



# ***Producing and Selling Credits in Maryland's Nutrient Trading Market***

## **Guidance for Agricultural Producers and Landowners in the Chesapeake Bay Watershed**



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# Introduction

Restoring the Chesapeake Bay is a great challenge to Maryland's citizens and its state, county, and local governments. While Maryland has significantly reduced the amounts of nitrogen and phosphorus entering the Bay, even more substantial reductions must be made to reach the levels, or loading caps, that will produce an ecologically healthy Bay. The Chesapeake Bay Total Maximum Daily Load (TMDL) established by the U.S. Environmental Protection Agency (EPA) calls for additional reductions in nitrogen and phosphorus loads from wastewater treatment plants, septic systems, urban stormwater, agricultural operations, and the atmosphere.

Once Maryland achieves these load caps, maintaining them may prove to be as challenging as achieving them, especially since the Bay TMDL provides no allocation for the discharge of nutrients from new or expanding wastewater treatment plants of any size. Management of existing caps and the accommodation of continued economic and population growth will require dischargers and developers to use a number of possible options, including the purchase of offsets or credits generated by load reductions elsewhere. The nitrogen and phosphorus load reductions that serve as the basis for credits traded in the nutrient marketplace will come largely from agricultural operations. The prevention or reduction of nutrient runoff and emissions from agricultural lands creates opportunities for farmers and other landowners to generate credits and sell them in the nutrient trading market.

This guidance document is written for farmers and landowners who may be interested in Maryland's nutrient trading program. It first presents background information on Maryland's Chesapeake Bay restoration program, the role of nutrient trading in the restoration effort, and Maryland's development of a nutrient trading policy. It then introduces the general features and requirements of Maryland's trading policy, explains how the nutrient trading market works and how to participate, and describes the step-by-step process to produce credits and implement a trade.

## Restoring the Chesapeake Bay

### Goals and Strategy

The Chesapeake Bay is the nation's largest estuary and one of the most complex ecosystems in the world. The Bay's vast watershed stretches across more than 64,000 square miles and encompasses parts of six states and the entire District of Columbia. The health of the Bay and its ability to support the habitat and populations of many once thriving species have declined dramatically over the past 50 years because of increasing pollution from the nitrogen, phosphorus, and sediment entering its waters. These pollutants come from direct discharges from point sources, such as wastewater treatment plants, and diffuse nonpoint sources, such as agricultural and urban runoff, as well as atmospheric deposition. Achieving and sustaining the

improvements in water quality necessary to protect and restore the Chesapeake will require drastic reductions in the amounts of nutrients entering the waters of the Bay and its tributaries from all sources.

Since the creation of the Chesapeake Bay Program in 1983, partner states and entities have signed a series of accords establishing loading goals and other initiatives intended to reduce pollution of the Bay. The 1987 agreement, which was unprecedented at the time, set the first defined numeric goals in the nation and committed the signatories to reducing controllable nutrient by 40 percent from 1985 levels by the year 2000. These targets were reconfirmed in the 1992 Amendments extending Bay Program efforts to the Bay's tributary systems and instituting tributary-specific reduction and maintenance strategies. In 2000, the partners in the Bay Program renewed their commitment to restoring the Bay and outlined a comprehensive vision for the next decade and beyond.

Following the signing of the Chesapeake 2000 Agreement, Maryland and Virginia adopted new water quality standards for the Bay, and the Bay Program undertook additional analysis and water quality modeling to determine the maximum annual nitrogen and phosphorus loads required to achieve those new standards. The resulting loads were then apportioned to the states, and Maryland's nitrogen and phosphorus allocations reflected a further reduction in annual loads of close to 60 percent from the 1985 baseline. Maryland detailed plans for achieving these necessary load reductions for each of the State's ten major watersheds in documents called Tributary Strategies. In 2004, Maryland revised its nutrient reduction strategies, collectively re-named the "Maryland Tributary Strategy," and identified measures necessary to decrease loads and achieve the specified allocations.

Over the preceding years, the Bay restoration efforts were largely voluntary and coordinated by the states located in the Chesapeake Bay watershed. In 2009, however, directives contained in an Executive Order issued by President Obama gave the federal government a leadership role in the Bay's restoration and protection and outlined a process for revising regulations, programs, and policies to facilitate the development of tools and strategies to bring the Bay and its tributaries back to health. To meet the commitments made in that Executive Order, the EPA has worked with individual Bay states to develop Watershed Implementation Plans (WIPs) that describe how and when the states will meet their allocations under the Bay TMDL announced at the end of 2010.

Now the focus has shifted to the implementation of Phase II WIP pollution reduction targets through two-year milestones and the adoption of plans to address loads from increased population growth and new development. The EPA has oversight responsibilities for the progress of Bay state jurisdictions toward the ultimate goal of restoring the waters of the Bay and its tidal waters by 2025, and the agency could further tighten regulatory enforcement. Whatever the future holds, the successful achievement of Bay cleanup efforts will not be easy or inexpensive, and will certainly require some degree of sacrifice from all segments of society.

# **The Role of Nutrient Trading in Maryland's Strategy**

## **The Development of Nutrient Trading Policy**

Water quality trading offers an innovative option for addressing water quality problems. It is a market-based approach that can realize increased efficiency and cost-effectiveness in achieving watershed goals as well as accommodate additional growth under the constraint of load caps. In its most common form, a trading program allows one source, such as a wastewater treatment plant, to meet its permit obligations by purchasing pollution reduction credits from another regulated source, such as a second wastewater treatment plant with lower reduction costs, or from an unregulated nonpoint source, such as an agricultural operation. It can also help create financial incentives for nonpoint sources to undertake reductions in order to participate in the market.

At the national level, the Environmental Protection Agency (EPA) has worked since the early 1990s to promote the use of water quality trading to help meet water quality goals. In 2003, the EPA issued national trading policy guidelines delineating the purpose and potential benefits of trading, along with common elements deemed essential to the development of credible, sustainable trading programs. The Chesapeake Bay Program has also been a long-standing proponent of the application of water quality trading to the Bay's nutrient-reduction challenges. Following a sixteen-month stakeholder process, the Bay Program established an organizing and policy framework for program partners with the publication of "Nutrient Trading Fundamental Principles and Guidelines" in 2001.

In January 2008, the Maryland Department of the Environment (MDE) issued a policy document entitled "Maryland Policy for Nutrient Cap Management and Trading in Maryland's Chesapeake Bay Watershed." This document represented the initial phase (referred to as Phase I) of the State's nutrient trading policy development. It describes the purpose and form of nutrient trading in Maryland and sets forth the fundamental principles and guidelines that Maryland will require trading programs to follow. It also spells out the requirements and procedures for nutrient trades between wastewater treatment plants (called point source to point source trading). With the release of Phase I policy, wastewater treatment plants could begin requesting approval for trades with other wastewater facilities.

During the development of Phase I, it was recognized that trading between point and nonpoint sources, such as agriculture, presented some unique issues. Therefore, a second stage, or Phase II, was initiated with the Maryland Department of Agriculture (MDA) taking the lead in policy development. An advisory committee was formed with representation from a cross section of public and business interests to provide guidance and feedback to MDA as it developed the policy. Members of the committee are listed on the "Acknowledgments" page.

The requirements and procedures for point and nonpoint agricultural trading were issued in two

draft documents: *Maryland Policy for Nutrient Cap Management and Trading in Maryland's Chesapeake Bay Watershed, Phase II A—Guidelines for the Generation of Agricultural Nonpoint Nutrient Credits*, and *Phase II B—Guidelines for Agricultural Nonpoint Credit Purchases*. These materials constitute proposed state policy.

This document, *Guidance for Agricultural Producers and Landowners in the Chesapeake Bay Watershed*, is based on the Phase II A policy documents and is intended to be an introduction and guide for agricultural and other nonpoint sources who may wish to sell nutrient credits to point sources and other interested buyers. It does not replace the draft policy documents cited above.

## **Role of Nutrient Trading in Maryland**

In the development of its Nutrient Trading Program, the State of Maryland defined the role of water quality trading as an offset and load reallocation policy to accommodate growth under a loading cap. Nitrogen and phosphorus loads cannot be allowed to start increasing again, even in the face of continued population and economic growth. To maintain the caps, the TMDL provides no allocation for the discharge of nutrients to new or expanding wastewater treatment plants. One way continued urban population growth can be accommodated is to establish a nutrient trading marketplace where load reductions achieved elsewhere serve as the basis for nutrient credits that could be sold to developers required to completely offset their increases in nutrient discharges.

