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## APPENDIX A: NUTRIENT LOAD CAPS FOR MARYLAND'S SIGNIFICANT FACILITIES

POINT SOURCE*	COUNTY	DESIGN CAPACITY (MGD)	2006 FLOW (MGD)	2006 TNL (LBS/YR)	2006 TN DELIVERY FACTOR	ENR STRATEGY TOTAL NITROGEN LOAD CAP (LBS/YR)	2006 TPL (LBS/YR)	2006 TP DELIVERY FACTOR	ENR STRATEGY TOTAL PHOSPHORUS LOAD CAP (LBS/YR)	PROJECTED CONSTRUCTION COMPLETION YEAR**
<b>PATUXENT TRADING REGION</b>										
<b>PATUXENT RIVER TRIBUTARY BASIN</b>										
BOWIE	PRINCE GEORGES	3.300	1.94	30,805	0.84	40,201	1,680	0.70	3,015	2009
DORSEY RUN	ANNE ARUNDEL	2.000	1.25	11,540	0.84	24,364	164	0.70	1,827	Complete (2007)
FORT MEADE (FEDERAL)***	ANNE ARUNDEL	4.500	1.65	7,755	0.84	54,820	952	0.70	4,112	NA
LITTLE PATUXENT	HOWARD	25.000	19.08	249,333	0.84	304,556	14,721	0.70	22,842	2012
MARYLAND CITY	ANNE ARUNDEL	2.500	1.05	13,722	0.84	30,456	1,347	0.70	2,284	2010
MARLBORO MEADOWS (PRIVATE)***	PRINCE GEORGES	0.600	0.27	10,670	1.00	7,309	1,360	1.00	548	NA
PARKWAY	PRINCE GEORGES	7.500	5.69	62,575	0.84	91,367	2,422	0.70	6,853	2011
PATUXENT	ANNE ARUNDEL	7.500	5.06	31,705	0.84	91,367	4,866	0.70	6,853	2011
PINEY ORCHARD (PRIVATE)***	ANNE ARUNDEL	1.200	0.49	4,182	0.84	14,619	179	0.70	1,096	NA
WESTERN BRANCH	PRINCE GEORGES	30.000	19.26	100,036	1.00	365,467	27,493	1.00	27,410	
<b>TOTAL SIGNIFICANT (TRIBUTARY BASIN AND TRADING REGION)</b>		<b>84.100</b>	<b>55.73</b>	<b>522,323</b>		<b>1,024,526</b>	<b>55,184</b>		<b>76,839</b>	
<b>TOTAL NON-SIGNIFICANT (TRIBUTARY BASIN AND TRADING REGION)</b>		<b>0.817</b>	<b>0.25</b>	<b>11,679</b>		<b>20,999</b>	<b>1,405</b>		<b>3,500</b>	
<b>TOTAL INDUSTRIAL (TRIBUTARY BASIN AND TRADING REGION)</b>		<b>0.325</b>	<b>0.52</b>	<b>18,714</b>		<b>5,431</b>	<b>4,836</b>		<b>543</b>	
<b>TOTAL POINT SOURCES (TRIBUTARY BASIN AND TRADING REGION)</b>		<b>85.242</b>	<b>56.49</b>	<b>552,716</b>		<b>1,050,956</b>	<b>61,425</b>		<b>80,882</b>	

\*FACILITIES LISTED BY NAME ARE THOSE IDENTIFIED BY MARYLAND AS "SIGNIFICANT" (HAVING PLANNED DESIGN CAPACITY OF 500,000 GPD OR GREATER).

\*\* SCHEDULES ARE SUBJECT TO CHANGE

\*\*\* SCHEDULES FOR FACILITIES OTHER THAN THE 66 PRIORITIZED FOR ENR UPGRADE ARE NOT AVAILABLE (NA)

\*\*\*\* BASED ON CURRENT PERFORMANCE, ENR UPGRADE MAY NOT BE REQUIRED. FURTHER EVALUATION IS NECESSARY.

