Accounting for Growth
Discussion Draft dated July 12, 2012

A. Introduction

Restoring Chesapeake Bay requires not only that we reduce the current amount of pollution entering the Bay, but that we hold the line against new pollution. Population increase and economic growth add more pollution to the Bay and, unless properly addressed, could defeat the restoration efforts that began over 20 years ago and continue today. This document sets out Maryland's proposed plan for managing the pollution from growth, residential and nonresidential. We encourage your comments and suggestions on the proposed plan. The proposal will be adjusted and refined as stakeholders, citizens, and State agencies share ideas.

The Chesapeake Bay cleanup plan (the Watershed Implementation Plan or "WIP") requires the Bay watershed states to reduce the amount (usually referred to as the "load") of nutrients and sediment that currently enter the Bay to a Total Maximum Daily Load ("TMDL"). The TMDL represents the maximum amount of nutrients and sediment that the Bay can receive and still maintain the water quality necessary for a healthy environment. The WIP calls for existing sewage treatment plants, septic systems, agriculture and urban stormwater sources to reduce their loads. Because population growth and new development add load to what is already entering the Bay from development-related sources, the WIP also requires that the new or increased loads be offset by reductions elsewhere, so there is no net increase the amount of nutrient and sediment pollution entering the Bay from these sources. In the WIP, Maryland committed to completing a fully implementable a growth offset program in place by the end of 2013.

The Maryland WIP accounts for loads from new development in two ways. First, part of the TMDL allocated to wastewater treatment plants ("WWTP") has been reserved for growth. The existing Enhanced Nutrient Removal ("ENR") Cap Strategy allows flow increases at major sewage treatment plants to design capacity, while establishing a nutrient loading cap and wasteload allocations ("WLAs") in their discharge permits. The interim and target point source loads were set to allow growth up to the permitted WLAs. Second, Maryland's strategy to account for growth, when completed by the end of 2013, will establish a strategy to offset new loads (other than discharges to WWTPs with available capacity). In this context, "offset" means to counterbalance an increase of load with other reductions. Sometimes the term also refers to the pounds of pollutant that must be counterbalanced. To be usable as an offset, a reduction must be ***in addition to the reductions to existing loads*** that are necessary to achieve the TMDL.

The Maryland Department of the Environment (MDE) has ample statutory authority to enact an offset program. In particular, Environment Article, Title 9, Subtitle 3, Annotated Code of Maryland, directs MDE to carry out certain objectives, including "to improve, conserve, and manage the quality of the waters of this State." § 9-302.

Minimizing loads from new development is essential to the success of the strategy to offset growth. It reduces the need for offsets and helps preserve offsets for physical and economic development that is vital to the State and local jurisdictions. Maryland's Accounting for Growth strategy will encourage counties and municipalities to manage their growth and help make offsets available for the growth and development they want.

This discussion draft explains the policies and proposed mechanism for managing the load from growth and development. After significant outreach and stakeholder involvement, the Maryland Department of the Environment (MDE) will propose regulations to implement the policies and mechanism.

B. Relationship to Other Development Rules

The offset requirements described in this document are in addition to federal, state, and local laws and regulations. Thus, any new development must comply with planning, zoning, and development review requirements; water and sewer plan requirements; stormwater management, erosion and sediment control; wetlands regulations; and other laws and regulations as well as complying with the offset requirements.

C. The Concept from the Phase II WIP to this Policy

Section 1.8 of the Phase II WIP anticipated that the policy will include the following:

New development shall meet all applicable Maryland law and regulations and offset post-development nonpoint source loads.

Redevelopment as defined in State Stormwater Management Regulations, must satisfy applicable stormwater regulations, but will not be required to offset post-development nonpoint source loads.

New Septic Systems shall meet all applicable Maryland law and regulations and fully offset the post-development septic load.

Point sources: New point source loads, and increased loads from existing point sources above their WLA, shall be offset

This proposed policy is consistent with these principles. The chief difference is that the proposed policy is based on nitrogen exclusively. This adjustment is driven partly by a desire to make the policy simple to understand and implement and partly by the idea that by managing the nitrogen load, we will ensure that the goals for phosphorus and sediment are also met Bay-wide.