The Tributary Strategy called for the largest of Maryland's major wastewater treatment plants to be upgraded to Enhanced Nutrient Removal (ENR) capability through the Chesapeake Bay Restoration Fund, which finances capital costs from fees paid by treatment plant users (the so-called "flush tax"). Consequently, Maryland policy does not allow *trading to achieve the cap*, i.e., allowing wastewater treatment plants to purchase credits instead of upgrading to ENR levels. This provision represents a key difference with other trading programs in both the country and other Bay states and means that most nutrient trading transacted in Maryland will be to accommodate growth.

## **General Features and Requirements**

In developing trading policies, some fundamental principles were adopted. These principles, as they apply to trades involving nonpoint source agricultural credit sellers, are shown in Table 1 on the next page and serve as the basis for the rules, requirements, and procedures of Maryland's nutrient trading program.

**Table 1. Fundamental Principles for Nutrient Trading in Maryland**

1	A generator of agricultural nonpoint source credits must first demonstrate that baseline water quality requirements have been met. These requirements are the more stringent of either the nutrient reduction requirements outlined in the Bay Total Maximum Daily Load (TMDL) for each watershed or the local TMDL that has been adopted for an impaired waterbody.
2	Agricultural credit generators must be in compliance with all applicable local, state, and federal laws, regulations, and programs. Nutrient trades cannot cause nor contribute to violations of water quality standards in local waters, downstream, or in the Chesapeake Bay.
3	Best management practices (BMPs) that are funded by federal or state cost-share or county mitigation banking programs cannot be used to generate nutrient credits during the specified life-span of the BMP.
4	The trading program is not intended to encourage and accelerate the loss of productive farmland. Therefore, credits cannot be generated by taking whole or substantial portions of farms out of production for the sole purpose of generating credits.

5	Trades must result in a net decrease in loads. To ensure this net decrease is achieved, 10 percent of the agricultural credits sold in a trade will be “retired” and permanently applied toward TMDL goals. The buyer will retire the credits following the transaction, and this determination should be reflected in the buyer/seller contract.
6	An agricultural practice or BMP can generate credits only when it is installed or is placed in operation.

A number of specific requirements flow from these principles. They are organized into the categories shown in Box 1. These requirements can help as well to organize the steps that must be taken in order to sell nonpoint source credits on Maryland’s nutrient trading market. The following section not only describes the requirements in detail, but also presents step-by-step instructions that can be used to determine eligibility and potential ability to generate credits, certify and register credits, find trading partners and execute contracts, obtain approval for trades and register them, and annually verify the credits sold.

#### **Box 1. Trade Requirement Categories**

- Trading eligibility
- Baseline requirements
- Credit generation
- Required trading ratios
- Credit certification
- Trade execution
- Trade approval
- Annual credit verification

## **Planning and Implementing a Nonpoint Source Trade**

### **Step 1. Determining Your Eligibility to Sell Nonpoint Source Credits**

The Trading Policy states that the following individuals or entities may generate credits to sell on the trading market:



- Any generator of nonpoint source loads, including farm owners, landowners, and/or renters or lessees who can demonstrate permission by the landowner to generate and sell credits
- Parties or entities engaged in removing nutrients from the environment
- Maryland state entities
- Aggregators<sup>1</sup>

In addition to being in one of these categories, you must also be in compliance with all applicable federal, state, and local laws. Participating agricultural operations must have a current Nutrient Management Plan and an updated Soil and Water Conservation Plan that includes, if appropriate, a Waste Management System Plan.

## **Step 2. Determining Your Baseline Requirements**

The trading program requires an agricultural operator or landowner to first achieve a certain level of nutrient reduction known as a “baseline” before generating credits to sell. In essence, you must first achieve reductions sufficient to meet either the Bay TMDL requirements or the local watershed TMDL and then make further reductions in order to generate credits for sale. Baseline requirements provide assurance that all participants are at a minimum level of conservation stewardship that is needed to protect and restore the Bay.

Crop and pasture lands must meet a performance-based baseline which is expressed as an annual nitrogen or phosphorus per-acre loading rate and established by the TMDL goal for cropland. The TMDL loading goals vary by watershed, so the baselines vary by watershed as well. Confined animal operations must meet a practice-based baseline in order to be eligible to trade. The baseline is met if the operation has a Nutrient Management Plan, a Soil and Water Conservation Plan, and an adequate manure storage and runoff system, or in the case of a Confined Animal Feeding Operation (CAFO), a Comprehensive Nutrient Management Plan (CNMP).

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<sup>1</sup> Aggregators are entities that buy credits from a number of suppliers and then package and resell them. The trading program requirements for aggregators are not described in this guidance. Parties interested in these requirements should refer to the full Phase II-A document.

You will need to first determine whether your farm meets baseline, before calculating nutrient credits eligible for sale. To do this, you can use the Maryland Nutrient Trading Tool, which is an online credit estimation tool found on the Maryland Nutrient Trading Program website ([www.mdnutrienttrading.com](http://www.mdnutrienttrading.com)). The baseline requirements for your watershed have been built into the credit estimation tool. The website also contains guidance for utilizing the credit estimation tool as well as information on Maryland's nonpoint source nutrient trading market. See the "Maryland Nutrient Trading Program Website" section after Step 9 for further details.

Note that the entire tract, in aggregate, must achieve baseline before it qualifies to generate credits. For crop and pasture fields, this means that the collective sum of loads from all fields needs to be less than the tract's baseline requirement. Any animal confinement areas also need to also be in compliance with the practice-based requirements in order for the whole tract to meet baseline. A combination of agronomic and structural practices can be utilized to meet baseline. If you have already installed BMPs, they may be sufficient to achieve the baseline; if not, you will need to install additional BMPs or take other actions to reduce your load.

You may use federal and state cost-share programs to implement the BMPs that you use to meet the baseline nutrient reduction requirements. You **cannot** use BMPs funded by state and federal cost-share or county mitigation banking programs to generate credits to sell. However, after the funded lifespan of a structural practice has expired, you can use the full BMP to generate credits through a recertification process.

Nitrogen and phosphorus baselines are handled individually. If baseline is met for one nutrient, credits can be generated and traded for that nutrient even if the other nutrient does not meet baseline.

### **Step 3. Determining Your Ability to Generate Credits**

Once you have determined that your agricultural operation has met, or will be able to meet, the baseline requirement for your watershed, the next step is to determine which additional actions you can implement in order to achieve additional load reductions to sell as credits. Tradable credits can be generated from any existing or planned agronomic, structural, or land conversion practice which you can show has or will result in additional reductions.

Agronomic practices, such as cover crops, conservation tillage, manure injection, reductions in nitrogen fertilizer application, and precision agriculture, reduce or minimize nutrient loss to surface or groundwater or the air and can generate credits. Since these practices are considered to be annual in nature, they must be done every year in order to continue generating credits. Structural practices, such as grassed waterways, riparian buffers, fencing, and constructed

wetlands, can also generate credits. These practices can generate credits over multiple years as long as they are properly maintained.

Conversions of agricultural land to less nutrient-intensive use can be used to generate credits as well. Examples include the installation or restoration of forest or grass buffers, or wetlands, retirement of highly erodible lands, and conversion to alternative or perennial crops. Since MDA does not wish to encourage the removal of whole farms or substantial portions of farmland from production for the sole purpose of generating nutrient credits, applications for certification of credits that do so will not be approved.

There are several credit timing considerations you should be aware of in your planning:

- A practice can only generate credits once it is installed and functioning.
- Because practices may be installed at different times during the year, the full number of estimated annual credits produced by the practice will not be certified until the year following the year of installation.
- Credits may be used by buyers only in the same year in which they are generated. Credits cannot be banked for sale and used in future years. For example, if an agricultural BMP generates an average of 100 credits per year and has a life span of five years, 500 credits cannot be sold in the fifth year. (Please note that this provision does not prevent the sale of credits for future years. In the above example, the farmer might contract with a buyer to sell all 500 credits upfront, but the buyer can still only use 100 credits per year for each of the five years.)

For many BMPs and other agronomic practices (collectively referred to as BMPs in the remainder of this document), the nitrogen and phosphorous load reductions they achieve (i.e., their nutrient-removal efficiencies) have been scientifically assessed, peer reviewed, and incorporated into the Bay models. Thus, the credit generation capability has already been established for these BMPs. The Phase II Policy incorporates this work and divides possible BMPs into three categories:

- *Category 1 – BMPs with Approved Load Reduction Efficiencies.* These are BMPs that are currently in widespread use in the Chesapeake Bay watershed. They have well-documented installation and maintenance specifications, and well-established and understood nutrient removal efficiencies. They have been put through a rigorous scientific peer review by the Chesapeake Bay Program and their efficiencies have been incorporated into the Bay Program nutrient loading and water quality models. Since the efficiencies are long-term averages, you do not need to consider seasonal or annual variability in BMP performance in estimating your credits.
- *Category 2 – BMPs Requiring Technical Review.* These are BMPs that are also currently in use in the Chesapeake Bay watershed but they may still require additional scientific analysis and technical review before standardized performance efficiencies can be assigned.