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# APPENDIX A: NUTRIENT LOAD CAPS FOR MARYLAND'S SIGNIFICANT FACILITIES

POINT SOURCE*	COUNTY	DESIGN CAPACITY (MGD)	2006 FLOW (MGD)	2006 TNL (LBS/YR)	2006 TN DELIVERY FACTOR	ENR STRATEGY TOTAL NITROGEN LOAD CAP (LBS/YR)	2006 TPL (LBS/YR)	2006 TP DELIVERY FACTOR	ENR STRATEGY TOTAL PHOSPHORUS LOAD CAP (LBS/YR)	PROJECTED CONSTRUCTION COMPLETION YEAR**
<b>POTOMAC TRADING REGION</b>										
<b>UPPER POTOMAC RIVER TRIBUTARY BASIN</b>										
BALLENGER CREEK	FREDERICK	6.000	5.17	118,960	0.73	73,093	3,506	0.68	5,482	2010
BRUNSWICK	FREDERICK	1.400	0.53	30,213	0.82	17,055	3,683	0.68	1,279	2008
CELANESE	ALLEGANY	2.000	1.20	19,929	0.57	24,364	802	0.68	1,827	Complete (2006)
CONOCOCHIEGUE	WASHINGTON	4.100	2.05	51,122	0.75	50,032	4,774	0.68	3,752	2009
CUMBERLAND	ALLEGANY	15.000	12.91	308,044	0.57	182,734	52,703	0.68	13,705	2009
EMMITSBURG	FREDERICK	0.750	0.39	7,686	0.73	9,137	2,271	0.68	685	2010
FORT DETRICK (FEDERAL)***	FREDERICK	2.000	0.65	16,027	0.73	24,364	2,742	0.68	1,827	NA
FREDERICK	FREDERICK	8.000	6.25	164,899	0.73	97,458	17,876	0.68	7,309	2011
GEORGES CREEK	ALLEGANY	0.600	0.74	36,266	0.57	7,309	3,956	0.68	548	2009
HAGERSTOWN	WASHINGTON	8.000	6.81	183,625	0.82	97,458	16,159	0.68	7,309	2010
MARYLAND CORRECTIONAL INSTITUTE	WASHINGTON	1.600	1.03	8,780	0.82	19,492	674	0.68	1,462	TBD****
MCKINNEY***	FREDERICK	12.000	0.00	0.00	0.00	146,187	0.00	0.00	10,964	NA
NICODEMUS	WASHINGTON	FLOW DIVERTED TO CONOCOCHIEQUE				NA			NA	NA
TANEYTOWN	CARROLL	1.100	0.77	10,944	0.73	13,400	3,998	0.68	1,005	2013
THURMONT	FREDERICK	1.000	0.82	10,888	0.73	12,182	843	0.68	914	2010
WESTMINSTER	CARROLL	5.000	4.20	55,528	0.73	60,911	7,133	0.68	4,568	2011
WINEBRENNER WWTP	WASHINGTON	1.000	0.20	14,377	0.82	12,182	975	0.68	914	2011
<b>TOTAL SIGNIFICANT (TRIBUTARY BASIN)</b>		<b>69.550</b>	<b>43.72</b>	<b>1,037,288</b>		<b>847,360</b>	<b>122,096</b>		<b>63,552</b>	
<b>TOTAL NON-SIGNIFICANT (TRIBUTARY BASIN)</b>		<b>6.184</b>	<b>3.54</b>	<b>186,876</b>		<b>211,293</b>	<b>31,271</b>		<b>35,215</b>	
<b>TOTAL INDUSTRIAL (TRIBUTARY BASIN)</b>		<b>21.500</b>	<b>24.37</b>	<b>136,438</b>		<b>120,085</b>	<b>12,278</b>		<b>31,383</b>	
<b>TOTAL POINT SOURCES (TRIBUTARY BASIN)</b>		<b>97.234</b>	<b>71.63</b>	<b>1,360,602</b>		<b>1,178,738</b>	<b>165,645</b>		<b>130,150</b>	