Nitrogen from development is frequently more difficult to control than phosphorus and sediment because it is relatively soluble in water. For precipitation-driven nonpoint source runoff, practices like sediment and erosion control, stormwater management practices, and environmentally sensitive site design can be expected to be

more effective at removing sediment and phosphorus than nitrogen. For WWTPs, phosphorus is effectively controlled through the combination of the longstanding phosphate ban, WWTP treatment technologies and the discharge permit limits. On-site subsurface sewage systems release little or no sediment or phosphorus. As a result, if nitrogen from development sources is effectively controlled, phosphorus and sediment will also be controlled.

The Phase II WIP contemplated that offset requirements (1) might vary among areas depending on the loading implications of development in those areas, and (2) be calculated as the difference between the post-development load and forested conditions. After considering the post-development loads under various development scenarios, we are not proposing any differential or ratio related to the characteristics of the area to be developed. In addition, we are proposing that the entire post-development load be offset. This proposal, combined with the trading policies that retire 5% of every point source to point source credit traded and 10% for every non-point source credit, affords a significant margin of safety.

The Department of the Environment believes that it can implement the proposed policy under its existing authority to regulate discharges and water quality. The Department will likely propose additional regulations under its existing authority, and use general or individual permits to implement the proposal.

D. Trading

Trading, consistent with Maryland's trading policies, will be allowed as a means of offsetting nitrogen loads. The sale and purchase of nutrient credits to offset post-development load will have to comply with all the requirements imposed by Maryland's Nutrient Trading Policies *in addition to the specific requirements of the policy for offsetting new load from growth.* The trading policies may have to be revised, but this will proceed independently from the finalization of the Accounting for Growth policy. These documents explain the current trading policy:

- o **Phase I of the Trading Policy,** *Maryland Policy for Nutrient Cap Management and Trading in Maryland's Chesapeake Bay Watershed* (Final, April, 2008). Phase I outlines an approach for trading between point sources[1] and trading involving the removal of onsite sewage disposal systems commonly known as septic systems.

- o **Phase II – A of the Policy,** *Guidelines for the Generation of Agricultural Nonpoint Nutrient Credits* (Draft, April 2008)**.** This policy was developed by the Maryland Department of Agriculture Nutrient Trading Advisory Committee and addresses point source to nonpoint[2] source trading.

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[1] A point source is a source permitted to discharge to surface water from a specific outlet, such as a sewage treatment plant or industrial facility. The permits for point sources are issued under the National Pollution Discharge Elimination System (NPDES) provisions of the federal Clean Water Act.

[2] A nonpoint source is a source of pollution that is not a point source. It originates from diffuse pollution sources (i.e., without a single point of origin or not introduced into a receiving stream from a specific

o **Phase II – B,** *Guidelines for the Exchange of Nonpoint Credits: Maryland's Trading Market Place,* (Draft, April 2008)**.** This policy was also developed by the Department of Agriculture and establishes a marketplace and registry for selling agricultural nutrient credits.

In 2010, the Maryland legislature established a credit certification program for nutrients and, in 2012, added sediment to the program. Under this law, the Maryland Department of Agriculture is authorized to establish requirements for the voluntary certification and registration for credits on agricultural land, and to establish a public credit registry. It has done so for nitrogen and phosphorus, and established a web-based Calculation Tool, Marketplace and Trading Registry. The Calculation Tool assesses credit generating capacity while the Market Place and Trading Registry will record approved credits and transactions and provide a means for the public to track the progress of Maryland's trading program.

Trading is structured through a unit of trade called a credit, which is equal to one pound of nitrogen or phosphorus per year. In order to ensure equivalent water quality results, delivery factors, as determined by the Bay Program and the Department, will be applied to account for possible differences in delivered loads between the trading partners due to location. The monetary value of credits will be determined by the market.

Under current Trading Policies, credits can be traded within defined trading areas. At this time, these areas are defined as:

o the Potomac basin;

o the Patuxent basin; and

o everywhere else within the state.

Other trading areas could be devised. For example, trading could be allowed within, but not between, the five major basins in the Maryland Bay Watershed (Potomac River, Eastern Shore, Western Shore, the Patuxent River and Maryland's portion of the Susquehanna River), or three areas (Potomac River, Eastern Shore, and the combined Patuxent, Western Shore and Maryland's portion of the Susquehanna River) or trading could be expanded to include areas in other states.