- *Category 3 – Other BMPs.* These are new technologies or innovative practices that are not yet in widespread use. Since reliable estimates of their nutrient removal performance capabilities may not exist, they will be subject to scientific analysis and technical review to evaluate and determine efficiencies and load rates before any credits can be assigned.

BMPs currently contained in these three categories are shown in Table 2 on the next page.

The use of BMPs in Category 1 can greatly simplify credit generation calculations. The approved load reduction efficiencies are built into the Maryland Nutrient Trading Program website so you can evaluate different scenarios by simply selecting a BMP or set of BMPs. The credit estimation tool on the website will automatically apply the appropriate efficiencies and tell you the number of credits generated in that scenario.

Category 1 BMPs have an added advantage in that you do not need to apply an “uncertainty” ratio to your trade (trading ratios are described in the following section). Any uncertainty associated with the BMP has already been taken into account by the Chesapeake Bay Program in the adoption of the stipulated efficiency.

Category 2 BMPs do not have well-established nutrient reduction efficiencies and are under peer review and awaiting approval by the Chesapeake Bay Program. Credit generation or trade proposals involving them will require review by an independent technical panel established by MDA. The panel will set the efficiency and loading rates to be used in the trade, along with an appropriate uncertainty ratio.

Category 3 BMPs are largely new or untested and lack even estimated nutrient reduction efficiencies. If you intend to use any BMP in this category, you will need to submit a credit proposal that includes specifications for project installation, operation, maintenance, and monitoring. Credit generation proposals involving these practices will be examined by MDA and the technical panel, and an appropriate uncertainty ratio will be applied. The approval process for these credits will likely take longer than that for proposals involving Category 2 credits.

**Table 2. BMPs by Chesapeake Bay Program Category**

<b>Category 1 BMPs with Approved Load Reduction Efficiencies</b>	<b>Category 2 BMPs Requiring Technical Review</b>	<b>Category 3 Other BMPs</b>
Riparian/Conservation Forest Buffers	Algal Turf Scrubber	Other Innovations
Riparian/Conservation Grass Buffers	Oyster Aquaculture	
Wetland Restoration	Phosphorus Sorbing Materials	

Tree Planting*		
Carbon Sequestration/ Alternative Crops*		
Cover Crops		
Commodity Cover Crops		
Conservation Plans		
Barnyard Runoff Control		
Loafing Lot Management		
Water Control Structures		
Erosion and Sediment Control†		
Conservation Tillage*		
Animal Waste Management Livestock		
Animal Waste Management Poultry		
Mortality Composters		
Stream Restoration		
Prescribed Grazing		
Stream Access Control with Fencing*		
Alternative Watering Facility		
Horse Pasture Management		
Decision Agriculture		
Continuous No-till		
Enhanced Nutrient Management†		
Ammonia Emissions Reduction†		
Dairy Precision Feeding and Forage Management†		
Nutrient Management Applications†		
Poultry and Swine Phytase†		

\*Credited as a land use change

†Credited as an application reduction

## Step 4. Applying Trading Ratios

A trading ratio is a mathematical adjustment made to the number of pound of nitrogen or phosphorus leaving a farm (edge of field) or being discharged by a wastewater treatment plant. Different types of trading ratios are imposed for different reasons, and one or more may be required in a given trade. The types of trading ratios that are used in the Maryland trading program are explained in Box 2 on the next page.

For nonpoint sources, two types of delivery ratios are applied: the edge of stream ratio and the in-stream delivery ratio (see Box 2 for more information). In addition, a 10 percent retirement ratio will also be applied to credits at the time of trade. The Maryland Nutrient Trading Tool, which estimates your credit generation potential, will automatically apply the appropriate delivery ratios and the retirement ratio.

If you intend to use BMPs in Categories 2 or 3, an uncertainty ratio may also be applied. MDA and the technical panel will set this ratio in the review of your credit certification request. Unlike delivery or retirement ratios that are expressed as fractions, uncertainty ratios are expressed as actual ratios. For example, an uncertainty ratio of 2:1 means that 2 pounds of edge-of-field reductions are required to generate 1 credit.

## **Box 2. Trading Ratios Used in Maryland's Nutrient Trading Program**

### **Delivery Ratio**

When a pound of nitrogen or phosphorus from your farm enters the nearest stream, not all of it reaches the mainstem of the Chesapeake Bay, i.e., is “delivered.” How much of that pound actually reaches the Bay depends on many factors, with distance being the most important one. TMDL goals are expressed in terms of delivered loads, and the delivery ratio is used to simulate the physical and biological processes that affect nutrient loads as they travel downstream. Thus, a pound of nitrogen or phosphorus released in an upper watershed has less impact than a pound of either released at the mouth.

The delivery ratio that is applied is based on location in the watershed, and it is actually comprised of two types of ratios:

- **Edge of Segment Delivery Factor (EOS)** – The EOS Factor represents an adjustment between the edge-of-field nutrient load as calculated by USDA's national Nutrient Tracking Tool (NTT) and the edge-of-segment load as defined by the Chesapeake Bay Watershed Model. The edge-of segment load is the amount of nutrients expected to reach the surface waters at the boundary of the watershed model segment through surface runoff, groundwater flows, or atmospheric deposition.
- **In-Stream Delivery Factor (DF)** – The DF represents the pollutant effect of the nutrient reductions between upstream and downstream points and is largely the function of the distance from the edge of the watershed model segment to the Bay. This factor is derived directly from the Chesapeake Bay Watershed Model.

### **Uncertainty Ratio**

Uncertainty ratios are used to compensate for possible discrepancies in the relationship between credit generation models and actual pollution reductions resulting from various BMPs. They are needed when sufficient data do not yet exist to determine BMP efficiency or actual nutrient loads or reductions cannot be accurately measured. The application of an uncertainty ratio essentially provides a margin of safety to ensure that water quality goals are being met.

### **Retirement Ratio**

A retirement ratio represents a percentage of the total amount of credits sold that cannot be used by the buyer. These credits are considered to be “retired” and, thereby, create a greater reduction in nutrient loads than that which would have occurred without the trade. In Maryland agricultural nonpoint trading policy, the retirement ratio has been set at 10 percent and applies to all credit sales.

Box 3 on the next page illustrates how the delivery and retirement ratios are included in the credit calculations. Two scenarios are shown to demonstrate the ways in which differences between the buyer's and seller's delivery ratios can dramatically alter the number of credits sold. Note that credits determined by the retirement ratio will be retired by the buyer after the transaction has occurred.

### Box 3. Illustration of the Application of Trading Ratios

This example of applying delivery and retirement ratios shows two scenarios, one where the seller has a delivery ratio of 0.58 and one where he has a delivery ratio of 0.80. A higher delivery ratio means the seller is closer to the mainstem of the Bay. A substantially different number of credits is generated under the two scenarios.

Delivery ratio example		
	Scenario 1	Scenario 2
Eligible Reductions	1000	1000
<b>Delivery ratio</b>	<b>(x) 0.58</b>	<b>(x) 0.80</b>
Credits available to sell	(=) 580	(=) 800

An additional factor also affects the number of credits that can be sold to a buyer. Assume that the buyer requires 500 credits. A 10 percent retirement ratio requires 550 credits to be exchanged in the transaction. The extra 50 credits will be retired by the buyer after the transaction occurs. This determination should be spelled out in the sales contract.

Retirement ratio example	
Credits sold	500
Retirement ratio (10%)	50
Total credits needed	550

## Step 5. Getting Your Credits Certified and Approved

Your first step in getting your credits approved and certified by MDA is to complete and submit a Maryland Agricultural Nutrient Credit Certification and Registration application form (CCR form). The CCR form can be downloaded from the Maryland Agricultural Nutrient Trading website ([www.mdnutrienttrading.com](http://www.mdnutrienttrading.com)). A copy of this form can be found in Appendix B. Applications should be mailed to:

Maryland Department of Agriculture  
Resource Conservation Operations  
Attention: Nutrient Trading Program  
50 Harry S. Truman Parkway  
Annapolis, MD 21401

If you use the website credit calculator tool, the required information and data are automatically added to your form, which can be printed for submittal. A number of partners, including staff in



your local Soil Conservation District, are available to assist you in assessing your potential to participate in the nutrient trading market.