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## APPENDIX A: NUTRIENT LOAD CAPS FOR MARYLAND'S SIGNIFICANT FACILITIES

POINT SOURCE*	COUNTY	DESIGN CAPACITY (MGD)	2006 FLOW (MGD)	2006 TNL (LBS/YR)	2006 TN DELIVERY FACTOR	ENR STRATEGY TOTAL NITROGEN LOAD CAP (LBS/YR)	2006 TPL (LBS/YR)	2006 TP DELIVERY FACTOR	ENR STRATEGY TOTAL PHOSPHORUS LOAD CAP (LBS/YR)	PROJECTED CONSTRUCTION COMPLETION YEAR**
<b>POTOMAC TRADING REGION</b>										
<b>MIDDLE POTOMAC RIVER TRIBUTARY BASIN</b>										
BLUE PLAINS (MD PORTION) <sup>4</sup>	DISTRICT OF COLUMBIA	169.600	124.45	2,153,592	1.00	2,066,108	30,045	1.00	92,975	2016
BELTSVILLE USDA EAST (FEDERAL)***	PRINCE GEORGES	0.620	0.15	1,518	1.00	7,553	793	1.00	566	NA
DAMASCUS	MONTGOMERY	1.500	0.84	18,682	0.85	18,273	1,322	0.68	1,371	2009
PISCATAWAY	PRINCE GEORGES	30.000	21.48	160,709	1.00	365,467	6,698	1.00	16,446	2009
POOLESVILLE	MONTGOMERY	0.750	0.57	15,139	0.85	9,137	270	0.68	685	2010
SENECA CREEK <sup>4</sup>	MONTGOMERY	20.000	15.26	226,372	0.85	243,645	3,876	0.68	18,273	2011
<b>TOTAL SIGNIFICANT (TRIBUTARY BASIN)</b>		<b>222.470</b>	<b>162.75</b>	<b>2,576,012</b>		<b>2,710,183</b>	<b>43,003</b>		<b>130,316</b>	
<b>TOTAL NON-SIGNIFICANT (TRIBUTARY BASIN)</b>		<b>0.420</b>	<b>0.15</b>	<b>6,557</b>		<b>13,367</b>	<b>1,035</b>		<b>2,228</b>	
<b>TOTAL INDUSTRIAL (TRIBUTARY BASIN)</b>		<b>0.000</b>	<b>0.00</b>	<b>0</b>		<b>0</b>	<b>0</b>		<b>0</b>	
<b>TOTAL POINT SOURCES (TRIBUTARY BASIN)</b>		<b>222.890</b>	<b>162.9</b>	<b>2,582,569</b>		<b>2,723,550</b>	<b>44,038</b>		<b>132,544</b>	

<sup>4</sup> A permit modification for Seneca is pending that will implement a loading reallocation between the two WSSC service areas at Seneca and Blue Plains