In order to further support Bay restoration and preservation and protect local water quality, the policy for Accounting for Growth also seeks to minimize pollutant load from new growth so fewer offsets are needed and to encourage use of offsets for the optimum economic development in Maryland. It proposes to accomplish this by establishing additional conditions on trading geographies. New development in a Targeted Growth and Revitalization Area (a PlanMaryland Planning Area) served by an ENR WWTP will be able to obtain offsets anywhere in the TMDL watershed allowed by the trading policy, while all other new development must obtain offsets in County where

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outlet). Pollutants from non-point sources 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.

the development is located. This restriction does not limit where those who generate credits can sell them.

This aspect of the policy recognizes the important role that local zoning and other land use management plans and programs play in shaping the nature and location of development, and the resulting post-development loading rates. The Maryland Department of Planning has reviewed the current per capita loading rates from different types of development by Bay Watershed Model Segment, and the associated numbers of residents and jobs accommodated for a given nitrogen load. A full description of the methodology and calculations are beyond the scope of this discussion draft, but the results are shown in the following table. Loads from development in the future should be as much as 50% less than these, as a result of relatively new stormwater regulations and proposed requirements for BAT for nitrogen removal for on-site wastewater systems. However, the relative differences between per capita loading rates among development types for jobs, population and load represented in the table are expected to remain comparable to those shown.

Dominant Development Type by Bay Model Segment	Pounds N[1,2] per Job/Resident	Jobs/Residents[2] per 100 Pounds Nitrogen[1]
High Density on ENR	<2.5 to 3.0	38 to 44
Mix Non-ENR & Septics	8.5 to 9.1	12 to 13
Large Lots no Sewer	22 to 25	4 to 5

[1] N from existing development only [2] 95% Confidence Interval for Mean

The trading policies establish rules for trading. For example, all nutrient pollution 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. Trades must result in a net decrease in loads. A portion of a trade will be retired and used to achieve the TMDL, the other portion becomes an offset. Developers will have to comply with the rules in the trading policies as well as any additional constraints that may be imposed by the policy for offsetting the pollutant load from growth.

The baseline pollution control and reduction requirements must be achieved before any additional pollution reductions can qualify as credits. That is, credits are generated only by going beyond the baseline requirements of applicable laws and regulations, as well as the reductions required to meet the TMDL.

Among the other essential elements of a trading system are verification that the credits exist, certification of credits, enforceability, accountability and tracking. Because the load from new development must be permanently offset, these features are especially important and challenging.

E. Step by Step

1. Does the project satisfy the definition of redevelopment?

Under Maryland's stormwater regulations, "Redevelopment" means any construction, alteration, or improvement performed on sites where existing land use is commercial, industrial, institutional, or multifamily residential and the existing site impervious area exceeds 40 percent. In most circumstances, redevelopment will meet the stormwater regulations if the developer (a) reduces existing impervious area within the limit of disturbance by at least 50 percent (b) implements ESD to the MEP to provide water quality treatment for at least 50 percent of the existing impervious area within the limit of disturbance or (c) uses a combination of (a) and (b) for at least 50 percent of the existing site impervious area. Because redevelopment is not a change in land use, and because redevelopment patently reduces the stormwater loading of nitrogen, and because redevelopment usually involves denser, more compact development than the development it is replacing, redevelopment is favored from a water quality point of view. For these reasons, no offset is required for stormwater from redevelopment.

2. Calculating the post-development load.

The pre-development nutrient load shall not be considered in the determination of the post-development load. The developer must calculate the entire post-development load, not the difference between the post-development load and the pre-development load. MDE has a spreadsheet that facilitates the calculation.

Under Maryland's WIP, a change in land use resulting from new development is accounted for as a change in pollution source inventory, and is not considered part of the growth offset process. As discussed previously, redevelopment as defined under State Stormwater Regulations will not be subject to offset requirements for the stormwater load. If the development or redevelopment sends its wastewater to a WWTP that can treat and discharge it in compliance with the WWTP's discharge permit, *i.e.*, remaining below its nutrient loading cap and WLA, the wastewater load will not be counted as part of the post-development load. With these qualifications, the post-development load will include the stormwater load as well as the wastewater load, and must be fully offset.

If the development will use on-site sewage disposal systems, the load for each household or equivalent unit using a conventional septic system is 9.86 lbs of nitrogen. A system using best available technology (BAT) removes about half the nitrogen, so its load is 4.93 lbs of nitrogen. These numbers are based on a state-wide delivery factor from these onsite systems of 42.5%.

A system using land application of treated wastewater will be controlled by a discharge permit requiring zero discharge of nitrogen to the groundwater. Such a system will have a zero post-development wastewater load.