If you are proposing to use BMPs from Categories 2 or 3, you will also need to submit detailed information on them and their projected performance. As described above under Step 3, MDA will convene a technical panel to review and approve the load reduction values that you propose. In addition, more information or an onsite examination prior to approval of your application may be required. In some cases, MDA may require direct monitoring to ensure the load reductions are met, or MDA could require that additional obligations be added to the contract between you and your buyer. All back-up documentation for the application will be maintained for a minimum of 10 years.

MDA will review all applications to verify that:

- Baseline requirements are met
- Credit calculations are correct
- Conservation compliance requirements are met
- Credit generation proposal is reasonable
- The landowner/operator has consented
- Necessary USDA/FSA tract information has been provided

MDA or its representative will conduct a field visit to verify baseline requirements are met and the credit generation proposal is appropriate. Following the review process, the CCR application will be approved by MDA and the credits certified. The credits will be given a unique registration number and entered into Maryland's online Trading Registry.

## **Step 6. Finding a Buyer for Your Credits**

Maryland has designed its Nutrient Trading Program to function as an open market as much as possible. The trading policy defines the traded commodity, ensures proper functioning of the market, and requires public recording of trades and credit use. Beyond that, however, market participants can find each other in any manner they choose and are largely free to negotiate the terms of their trades. Contractual arrangements between potential buyers and sellers can be negotiated at any time, before or after credit certification.

To assist those interested in participating in the market, MDA has set up the Maryland Nutrient Trading Program website ([www.mdnutrienttrading.com](http://www.mdnutrienttrading.com)). The website, which is described in some detail following Step 9, features a marketplace and a central trading registry that will provide public transparency of trading activity.

The online marketplace will serve as a convenient and up-to-date location to assess activity in the market and to find potential trading partners. If you choose to use the marketplace, you can set up an account and use it to post registered credits and manage offers from buyers. Whether or

not you use the credit estimation tool or the marketplace, your certified credits will be recorded in the online trading registry, along with any trades you make.

It is important to note that different buyers will have different needs. For example, some buyers will require short-term compliance credits while others, such as new or expanding dischargers, may require contractual arrangements for 10 years or longer.

## Step 7. Executing a Trading Contract

You may sell credits directly to regulated point sources or to conservation buyers. You may also sell credits to an aggregator who then may resell them. Whatever your choice, you must execute a legally enforceable contract with the buyer. The contract terms may differ depending on the buyer's category. The trading policy sets forth minimum requirements for each type of buyer/seller contract in Box 4.

### **Box 4. Required Elements for Nutrient Trading Contracts**

#### **Contracts between Credit Generators and Regulated and Non-Regulated Credit Users**

- Identification and contact information of the parties, with signature
- Location of credits
- Duration of the contract in years
- Quantity of credits to be exchanged in each year of the contract
- Methods of credit generation
- Credit prices
- Obligations of the seller, including agreement to:
  - Properly maintain BMPs or other specified facilities
  - Allow regular inspections
  - Comply with all applicable federal, state, and local requirements
  - Continue to meet and maintain baseline compliance
- Obligations of the buyer, including agreement to:
  - Perform required annual or biannual inspections through a certified third party
  - Provide annual inspection report to MDA and/or MDE
  - Purchase additional credits necessary to meet mandated 10% retirement ratio
- Provisions for violation of the contract terms, including monetary compensation and delivery of alternative credits

#### **Contracts between Credit Generators and Credit Aggregator**

- Identification and contact information of the parties, with signatures
- Location of credits
- Duration of the contract in years
- Quantity of credits to be exchanged in each year of the contract
- Method of credit generation
- Credit prices
- Obligations of the seller, including agreement to:
  - Supply sufficient credits in full accordance with the trading policy
  - Insure that BMPs or other facilities needed to generate the credits are properly operated and maintained
  - Comply with all applicable federal, state, and local requirements
- Obligations of the buyer, including agreement to:
  - Perform required annual or biannual inspections through a certified third party
  - Provide annual inspections report to MDA and/or MDE
  - Make prompt payment based on contract provisions
- Provisions for the violation of contract terms, including monetary compensation and delivery of alternative credits

While the use of standardized contracts is not required, your contract must follow a format consistent with the elements shown in Box 4. You can add further elements and requirements to a contract to address other preferences you or the buyer may have. These additional provisions, however, cannot be in conflict with the stated contractual requirements. Any additional provisions outside of those required do not need to be submitted with the trade application and can remain confidential if you wish.

In designing your contracts, you should make sure that you understand the liability issues involved for you as well as the buyer. Most of the demand for agricultural credits is likely to come from wastewater treatment plants or developers. Trades with them will be incorporated into their discharge permits and become permit requirements. Under the Clean Water Act (CWA), the permit holder will remain solely responsible for meeting the permit requirements, and any CWA enforcement action will be taken against that entity. This liability cannot be transferred to the credit seller even if the seller causes a violation by not generating the agreed-upon number of credits. For this reason, regulated buyers are likely to insist on contract provisions that require the seller to cover all of the buyer's financial liability caused by a default by the seller.

Contracts for sales to non-regulated buyers, such as conservation organizations and aggregators, must also contain provisions for violation of the contract terms. MDA does not impose specific provisions or requirements for contract violations but instead leaves them to the trading parties to determine.

For either type of contract, it is recommended that you have your proposed contract reviewed by legal counsel before signing it.

## **Step 8. Getting Your Trade Approved**

A trading application form can be completed online and downloaded from the Maryland Agricultural Nutrient Trading website ([www.mdnutrienttrading.com](http://www.mdnutrienttrading.com)). A copy of this form can also be found in Appendix B. Applications for trade approval must provide specific information about the proposed trading arrangement, including:

- The time period for the trading arrangement
- The number of credits to be purchased each year during this period
- How the number of required credits to be exchanged was determined
- Source of credits
- The general contractual arrangements (See Box 4 for the full list of contractual information that must be included in the contract.)

A copy of your approved Maryland Agriculture Nutrient Credit Certification and Registration form must be included in the application. If the buyer is a regulated source, the application for approval of the trade will be submitted by the buyer to the Maryland Department of the Environment (MDE). The application is essentially a request by the buyer that MDE modify its NPDES permit to incorporate the trade. If the buyer is not a regulated NPDES discharger, the application will be submitted by the buyer to MDA. Addresses for MDE and MDA are on the application form on the website.

Upon satisfactory review of the trade, it will be entered into the online Trading Registry. If there are any missing elements, the application will be returned to the applicant for revision.

## **Step 9. Annual Verification**

All trading contracts will require annual credit verification and reporting. For credits generated by annual practices, such as cover crops, inspections will be required a minimum of twice during the annual life. For credits generated by structural BMPs, inspections are required once per year.

In both cases, the inspections must be done by independent third parties such as personnel from a local Soil Conservation District. In addition to the third-party inspections, MDA (or its designee) will perform annual spot-check inspections on a minimum of 10 percent of all traded agricultural credits.

## **Maryland Nutrient Trading Program Website**

(<http://www.mdnutrienttrading.com>)

MDA has established a website to provide information and necessary resources to those interested in participating in nutrient trading or considering trading as a possibility. Everything you need to understand Maryland's nutrient trading program and to begin participating in it can be found on this website.

The resources available to you on the website include:

- Background material on nutrient trading
- Maryland's nutrient trading policy
- An informational video
- Application forms
- A credit estimation tool that you can use to calculate the number of credits you might be able to generate
- An public marketplace where you can post offers to sell credits and communicate with potential buyers
- A public registry of trading activity

## **The Maryland Nutrient Trading Tool**

The Maryland Nutrient Trading Tool was designed specifically for Maryland's nutrient trading program, and it allows users to estimate credits generated through various agricultural practices, buy and sell credits online, and manage and track credits. The trading tool is accessible via Maryland's nutrient trading program website. Appendix A includes a User's Guide to walk you through the functions of the tool's components.

### **Login and Account Set-up**

You will first need to apply for a login to set up your personal account. You can do this by clicking on "Create an Account" and completing the required information. MDA will notify you by e-mail that when your account is activated.

Once your account is activated, you will be able to sign in and enter data about your operation on worksheets which will be saved and stored. Your account is confidential and only you will be able to access the information in your file on the site.