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<b>POTOMAC TRADING REGION (CONTINUED)</b>										
<b>LOWER POTOMAC RIVER TRIBUTARY BASIN</b>										
INDIAN HEAD	CHARLES	0.500	0.31	17,594	1.00	6,091	3,203	1.00	457	2008
NSWC-INDIAN HEAD (FEDERAL)***	CHARLES	0.500	0.42	24,879	1.00	6,091	1,711	1.00	457	NA
LA PLATA	CHARLES	1.500	1.16	15,540	1.00	18,273	354	1.00	1,371	2011
LEONARDTOWN	SAINT MARYS	0.680	0.43	7,555	1.00	8,284	1,665	1.00	621	2009
MATTAWOMAN	CHARLES	20.000	10.64	167,858	1.00	243,645	5,053	1.00	10,964	TBD****
SWAN POINT	CHARLES	0.600	0.07	3,912	1.00	7,309	652	1.00	548	Complete (2007)
<b>TOTAL SIGNIFICANT (TRIBUTARY BASIN)</b>		<b>23.780</b>	<b>13.03</b>	<b>237,338</b>		<b>289,694</b>	<b>12,639</b>		<b>14,418</b>	
<b>TOTAL NON-SIGNIFICANT (TRIBUTARY BASIN)</b>		<b>0.369</b>	<b>0.20</b>	<b>8,854</b>		<b>10,410</b>	<b>1,267</b>		<b>1,755</b>	
<b>TOTAL INDUSTRIAL (TRIBUTARY BASIN)</b>		<b>0.486</b>	<b>0.35</b>	<b>2,139</b>		<b>1,777</b>	<b>3,175</b>		<b>740</b>	
<b>TOTAL POINT SOURCES (TRIBUTARY BASIN)</b>		<b>24.635</b>	<b>13.58</b>	<b>248,331</b>		<b>301,881</b>	<b>17,081</b>		<b>16,913</b>	
<b>TOTAL SIGNIFICANT (TRADING REGION)</b>		<b>315.800</b>	<b>219.5</b>	<b>3,850,638</b>		<b>3,847,236</b>	<b>177,738</b>		<b>208,286</b>	
<b>TOTAL NON-SIGNIFICANT (TRADING REGION)</b>		<b>6.973</b>	<b>3.89</b>	<b>202,287</b>		<b>235,070</b>	<b>33,573</b>		<b>39,199</b>	
<b>TOTAL INDUSTRIAL (TRADING REGION)</b>		<b>21.986</b>	<b>24.72</b>	<b>138,577</b>		<b>121,863</b>	<b>15,453</b>		<b>32,122</b>	
<b>TOTAL POINT SOURCES (TRADING REGION)</b>		<b>344.758</b>	<b>248.11</b>	<b>4,191,502</b>		<b>4,204,169</b>	<b>226,764</b>		<b>279,607</b>	