If a development is served by a wastewater treatment plant that discharges to surface water, the initial question is whether the WWTP has capacity to accept the wastewater and stay within its nutrient cap. The WWTP can provide this information. If the WWTP has capacity it can accept the additional load, using up some of its capacity but requiring no further offset. If the WWTP does not have capacity, an offset will be

required and memorialized in the WWTP's discharge permit. The amount of the offset can be calculated by the spreadsheet using the nitrogen limit in the WWTP's permit.

Stormwater runoff from developed land can also be calculated by using the spreadsheet. The developer must determine how many acres of the final development have a pervious surface, an impervious surface, or are covered by forest. Environmental Site Design to the Maximum Extent Practicable (ESD to the MEP) is required for new development; implementation of ESD to the MEP reduces nitrogen by 50%. These factors are all incorporated into the spreadsheet; entering the number of acres of each type calculates the post-development stormwater load from the developed parcel in pounds of nitrogen. Development that receives an administrative waiver from the stormwater regulations under COMAR 26.17.02.01-2 must calculate the actual post-development nutrient pollution load and offset it.

Consideration must also be given to the indirect effects of development on nitrogen reaching the Bay. For several decades, vehicle miles traveled (VMT) has risen faster than the increase in population, in Maryland and nationwide. Land use development over the past 40 to 50 years has put more people living beyond the reach of easy access to transit facilities. In general, VMT per capita falls as population density rises, but there is a marked difference between VMT for Census Tracts with at least 10,000 people per square mile and all others. Considering the amount of nitrogen (as NO_x) emitted by vehicles and the amount deposited in Maryland, MDE has approximated the nitrogen pollution due to VMT as 1.0 pounds of nitrogen per household for census tracts with less than 10,000 persons per square mile, and 0.5 pounds of nitrogen per household for census tracts with at least 10,000 persons per square mile.

3.   Offsetting the post-development load

The offset of the post-development load must last as long as the load it is offsetting; in most cases, this will require permanent offsets with an assurance that they will be maintained. Examples of permanent offsets are forested buffers that are protected by covenants or easements recorded in the land records, septic systems connected to WWTPs with room under their nitrogen caps, septic systems that are upgraded to best available technology to remove nitrogen, and conversion of dry stormwater management ponds to wet ponds.

The developer must also offset the wastewater load unless the wastewater is treated by a WWTP with capacity under its nutrient cap. If the WWTP does not have capacity under its nutrient cap, it will not be able to accept the wastewater without a modification to its discharge permit. The permit modification will have to document how the load is to be offset permanently.

The developer may undertake to generate offsets on-site or to purchase them from point sources and through Maryland's Trading Market Place or possibly through brokers or aggregators. Offsets generated on site could be used to offset the post-development load or be sold if there is an excess. For example, if a development site receives untreated stormwater from off-site, and treats it for water quality, the development site could conceivably more than offset its own post-development load, producing credits that could be sold on the open market. All credits must be verified.

F. Implementation

1. Effective date

This policy will be implemented through rulemaking, permitting, and the development of markets for obtaining offsets. It is anticipated that the policy will apply to any development that seeks coverage under a General Permit for the Discharge of Stormwater Associated with Construction Activity or applies for an individual Discharge Permit for Stormwater Associated with Construction Activity after December 31, 2014.

2. Applicability.

This policy will apply to Maryland in the Chesapeake Bay Watershed and in the Coastal Bays Watersheds. It will apply to any development that would be required to apply for either a General or Individual Permit for Stormwater Associated with Construction Activity; that is, projects that disturb one or more acres of earth.

3. Regulations and permits.

The Department will propose regulations defining the offset policy and putting it into effect. The Department will also propose either to amend the General or Individual Permits for Stormwater Associated with Construction Activity to incorporate offsets or to adopt a new General Permit for Offsets Associated with Development Activity. The individual or general permit will be the vehicle for identifying the offsets.

As part of the process of filing a Notice of Intent to be covered by the General Permit, or an application for an Individual Permit, the developer will have to calculate the post development nitrogen load and identify the specific verified offsets to be used. These offsets must be legally enforceable by MDE and include enforceable provisions for maintenance of the offsets. The offsets will have to last as long as the post-development load, and it is anticipated that the offsets will be permanent practices. Examples of permanent offsets are forested buffers that are protected by covenants or easements recorded in the land records, septic systems connected to WWTPs with room under their nitrogen caps, septic systems that are upgraded to best available technology to remove nitrogen, and conversion of dry stormwater management ponds to wet ponds.