### **Credit Calculation Tool**

The Maryland Nutrient Trading Tool is based on the NutrientNet platform developed by the World Resources Institute and integrates the USDA's Nutrient Tracking Tool (NTT) into its calculations for crop and pasture operations (animal confinement area calculations are handled separately). The calculation component allows users to determine whether an agricultural operation meets baseline and estimates the credits that can be generated through various actions. Users calculate nitrogen and phosphorus credits by locating and drawing the agricultural operation on the map. The information behind the map supplies the correct delivery ratio, applicable baseline, soil type, and acres. Users then add information about the various fields within their parcel, including crops, crop rotations, Mehlich-3 P test values fertilizer applications,

recent manure analysis results (if applicable), tillage operations, irrigation practices, and harvest dates. For pasture, users will also need to input the type and number of grazing animals.

Next, users describe current and planned BMPs that will be used to meet baseline. This information is required to determine whether the operation has met the applicable baseline and is eligible to trade. If a parcel meets baseline, the user will be allowed to identify existing BMPs that can be applied to credit generation and/or additional BMPs that can be installed to produce credits.

For confined animal operations, users must first verify that they meet the practice-based baseline requirements. To calculate the current load and eligible credits, users must supply number and type of confined animals, days confined, and the results of a recent manure analysis test (the analysis should have values for manure nutrient content as excreted). Users must also identify all BMPs that are currently in place and/or required by their Nutrient Management Plan and Soil and Water Conservation Plan, or their Comprehensive Nutrient Management Plan if applicable. Next users may estimate credits that can be generated through additional practices on the farm by selecting additional BMPs and estimating reductions.

## **Trading Registry and Marketplace**

Once credit applications have been submitted to MDA and subsequently approved and certified, the credits are given a unique registration number and entered by MDA in the online Trading Registry. Once credits are certified, users may post credits on the marketplace. The Maryland Nutrient Trading Program website contains both a nitrogen and phosphorus marketplace so sellers may post available credits to the appropriate marketplace and buyers may purchase the type of credit that is necessary to meet permit load obligations. The marketplace is organized as a bid system so buyers may propose prices per credit that sellers are free to accept or decline. Once a seller accepts a bid, a contract must be agreed to by both parties. Depending on the identity of the buyer, sales must be submitted to and approved by MDA and/or MDE.

Finally, the trade registry allows users and the general public to view all certified credits and completed trades.



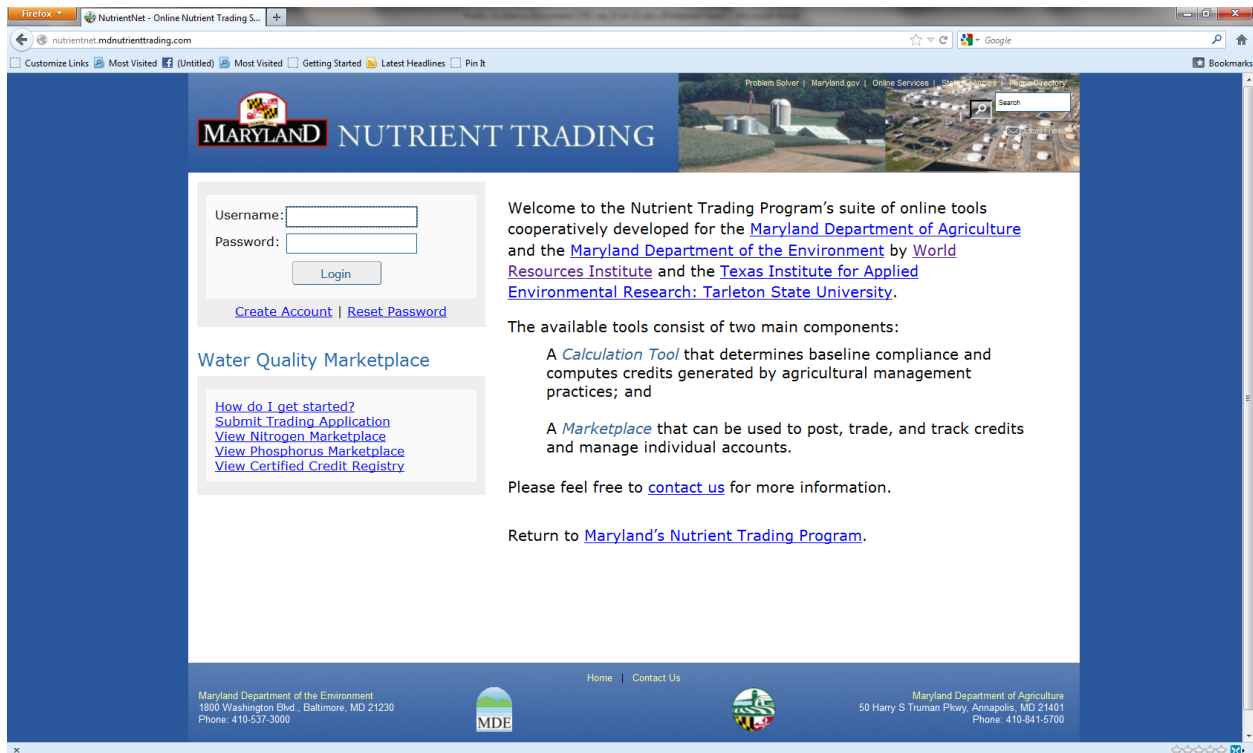
## **Appendix A. NutrientNet User's Guide**





## How to Log In

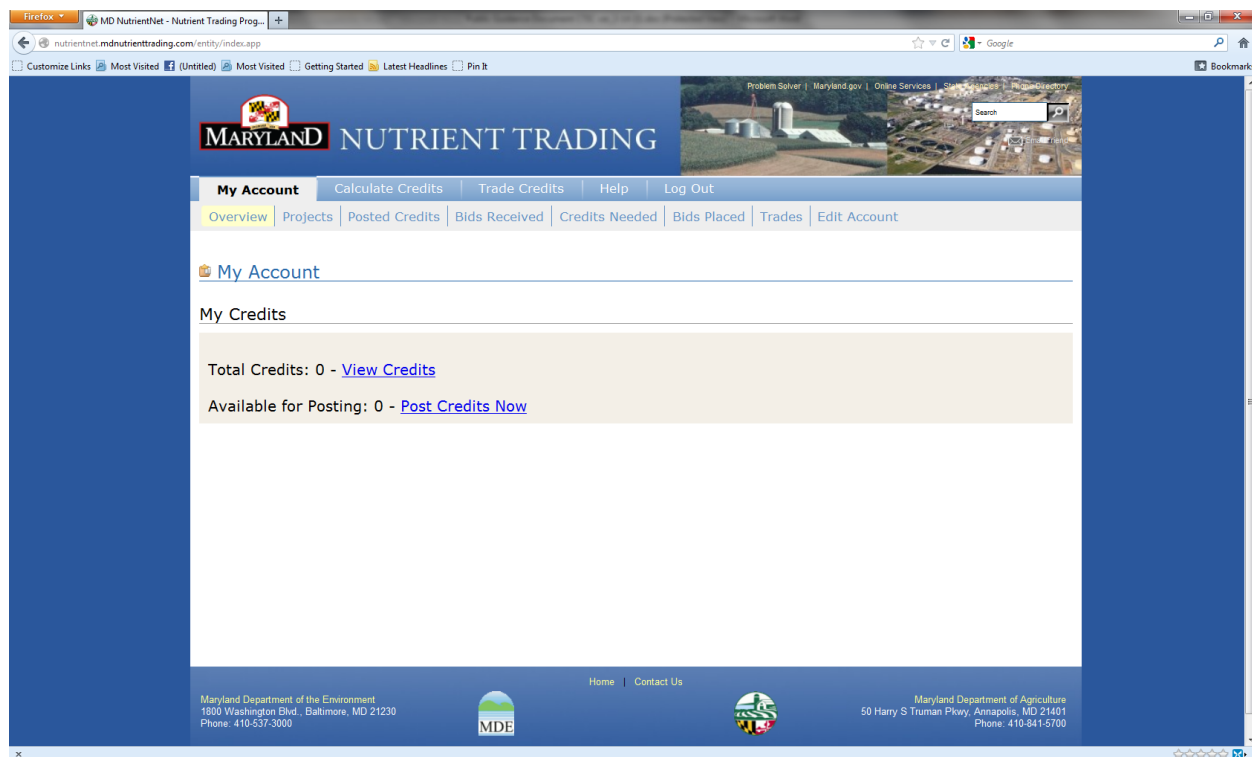
Go to the Maryland Nutrient Trading website at <http://www.mdnutrienttrading.com/> and “Login to Market.”