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POINT SOURCE*	COUNTY	DESIGN CAPACITY (MGD)	2006 FLOW (MGD)	2006 TNL (LBS/YR)	2006 TN DELIVERY FACTOR	ENR STRATEGY TOTAL NITROGEN LOAD CAP (LBS/YR)	2006 TPL (LBS/YR)	2006 TP DELIVERY FACTOR	ENR STRATEGY TOTAL PHOSPHORUS LOAD CAP (LBS/YR)	PROJECTED CONSTRUCTION COMPLETION YEAR**
<b>EASTERN SHORE/WESTERN SHORE TRADING REGION</b>										
<b>PATAPSCO/BACK RIVER TRIBUTARY BASIN</b>										
BACK RIVER	BALTIMORE	180.000	162.26	3,746,955	1.00	2,192,803	73,353	1.00	109,640	2013
COX CREEK	ANNE ARUNDEL	15.000	11.18	249,392	1.00	182,734	36,303	1.00	13,705	2010
FREEDOM DISTRICT	CARROLL	3.500	2.19	65,595	0.83	42,638	4,055	0.95	3,198	2011
MOUNT AIRY	CARROLL	1.200	0.70	14,687	0.83	14,619	1,482	0.95	1,096	2009
PATAPSCO	BALTIMORE CITY	73.000	50.49	2,761,350	1.00	889,304	161,559	1.00	66,698	2010
<b>TOTAL SIGNIFICANT (TRIBUTARY BASIN)</b>		<b>272.700</b>	<b>226.81</b>	<b>6,837,979</b>		<b>3,322,097</b>	<b>276,752</b>		<b>194,337</b>	
<b>TOTAL NON-SIGNIFICANT (TRIBUTARY BASIN)</b>		<b>0.430</b>	<b>0.16</b>	<b>4,713</b>		<b>10,767</b>	<b>821</b>		<b>1,795</b>	
<b>TOTAL INDUSTRIAL (TRIBUTARY BASIN)</b>		<b>19.616</b>	<b>83.31</b>	<b>1,847,277</b>		<b>541,162</b>	<b>88,983</b>		<b>27,369</b>	
<b>TOTAL POINT SOURCES (TRIBUTARY BASIN)</b>		<b>292.746</b>	<b>310.28</b>	<b>8,689,969</b>		<b>3,874,026</b>	<b>366,556</b>		<b>223,501</b>	
<b>UPPER WESTERN SHORE TRIBUTARY BASIN</b>										
ABERDEEN	HARFORD	4.000	1.99	25,651	1.00	48,729	1,238	1.00	3,655	2010
ABERDEEN PROVING GROUNDS-ABERDEEN	HARFORD	2.800	0.94	16,326	1.00	34,110	379	1.00	2,558	Complete (2006)
ABERDEEN PROVING GROUNDS-EDGEWOOD (FEDERAL)***	HARFORD	3.000	0.96	19,018	1.00	36,547	3,452	1.00	2,741	NA
HAMPSTEAD***	CARROLL	0.900	0.62	29,711	0.58	10,964	315	0.44	822	NA
HAVRE DE GRACE	HARFORD	2.275	1.52	30,779	1.00	27,715	2,375	1.00	2,079	2010
JOPPATOWNE	HARFORD	0.950	0.90	20,586	1.00	11,573	2,158	1.00	868	2010
SOD RUN	HARFORD	20.000	12.38	360,875	1.00	243,645	33,583	1.00	18,273	2011
<b>TOTAL SIGNIFICANT (TRIBUTARY BASIN)</b>		<b>33.925</b>	<b>19.31</b>	<b>502,946</b>		<b>413,282</b>	<b>43,500</b>		<b>30,996</b>	
<b>TOTAL NON-SIGNIFICANT (TRIBUTARY BASIN)</b>		<b>1.240</b>	<b>0.55</b>	<b>33,458</b>		<b>40,599</b>	<b>3,589</b>		<b>5,728</b>	
<b>TOTAL INDUSTRIAL (TRIBUTARY BASIN)</b>		<b>0.000</b>	<b>0.00</b>	<b>0</b>		<b>0</b>	<b>0</b>		<b>0</b>	
<b>TOTAL POINT SOURCES (TRIBUTARY BASIN)</b>		<b>35.165</b>	<b>19.86</b>	<b>536,404</b>		<b>453,882</b>	<b>47,089</b>		<b>36,725</b>	
<b>LOWER WESTERN SHORE TRIBUTARY BASIN</b>										
ANNAPOLIS	ANNE ARUNDEL	13.000	8.31	133,083	1.00	158,369	23,150	1.00	11,878	2010
BROADNECK	ANNE ARUNDEL	6.000	4.99	49,867	1.00	73,093	7,549	1.00	5,482	2010
BROADWATER	ANNE ARUNDEL	2.000	1.13	13,848	1.00	24,364	2,244	1.00	1,827	2011
CHESAPEAKE BEACH	CALVERT	1.500	0.85	8,195	1.00	18,273	2,223	1.00	1,371	2011
MARLAY TAYLOR (A.K.A. PINE HILL RUN)	SAINT MARYS	6.000	4.03	72,423	1.00	73,093	14,428	1.00	5,482	2011
MAYO LARGE COMMUNAL	ANNE ARUNDEL	0.820	0.49	26,525	1.00	9,989	1,187	1.00	749	2010
US NAVAL ACADEMY (FEDERAL)***	ANNE ARUNDEL	1.000	0.12	2,924	1.00	12,182	166	1.00	914	NA
<b>TOTAL SIGNIFICANT (TRIBUTARY BASIN)</b>		<b>30.320</b>	<b>19.92</b>	<b>306,865</b>		<b>369,366</b>	<b>50,947</b>		<b>27,703</b>	
<b>TOTAL NON-SIGNIFICANT (TRIBUTARY BASIN)</b>		<b>0.099</b>	<b>0.04</b>	<b>2,364</b>		<b>2,108</b>	<b>212</b>		<b>351</b>	
<b>TOTAL INDUSTRIAL (TRIBUTARY BASIN)</b>		<b>0.000</b>	<b>0.00</b>	<b>0</b>		<b>0</b>	<b>0</b>		<b>0</b>	
<b>TOTAL POINT SOURCES (TRIBUTARY BASIN)</b>		<b>30.419</b>	<b>19.96</b>	<b>309,229</b>		<b>371,474</b>	<b>51,159</b>		<b>28,054</b>	

