



**DATE:** November 2, 2010  
**TO:** PA DEP Water Planning Office  
**FROM:** Bion Environmental Technologies, Inc.  
**RE: Comments on the Draft Watershed Implementation Plan**

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Bion Environmental Technologies appreciates the opportunity to comment on Pennsylvania's draft Watershed Implementation Plan (WIP). There was clearly a great deal of programmatic detail and specification contained in this document. Bion's distilled comments are described below.

**Summary Statement**

The EPAs Chesapeake Bay model and the DEP WIP both significantly underestimate the nitrogen loadings from livestock. The EPA model compounds the impact of this error by incorporating the unaccounted and misallocated livestock nitrogen loadings into downstream allocation categories such as storm water. The result is a misallocation of major proportions at a cost to the PA taxpayer and local ratepayer of five to twenty times the cost of treating this nitrogen loading at the source. By failing to properly model this impact and direct resources to the source of the problem, the local environmental impacts from livestock waste go unattended and in effect will result in a significant long term cost to PA tax and rate payers since the EPA strategy continues to focus available resources on downstream conduit pathways.

The result is a mandate of unsustainable financial cost based upon a flawed model that will leave the local Susquehanna watershed environment impaired (e.g. sinks such as nitrate contaminated groundwater) while providing only moderate relief in nutrient flows to the Chesapeake Bay. The EPA needs to address this flaw in their model and work with the PA DEP to generate a program that will incentivize the livestock industry to voluntarily participate in solving the Chesapeake Bay's excess nitrogen loadings in an economically sustainable manner. The technologies exist; what is missing is a coherent mix of policy and funding that will focus on solving the excess nitrogen loadings issue in the Chesapeake Bay and not be weighted down with various and sundry social and political agenda items.

That will require a specific overall objective. Bion proposes that a science-based, voluntary incentive program be established that will focus on the generation of real, measurable, permanent and verified nitrogen reductions from unregulated non-point source livestock production facilities be created. This program will include, but not be limited to:

- Science-based models and decisions related to policy.
- An RFP program that will create a market for verified credits on a 'low cost provider' basis. The overall scoring for this program will take into effect the positive benefits of the reductions on the local environment and not solely consider Bay benefits. This approach would replace the existing approach of (1) spreading the pain to all sectors, with particular emphasis on those sources that are regulated, no matter the price, and (2) requiring that all credits get routed through reluctant and heavily regulated municipal waste treatment plants.
- A commitment to policy modifications by both EPA and the DEP that will decrease the price of nitrogen reductions to the taxpayer without environmental backsliding. The approach needs to be a commitment to 'enabling' rather than a commitment to 'regulating'. Technology absent enabling policy will not result in a cost effective nitrogen reduction program to meet the Chesapeake Bay mandate.

Today the country is in a period of constrained financial resources so it is critical that all solutions be measured on a relative cost/benefit basis. A commitment to cost/benefit analysis and appropriate policy modifications can enable technology adoption that will meet or exceed the Chesapeake Bay nitrogen mandated reduction while increasing net family farm income.

**Bion Comment 1:** *The PA WIP plans and requirements are based upon inaccurate data churned out by the EPA watershed model, which errors compound and lead to the inefficient use of financial and technical resources to solve the problem of nitrogen flows to the Bay from the Susquehanna watershed.*

EPAs watershed model, which the PA DEP is mandated to follow for the purposes of Bay clean-up standards, has inaccurately modeled nutrient flows through the Susquehanna Watershed. Bion recently documented this problem, in detail, in a paper titled "Nutrient Trading: Cost Containment - the Missed Opportunity", which can be found at <http://bionpa.com/docs/Nutrient%20Trading%20&%20Cost%20Containment-Sept%202010.pdf>

In summary, EPAs Bay model:

- (1) Does not accurately account for the entirety of nitrogen that is generated, and lost to the environment, from livestock manure. On average, half of the nitrogen

in manure is volatilized as ammonia prior to land application. The Bay model does not fully account for, and also incorrectly categorizes, this ammonia nitrogen into downstream categories such as stormwater and forests. Mr. Paul Lyskava, Executive Director of the Pennsylvania Forest Products Association and commenter at the PA DEP WIP hearing in Lycoming County, stated that nearly all of the nitrogen delivered load from forests is caused by air deposition. EPA staff responded that this deposition is caused by NO<sub>x</sub> deposition from power plants and other regional/national combustion activities, and that additional Clean Air Act (CAA) regulation will solve the problem. What EPA missed was (a) recognition of the massive amounts of near field ammonia nitrogen deposition from the livestock within the Susquehanna, (b) that this massive amount of nitrogen is not accounted for in EPA's model as being generated from livestock waste, and (c) ammonia nitrogen is unregulated and therefore adaptations to the CAA will not reduce this deposition load.