The screenshot shows the Maryland Nutrient Trading website in a Firefox browser window. The page has a blue header with the Maryland state flag and the text "MARYLAND NUTRIENT TRADING". Below the header, there is a login section on the left with fields for "Username:" and "Password:", a "Login" button, and links for "Create Account" and "Reset Password". To the right of the login section, there is a "Water Quality Marketplace" section with links: "How do I get started?", "Submit Trading Application", "View Nitrogen Marketplace", "View Phosphorus Marketplace", and "View Certified Credit Registry". Further right, there is a welcome message: "Welcome to the Nutrient Trading Program's suite of online tools cooperatively developed for the Maryland Department of Agriculture and the Maryland Department of the Environment by World Resources Institute and the Texas Institute for Applied Environmental Research: Tarleton State University." Below this, it states: "The available tools consist of two main components: A Calculation Tool that determines baseline compliance and computes credits generated by agricultural management practices; and A Marketplace that can be used to post, trade, and track credits and manage individual accounts." At the bottom of the main content area, it says: "Please feel free to contact us for more information." and "Return to Maryland's Nutrient Trading Program." The footer contains contact information for the Maryland Department of the Environment and the Maryland Department of Agriculture, along with their logos.

To log in, enter your username and password in the appropriate fields.

If you do not have a username and password, click “Create Account” and complete the required information. Maryland Department of Agriculture will send you notification by e-mail when your account is activated.



Once you sign in, you will see your account dashboard. This gives you a snapshot of the total number of certified credits in your account.

# How to Calculate Credits

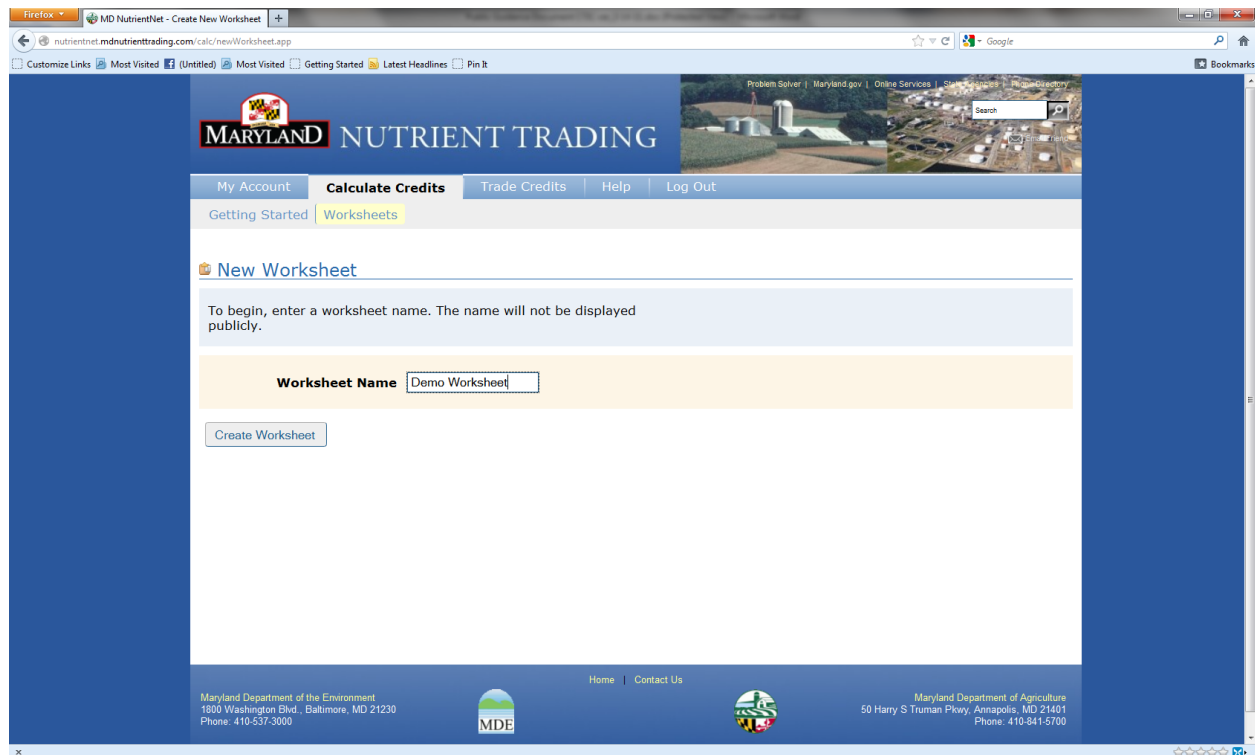
The screenshot shows the Maryland Nutrient Trading website interface. The top navigation bar includes 'My Account', 'Calculate Credits' (selected), 'Trade Credits', 'Help', and 'Log Out'. Below this, the 'Worksheets' sub-menu is active. The main content area is titled 'Agricultural Farm Worksheets' and states 'Saved worksheets are listed below.' A link to 'Add Farm Worksheet' is provided. A table displays a list of worksheets, showing details such as the worksheet ID, name, creation date, number of fields, and completion status. Each row also includes links for 'Copy', 'Delete', and 'Send to Support'.

Farm Worksheet	Created	Fields	Status	Copy	Delete	Send to Support
PCL-001477 Jones Farm (copy @ 2012-12-19)	2012-12-19	1	17% complete	<a href="#">Copy</a>	<a href="#">Delete</a>	<a href="#">Send to Support</a>
PCL-001429 Jones Farm	2012-10-09	3	83% complete	<a href="#">Copy</a>	<a href="#">Delete</a>	<a href="#">Send to Support</a>
PCL-001409 Bay Program Farm _test1 <b>Outdated</b>	2012-09-17	1	Not started	<a href="#">Copy</a>	<a href="#">Delete</a>	<a href="#">Send to Support</a>
PCL-001407 Corn _test1 <b>Outdated</b>	2012-09-17	-	Not started	<a href="#">Copy</a>	<a href="#">Delete</a>	<a href="#">Send to Support</a>
PCL-001378 Linden Farm, VA (copy @ 2012-08-14) <b>Outdated</b>	2012-08-14	11	Not started	<a href="#">Copy</a>	<a href="#">Delete</a>	<a href="#">Send to Support</a>
PCL-001376 Whitescarver Farm, VA <b>Outdated</b>	2012-08-10	5	20% complete	<a href="#">Copy</a>	<a href="#">Delete</a>	<a href="#">Send to Support</a>
PCL-001371 Linden Farm, VA <b>Outdated</b>	2012-08-02	11	Not started	<a href="#">Copy</a>	<a href="#">Delete</a>	<a href="#">Send to Support</a>

Click on the *Calculate Credits* tab, and navigate to the *Worksheets* sub-menu tab to view all saved agricultural worksheets.

Click “Add Farm Worksheet” to create a new worksheet. Or click on a saved worksheet to modify or complete a saved worksheet.

Other options on this page include deleting or copying saved worksheets.



Once you click on “Add Farm Worksheet” you will be asked to provide the worksheet name. This name is for your reference only and will be the worksheet name displayed in the *Worksheets* dashboard page.

**Demo Worksheet** Worksheet PCL-001484

Summary **Edit Details** Edit Location Review Submit

**Worksheet and Project Information**

Enter worksheet and project information.

**Farm name** Demo Worksheet

**(FSA) Tract number** 123

Farm notes optional

**Site Information**

Enter credit-generating site information. Enter the address of the site you are implementing BMPs on, not your mailing address.