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<b>EASTERN SHORE/WESTERN SHORE TRADING REGION (CONTINUED)</b>										
<b>UPPER EASTERN SHORE TRIBUTARY BASIN</b>										
CENTREVILLE	QUEEN ANNES	0.500	0.09	1,292	1.00	3,004	154	1.00	751	TBD****
CHESTERTOWN	KENT	1.500	0.75	17,385	1.00	18,273	6,141	1.00	1,371	2008
ELKTON	CECIL	3.050	1.64	106,345	1.00	37,156	3,263	1.00	2,787	2008
KENT ISLAND	QUEEN ANNES	3.000	1.32	106,083	1.00	36,547	2,299	1.00	2,741	Complete (2007)
NORTHEAST RIVER	CECIL	2.000	0.97	8,221	1.00	24,364	1,427	1.00	1,827	Complete (2005)
PERRYVILLE	CECIL	1.650	0.71	19,097	1.00	20,101	1,065	1.00	1,508	2009
ROCK HALL***	KENT	0.505	0.22	7,318	1.00	6,152	196	1.00	461	NA
TALBOT COUNTY REGION II	TALBOT	0.660	0.44	25,690	1.00	8,040	3,928	1.00	603	2008
<b>TOTAL SIGNIFICANT (TRIBUTARY BASIN)</b>		<b>12.865</b>	<b>6.14</b>	<b>291,431</b>		<b>153,637</b>	<b>18,473</b>		<b>12,049</b>	
<b>TOTAL NON-SIGNIFICANT (TRIBUTARY BASIN)</b>		<b>1.995</b>	<b>1.03</b>	<b>57,888</b>		<b>60,886</b>	<b>9,473</b>		<b>10,148</b>	
<b>TOTAL INDUSTRIAL (TRIBUTARY BASIN)</b>		<b>0.230</b>	<b>0.25</b>	<b>8,876</b>		<b>5,605</b>	<b>6,255</b>		<b>2,312</b>	
<b>TOTAL POINT SOURCES (TRIBUTARY BASIN)</b>		<b>15.09</b>	<b>7.42</b>	<b>358,195</b>		<b>220,128</b>	<b>34,201</b>		<b>24,508</b>	
<b>CHOPTANK RIVER TRIBUTARY BASIN</b>										
CAMBRIDGE	DORCHESTER	8.100	3.74	38,937	1.00	98,676	3,986	1.00	7,401	2010
DENTON	CAROLINE	0.800	0.38	5,272	1.00	9,746	680	1.00	731	2011
EASTON	TALBOT	4.000	2.51	97,989	1.00	48,729	18,225	1.00	3,655	Complete (2007)
<b>TOTAL SIGNIFICANT (TRIBUTARY BASIN)</b>		<b>12.900</b>	<b>6.63</b>	<b>142,198</b>		<b>157,151</b>	<b>22,891</b>		<b>11,787</b>	
<b>TOTAL NON-SIGNIFICANT (TRIBUTARY BASIN)</b>		<b>1.473</b>	<b>0.77</b>	<b>37,272</b>		<b>44,454</b>	<b>5,634</b>		<b>6,991</b>	
<b>TOTAL INDUSTRIAL (TRIBUTARY BASIN)</b>		<b>0.750</b>	<b>0.62</b>	<b>4,945</b>		<b>4,500</b>	<b>1,214</b>		<b>370</b>	
<b>TOTAL POINT SOURCES (TRIBUTARY BASIN)</b>		<b>15.123</b>	<b>8.02</b>	<b>184,415</b>		<b>206,105</b>	<b>29,739</b>		<b>19,147</b>	