G. Examples

These post-development load to be offset for these examples was calculated using a spreadsheet that will be publicly available while this policy is being developed. The spreadsheet calculates the load for the entire development and, for residential development, the load per household, assuming the post-development load is distributed equally to each household.

1. A developer wishes to raze an older strip shopping center and construct a mixed use development. The project meets the definition of redevelopment and is served by a municipal WWTP that is operating at ENR and has capacity beneath its nutrient cap. The developer must satisfy all federal, state and local requirements,

including stormwater management, but no offsets for nutrient pollution discharges will be required.

2. The developer plans to build a 50 household residential development on a 12.5 acre parcel connected to a municipal WWTP that is operating at ENR and has capacity beneath its nutrient cap. Using ESD to the MEP and with preserved open space, the development will have 25% impervious, 50% pervious and 25% forest. The developer will have to offset the post-development nitrogen load of 117 pounds unless the parcel is located in a census tract with more than 10,000 people per square miles, in which case the offset would be 92 pounds.

3. Same as 2, except the developer does not cluster the lots. The plans call for a 50 household residential development on a 12.5 acre parcel (quarter acre lots) connected to a municipal WWTP that is operating at ENR and has capacity beneath its nutrient cap. The plans call for 30% impervious and 70% pervious. The developer will have to offset the post-development nitrogen load of 126 pounds unless the parcel is located in a census tract with more than 10,000 people per square miles, in which case the offset would be 101 pounds.

4. Same as 3, except the ENR WWTP does not have capacity below its nutrient cap. The developer will have to offset the post-development nitrogen load of 246 pounds unless the parcel is located in a census tract with more than 10,000 people per square miles, in which case the offset would be 221 pounds. These permanent offsets for the wastewater will have to be documented and specifically required in a modified discharge permit for the WWTP.

5. Same as 4, except the WWTP is operating at BNR efficiency. The developer will have to offset the post-development nitrogen load of 366 pounds unless the parcel is located in a census tract with more than 10,000 people per square miles, in which case the offset would be 341 pounds. These permanent offsets for the wastewater will have to be documented and specifically required in a modified discharge permit for the WWTP.

6. A developer plans to construct a 50 household residential development using ESD to the MEP and BAT septic systems on an agricultural parcel of 150 acres. The plans call for 14% impervious surface, 60% pervious, and 26% forest. The developer will have to offset the post-development nitrogen load of 1060 pounds. In the unlikely event that this 150 acre parcel is located in a census tract with more than 10,000 people per square mile, the offset would be 1035 pounds.

7. A developer plans to construct a warehouse on an agricultural parcel of 30 acres, using Environmental Site Design to the maximum extent practicable and meeting all stormwater and erosion and sediment control requirements. The plans call for 80% impervious surface and 20% pervious surface. It will be served by on on-site BAT system with a capacity the equivalent of 10 EDUs. No nitrogen is assessed for VMT. The total nitrogen offset would be 268 pounds.

H. Next steps

The Department of Agriculture, the Department of Planning and MDE will reach out to counties and other stakeholders during July, August, and early September. Meetings will be scheduled around the State where information about the proposed Accounting for Growth policy will be presented, followed by a question and answer period and an opportunity to submit comments. The Departments are seeking comments on the concepts in the discussion draft, and also on:

- Alternative approaches
- Using nitrogen and not phosphorus or sediment
- Calculating the stormwater load where the development treats a quantity of stormwater different from that required by the stormwater regulations
- Trading geographies
- Use of delivery factors
- Verification and recording of offsets and trades
- Ensuring offsets are permanent
- Use of fees in lieu
- Effective date
- Roles for
  – County Government
  – Aggregators
  – Brokers

Based on the comments, MDE will prepare draft regulations and draft permits. The Departments will brief the Senate Education, Health and Environmental Affairs Committee and the House Environmental Matters Committee in November. In December 2012, MDE will submit the proposed regulations to the Joint Committee on Administrative, Executive, and Legislative Review and the Department of Legislative Services for review before submission of the proposed regulations to the Maryland Register for publication. Following publication, a period for public comment is provided before final Departmental action on the proposed regulation.

Additional information, public meeting dates, and updates to this Discussion Draft can be found on MDE's web page, www.mde.state.md.us or directly at www.mde.state.md.us/programs/Water/TMDL/ChesapeakeBayTMDL/Pages/programs/waterprograms/tmdl/cb_tmdl/index.aspx.