- (2) Categorizes agricultural nutrient loss either to CAFOs or cropping. Almost all of the nutrient losses therefore are categorized as cropping, as CAFOs are regulated as 'zero discharge' facilities. The problem is that since almost all losses from agriculture are categorized as associated with cropping, the majority of technical and financial resources are spent on best management practices (BMPs) designed to reduce cropping losses. However, as noted above, approximately 50% of all livestock manure nitrogen is lost prior to the cropping application of manure. It is unclear how EPA models this loss, if it does at all. Further, based upon descriptions in the draft WIP, it is also unclear if EPA and/or DEP models include nitrogen release from the entirety of livestock populations or just the portions from larger regulated or permitted herds.

These model inaccuracies have a profound negative impact on Susquehanna watershed ratepayers, and taxpayers statewide because:

- (1) As the EPA model results point to addressing downwind/downstream and expensive to treat stormwater in addition to cropping losses, financial resources that could have been more efficiently applied to treating the nitrogen loss at its source are applied to the most expensive treatment option. The Susquehanna watershed in particular is susceptible to this type of resource mismanagement as the predominant portion of nitrogen delivered load is from livestock and not large population centers as are found in other parts of the Chesapeake Bay watershed.
- (2) Local tax/ratepayers also suffer as the focus of remediation from EPA's model is on sources that directly deliver nutrient load to the Bay, which in this case happens to minimize local watershed benefits, even though the local ratepayers are required to fund their portion for the Bay remediation. Much more cost effective, and locally beneficial, would be to treat the nitrogen loss at the source,

which will provide a much wider array of environmental benefits to the local community, including additional phosphorus reductions benefiting the local freshwater streams and reductions in odors, pathogens, and other related impacts from excessive livestock manure.

**Bion Comment 2:** *The WIP seeks to promote the application of technologies to address the primary source of the problem: livestock manure in the Susquehanna watershed. Renewable energy benefits can accrue from this approach.*

As DEP articulated in the WIP, strategically configured public policies can accelerate the development and application of new market-based technologies designed to address environmental challenges. For example, Bion is in the process of constructing a nutrient management facility at the Kreider Dairy Farm in Manheim, PA. With its initial phase of operations, Bion will be treating the manure from 1,200 milk cows, which generate the equivalent amount of nitrogen as about 38,000 people. However, the comparisons to municipal waste treatment end there, as Bion is able to efficiently remove the nitrogen from the concentrated waste stream at a fraction of the cost to remove nitrogen from a dilute municipal waste treatment facility while simultaneously enhancing nutrient uptake when applied for crops. This difference in treatment concentration is key. Bion can reduce nitrogen from the livestock manure stream at a fraction of the cost it takes municipalities to remove far more diluted nitrogen from stormwater or treatment plants.

Furthermore, unlike the case with government funded agricultural best management practices, Bion (and any other technology provider) is required to generate credits which can fully meet established standards for environmental credits--- they must be real, additional, measurable, permanent, unique (not double-counted), and independently verified through a DEP approved nutrient credit verification plan. And, most importantly from a nutrient credit standpoint, they can be offered on a long term, continuous basis.

Another benefit associated with treating livestock waste is the ability to generate renewable energy as a by-product of livestock waste treatment technologies, such as with the Bion and EnergyWorks projects. As was discussed in Secretary Hanger's October 27th meeting on the potential for a federal technology implementation fund, livestock waste treatment technologies generate revenue from both the sale of nutrient credits as well as producing a homogenous renewable energy feedstock, significantly improving the economic and environmental sustainability of these projects. This combined benefits approach is significantly different than the traditional anaerobic digestion proposals that require subsidies to support their economic sustainability due to their singular renewable energy revenue stream (and inability to efficiently remove nitrogen and other nutrients).

Bion believes that a key component of a technology implementation fund would be a component to enable verified credits to be 'monetized' to fund the required capital investment. Bion believes a Request for Proposal (RFP) program that would enable technology project developers to compete on a low cost basis to pre-sell their credits, and therefore use such off-take contracts to finance their projects in the private capital markets, would be a critical component of any technology implementation fund. Such an RFP program would be in addition to the existing nutrient trading programs because it would be focused on acquiring large quantities of verified credits primarily for future delivery.

**Bion Comment 3:** Policy modifications are required to create a workable, voluntary, incentive-based program that would allow livestock producers and project developers to partner to deliver to the taxpayer an affordable verified large volume of nutrient credits to meet the EPA Chesapeake Bay mandate. Existing policies that govern trading programs were largely created to be applied to heavily regulated municipal waste treatment plants and, to some minor extent, other regulated sources. In order for credits to be generated from unregulated non point sources that elect to voluntarily participate in such a program, which comprise situations that lack direct financial backing of taxpayer assistance and ratepayer revenue streams, modifications in policy are needed to enable investments from private capital.

Absent such policy modifications, an affordable solution cannot be achieved from these unregulated sources. Please refer to Bion's more detailed description of the recommended voluntary program to optimize low cost yet verifiable nitrogen reductions at <http://bionpa.com/docs/Nutrient%20Trading%20&%20Cost%20Containment-Sept%202010.pdf>