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<b>EASTERN SHORE/WESTERN SHORE TRADING REGION (CONTINUED)</b>										
<b>LOWER EASTERN SHORE TRIBUTARY BASIN</b>										
CRISFIELD	SOMERSET	1.000	0.71	30,184	1.00	12,182	3,527	1.00	914	2008
DELMAR	WICOMICO	0.850	0.47	21,209	1.00	10,355	692	1.00	777	2010
FEDERALSBURG	CAROLINE	0.750	0.29	19,326	1.00	9,137	641	1.00	685	2009
FRUITLAND	WICOMICO	0.800	0.54	4,576	1.00	9,746	1,854	1.00	731	2012
HURLOCK	DORCHESTER	1.650	1.10	31,125	1.00	20,101	8,521	1.00	1,508	Complete (2006)
POCOMOKE CITY	WORCESTER	1.470	0.58	16,717	1.00	17,908	1,906	1.00	1,343	2012
PRINCESS ANNE	SOMERSET	1.260	0.47	7,171	1.00	15,350	167	1.00	1,151	2013
SALISBURY	WICOMICO	8.500	5.13	453,930	1.00	103,549	29,451	1.00	7,766	2008
SNOW HILL	WORCESTER	0.500	0.31	17,856	1.00	6,091	3,685	1.00	457	2010
<b>TOTAL SIGNIFICANT (TRIBUTARY BASIN)</b>		<b>16.780</b>	<b>9.60</b>	<b>602,094</b>		<b>204,418</b>	<b>50,444</b>		<b>15,332</b>	
<b>TOTAL NON-SIGNIFICANT (TRIBUTARY BASIN)</b>		<b>1.300</b>	<b>1.08</b>	<b>33,327</b>		<b>48,800</b>	<b>7,235</b>		<b>8,133</b>	
<b>TOTAL INDUSTRIAL (TRIBUTARY BASIN)</b>		<b>0.000</b>	<b>0.00</b>	<b>0</b>		<b>0</b>	<b>0</b>		<b>0</b>	
<b>TOTAL POINT SOURCES (TRIBUTARY BASIN)</b>		<b>18.080</b>	<b>10.68</b>	<b>635,421</b>		<b>253,218</b>	<b>57,679</b>		<b>23,465</b>	
<b>TOTAL SIGNIFICANT (TRADING REGION)</b>		<b>379.490</b>	<b>288.41</b>	<b>8,683,513</b>		<b>4,619,951</b>	<b>463,007</b>		<b>292,204</b>	
<b>TOTAL NON-SIGNIFICANT (TRADING REGION)</b>		<b>6.537</b>	<b>3.63</b>	<b>169,022</b>		<b>207,616</b>	<b>26,964</b>		<b>33,146</b>	
<b>TOTAL INDUSTRIAL (TRADING REGION)</b>		<b>20.596</b>	<b>84.18</b>	<b>1,861,098</b>		<b>551,267</b>	<b>96,452</b>		<b>30,051</b>	
<b>TOTAL POINT SOURCES (TRADING REGION)</b>		<b>406.623</b>	<b>376.04</b>	<b>11,297,851</b>		<b>5,378,834</b>	<b>586,423</b>		<b>355,401</b>	

\*FACILITIES LISTED BY NAME ARE THOSE IDENTIFIED BY MARYLAND AS "SIGNIFICANT" (HAVING PLANNED DESIGN CAPACITY OF 500,000 GPD OR GREATER).

\*\* SCHEDULES ARE SUBJECT TO CHANGE

\*\*\* SCHEDULES FOR FACILITIES OTHER THAN THE 66 PRIORITIZED FOR ENR UPGRADE ARE NOT AVAILABLE (NA)

\*\*\*\* BASED ON CURRENT PERFORMANCE, ENR UPGRADE MAY NOT BE REQUIRED. FURTHER EVALUATION IS NECESSARY.