**Generator type** Landowner/Producer

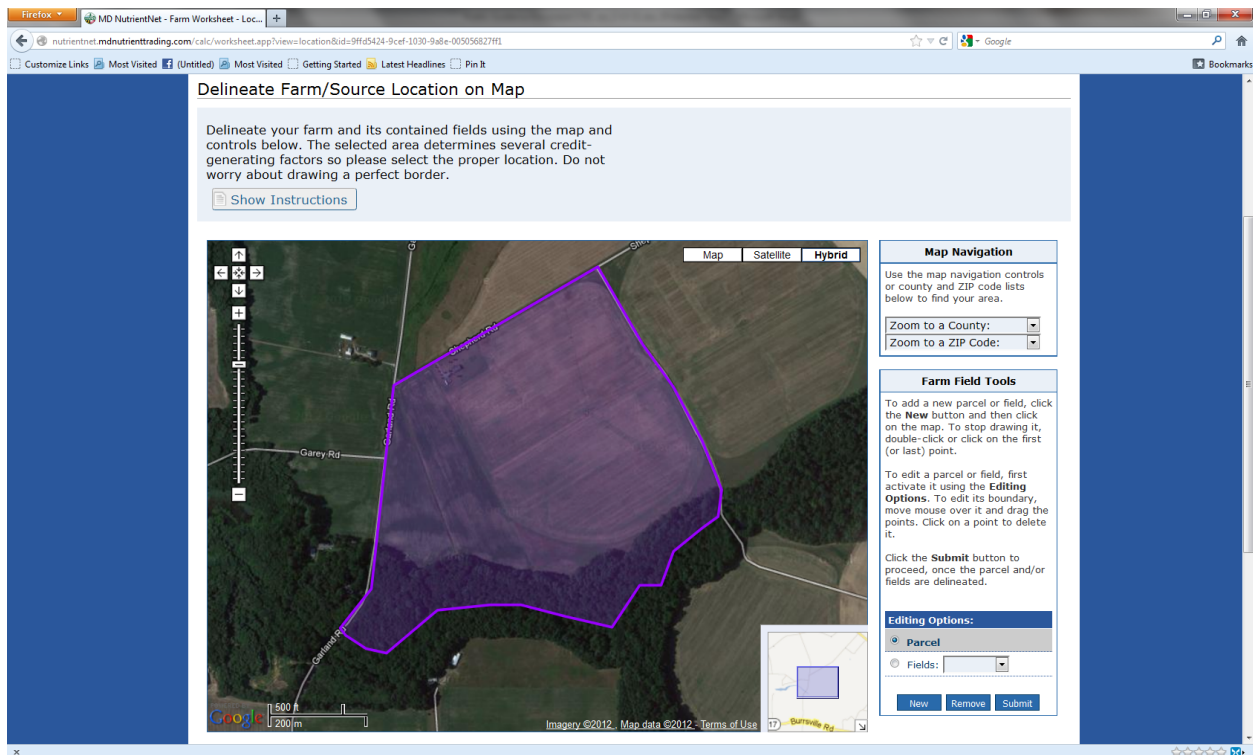
**Name** Farmer Smith

Address optional 123 Gum Road

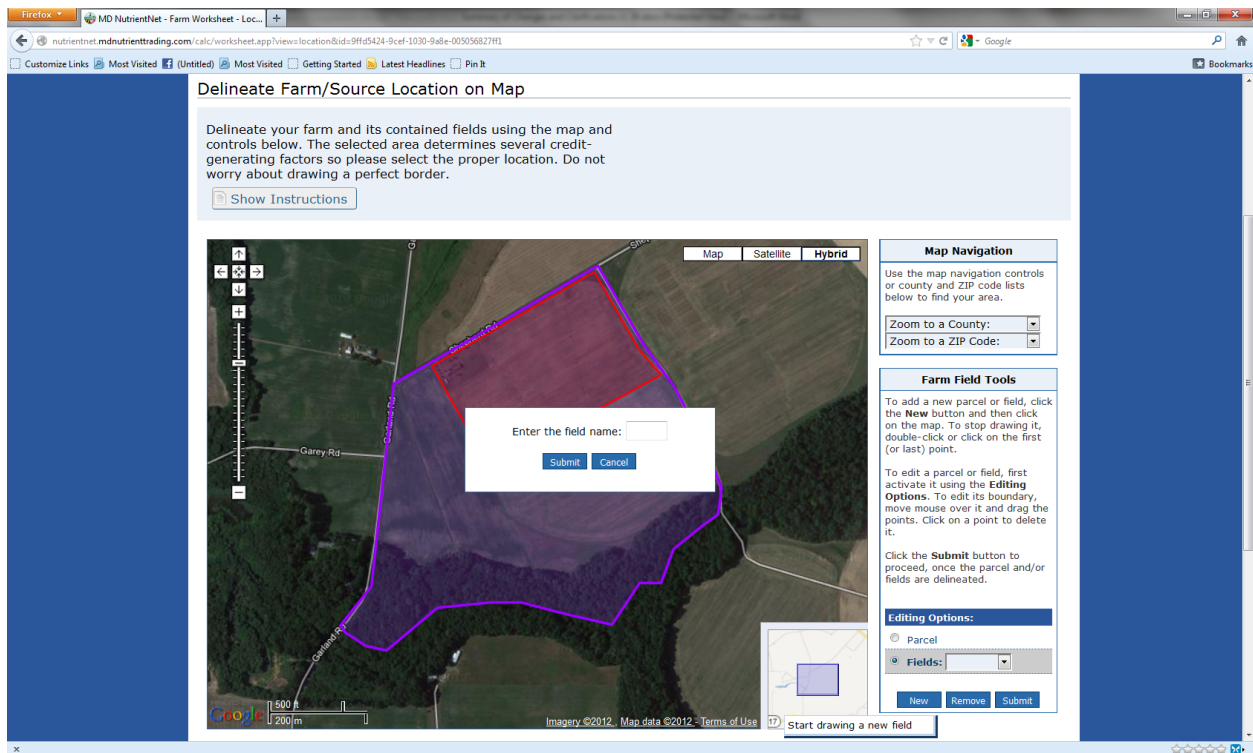
Address 2 optional

Location description

Enter details about the parcel in the parcel *Edit Details* tab. If you do not have or know the FSA parcel #, you may enter any number for your reference. In the “Farm notes” box, enter information such as details about agronomic practices or the number and type of animals. The “Location description” box can be used to provide any further description of the location if needed. The address provided should be the physical address of the parcel. However, if you are an aggregator, the first Address field should be your address, and Address 2 should be the address of the farm. Bolded fields are required.

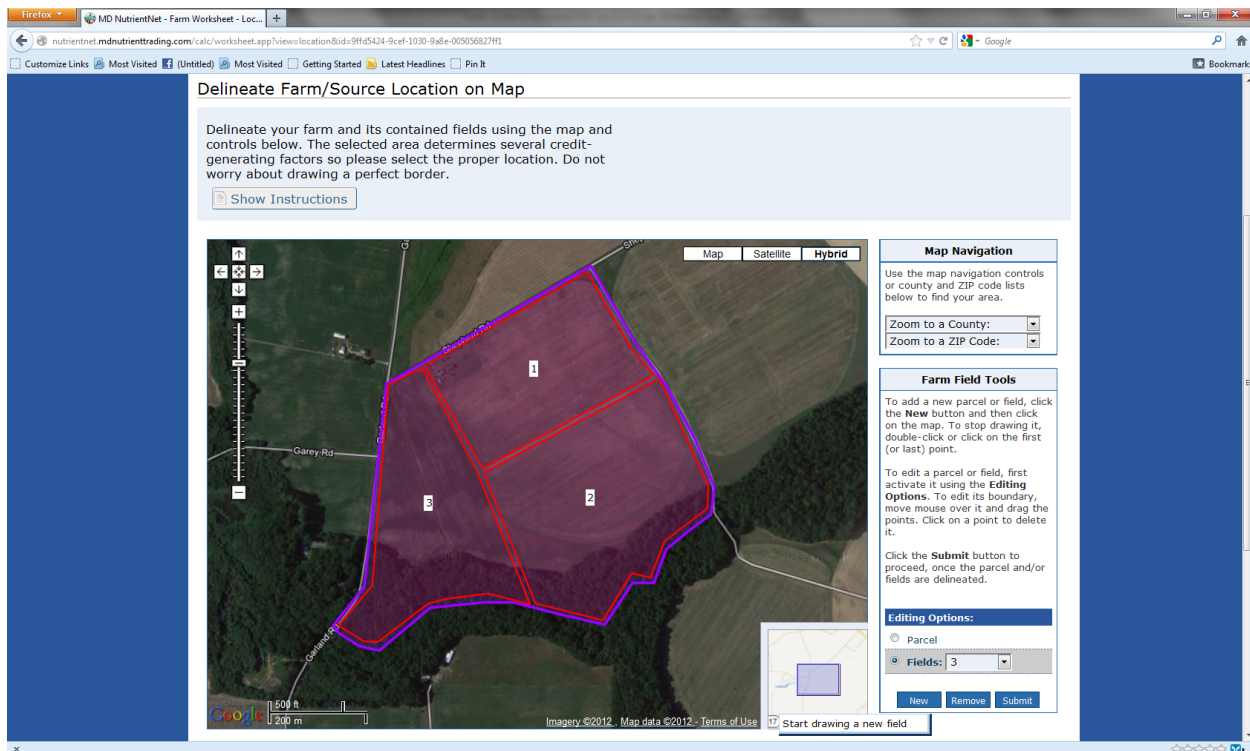


On the *Edit Location* tab, first delineate the parcel. You can zoom to a county or zip code using drop down lists to right of map under “Map Navigation.” Once you are zoomed in to your parcel, click “New” and begin outlining your parcel on the map by clicking on the map. (Additional directions for delineating fields on the map can be found under “Farm Field Tools” to the right of the map.) Click “Submit” when you are finished. (If you wish to re-draw, click “Remove” and begin again.)