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## APPENDIX B: EXAMPLE CALCULATIONS OF CREDITS

### B.1 The OSDS Hookup Credit Assumptions

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 – 12.2 lbs/yr nitrogen;
- B. Within 1,000 feet of any perennial surface water - 7.5 lbs/yr nitrogen;
- C. All other – 4.6 lbs/yr nitrogen

Credits for connecting non-residential systems will be established on a case-by-case basis.

The OSDS hookup credit assumptions are based on the following:

The Chesapeake Bay Program assumes the average residential septic system delivers about 12 lbs of nitrogen per year to the Bay. This figure is compatible with MDE estimates and is based on 3.2 people per system, with each person generating 9.5 lbs of nitrogen per year. The 12 lbs reflects a 60 percent reduction in load from the edge of the drain field due to losses in transport. MDE recognizes that the actual delivery rate will vary with travel time and discharge location. For the purpose of providing offsets that favor retiring OSDS having the biggest impact on surface waters, 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). Based on these assumptions, nitrogen loading to surface water per OSDS would be 24.3 lbs/yr in the critical area, 15.2 lbs/yr 1,000 feet from any perennial surface water and 9.2 lbs/yr for all other systems. Maryland's Tributary Strategy calls for the average residential septic system to be upgraded to reduce the load of nitrogen from OSDSs by 50 percent. For nitrogen trading purposes, equivalent dwelling units (EDUs) served by OSDSs have the following load allocations: in critical areas, 12.2 lbs/yr; within 1,000 feet of any perennial surface water, 7.5 lbs/yr; and for all other OSDSs, 4.6 lbs/yr.

With regard to phosphorus, the Chesapeake Bay Program assumes the average residential septic system delivers no total phosphorus. Therefore, the allocation approval would require demonstration that the proposed ENR facility will meet its existing permit requirements for phosphorus after accounting for projected increased phosphorus loading of 0.23 lbs of total phosphorus per EDU connected. Offsets 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.

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## APPENDIX B: EXAMPLE CALCULATIONS OF CREDITS

### B.2 Sample Calculation of Available Nitrogen Discharge Credits from ENR facility

Design Capacity, mgd	30.00
Current Flow, mgd	20.00
Commitments, in accordance with Capacity Management Plan (mgd)	2.00
Concentration Basis of WLA, mg/L	4.00
Current Annual N Concentration, mg/L	3.00
Projected Performance, mg/l	3.00
Wasteload Allocation, lbs/yr ( $30 * 4 * 8.344 * 365$ )	365,467
Current Load ( $20 * 3 * 8.344 * 365$ )	182,734
Unused Allocation ( $365,467 - 182,734$ )	182,733
Load Associated with Commitments ( $2 * 3 * 8.344 * 365$ )	18,273
Unused and Unneeded Allocation	164,460
State Retirement Ratio of 5%	8,223
Unused and Unneeded Allocation with State Retirement Ratio of 5% Available to Trade ( $164,460 - 8,223$ )	156,237

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**APPENDIX B: EXAMPLE CALCULATIONS OF CREDITS**

**B.3 Sample Calculation of Available Nitrogen Discharge Credits from Minor Upgrading to ENR-level Treatment**

Design Capacity, mgd	0.40
Current Flow, mgd	0.20
Commitments, in accordance with Capacity Management Plan (mgd)	0.10
2020 Projected flow	0.30
Current Flow and Commitments, mgd ( 0.20 + 0.10)	0.30
Concentration Basis of WLA, mg/L	18.00
Concentration Basis of Wasteload Allocation after upgrade, mg/l	4.00
Current Wasteload allocation, lbs/yr (2020 flowx18mg/l) (0.3 * 18 * 8.344 * 365)	16,446
Wasteload Allocation after upgrade (0.3 * 4 * 8.344 * 365 = 3,655)	3,655
Difference between previous allocation and new reduced allocation (16,446 – 3,655)	12,791
State Retirement Ratio of 5% to be applied to MDE WLA ( 12,791 x 0.05)	640
Total WLA available to trade (12,791 – 640)	12,151