Select the “Fields” button beside the map. Click “New” and begin drawing your field WITHIN the parcel boundary that you have delineated. Once field outline is completed, you will be prompted to enter the field name. Field delineations are not required to follow FSA field delineations. See next page for further instructions.





Field delineations should contain any existing riparian and/or conservation buffers adjacent to the field (e.g. grass and forested areas that are both adjacent and down slope from your field and thus provide filtration for field runoff). Continue outlining all fields within your parcel by clicking “New” after each successful field delineation. When you are done delineating fields, click “Submit.”

**DETAILS**

Farm name: Demo Worksheet  
 (FSA) Tract number: 123  
 Farm notes: n/a  
 Generator type: Landowner/Producer  
 Name: Farmer Smith  
 Address: 123 Gum Road  
 Address 2: n/a  
 Location description: n/a  
 City: Mytown  
 Zip code: n/a  
 County: Talbot

**TOTALS**

Farm area (from map): 94.91  
 Farm area (sum of fields): 0.00  
 Number of fields: 3  
 Percent complete: 0%  
 Buffered area: 0.00 ac  
 Wetland area: 0.00 ac  
 Converted area: 0.00 ac  
 Farm meets baseline: No  
 N baseline load (EOS): 0 lb/yr  
 N current load (EOS): 0 lb/yr  
 P baseline load (EOS): 0 lb/yr  
 P current load (EOS): 0 lb/yr

**Field Listing**

This farm's fields are listed below. To add a field, use the [Edit Location](#) tab.

Field	Area (ac)	Baseline & Load	Reduction to Bay	Credits to Trade	Status
<a href="#">Field: 1</a>	--	--	--	--	Not started <a href="#">Delete</a>
<a href="#">Field: 2</a>	--	--	--	--	Not started <a href="#">Delete</a>
<a href="#">Field: 3</a>	--	--	--	--	Not started <a href="#">Delete</a>

You will be directed to the *Summary* tab. The *Summary* tab will now contain a list of all the fields you have outlined. To begin adding field details, click on the field name. The status bar beside each field allows you to view progress made towards completing the field details. You may also delete fields by clicking “Delete” on the far right after the “Status” column.

**MARYLAND NUTRIENT TRADING**

My Account | **Calculate Credits** | Trade Credits | Help | Log Out

Getting Started | **Worksheets**

[Demo Worksheet](#) > [Field 1](#) > [General](#) Worksheet PCL-001484

**General**

**Field Information**

Enter field information.

Chesapeake Bay segment: A24011EM3\_4321\_0000 (in Everywhere Else trading basin)  
 TMDL watershed: No  
 (FSA) Field number:  Examples: 1, 7, 18b  
 Field type:   
 Notes:   
 optional

[Save & Continue](#)

At the top of this page you will see your Chesapeake Bay segment number, the trading basin in which the farm is located, and whether or not you are in a watershed with a TMDL for a local impaired waterbody; this information was generated based on the location you drew on the map. Begin filling in details about individual fields within your parcel. In the *General* tab, select whether the field is crop/pasture, animal confinement, or non-managed land. Provide additional notes about the field if necessary. If this field is classified as non-managed land, it is automatically assumed to meet baseline and no further details will be required.

### Crop/Pasture Scenario

nutrientnet.mdnutrienttrading.com/calc/field/worksheet.app?view=land&id=9ff05424-9cef-1030-9a8e-00505682791&fid=8552

#### Soil Characteristics

Enter soil information. If the soil information below, derived from the farm's location, is incorrect, complete one or more of the soil characteristic survey questions below.

**Field area** ☒ 24.43 ac (from map) ☐  ac

Tile drainage depth  ft optional

Irrigation  optional

N concentration in irrigation water (for fertigation)  ppm optional

**Soil P test method**

**Soil P test value**  ppm

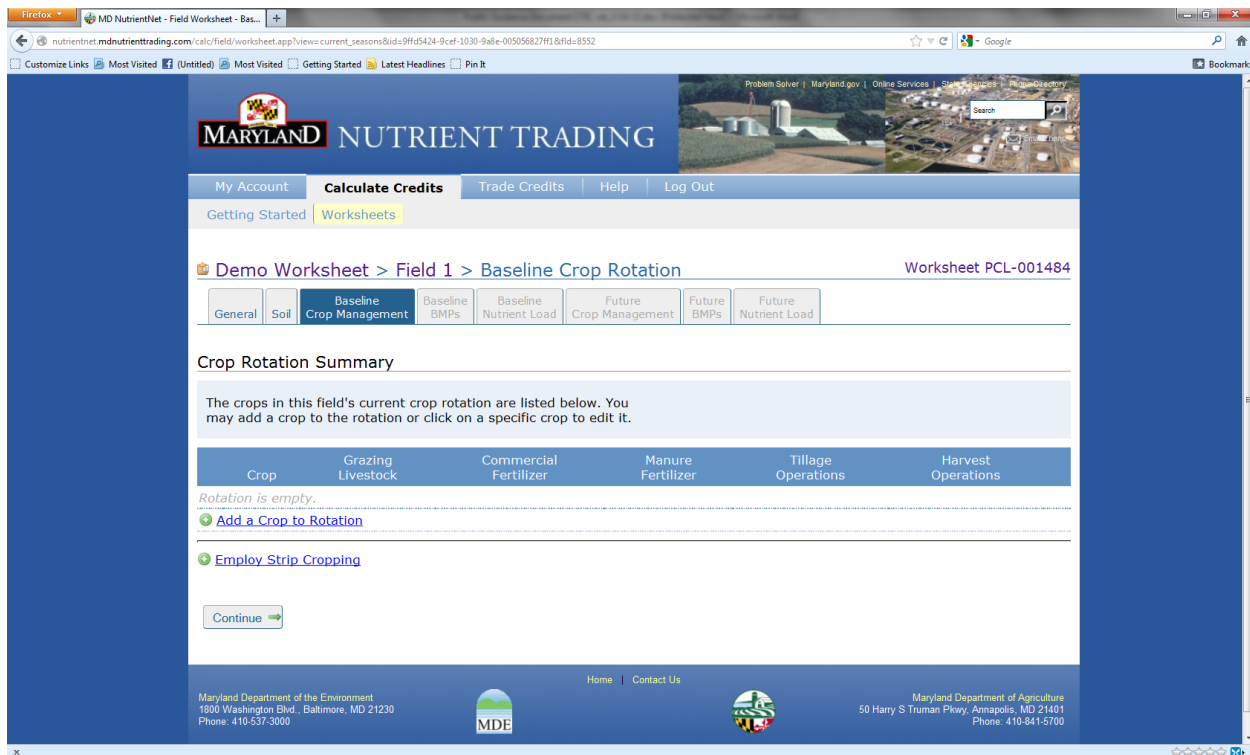
Override soil ☒ Change soil type, clay/sand/silt ratio, bulk density, organic carbon, and slope.

**Soil name**

**Clay, Sand, Silt %** ☒ 6%, 80%, 14%  %,  %, N/A Clay % + Sand % + Silt % = 100%

☒ 1.55 g/cm<sup>3</sup>

If you selected “crop/pasture,” you will be asked to provide details about your crop or pasture. The map returns an estimated value for field acreage. You may select this acreage or enter your own. You may also enter information about tile drainage and irrigation/fertigation if these practices are in place. Then, you must enter your Soil P test methodology and value. The field’s soil type and slope are estimated using the map; however, by checking the “Override soil” box, you can select a different soil as well as override default soil characteristics.



The *Baseline Crop Management* page provides a crop rotation summary. Click on “Add a Crop to Rotation” to get started. If the field is strip cropped, add a crop to the rotation and then click on “Employ Strip Cropping” and continue entering the appropriate information. If the crop rotation and management information for this field applies to any other fields, you can export the baseline crop rotation to another field. Likewise, if baseline crop management information has been entered for other fields that apply to this field, you can import baseline crop rotation from another field.

**Crop 1**

**Crop Category**

Enter the following information for the entire life cycle of this crop, as applicable. Note that some BMPs such as enhanced nutrient management, dairy feed management, conservation tillage, and cover crops will be credited automatically if the information entered on this page reflects any of these practices.

**Crop category** Corn, Grains, Cereal Grains ▾

**Crop** Corn ▾

**Plant date** Year 1 ▾ 4 Apr ▾ 15 ▾

**Planting method** Aerial ▾

Seeding rate  seeds/ac  
optional

**Grazing Livestock**

Enter grazing livestock for the given year. If livestock are grazing on pasture, plant your pasture one year prior to when livestock are grazed. This ensures that the model will calculate livestock on established pasture.

[Add a Grazing Operation](#)

**Commercial Fertilizer Applications**

Enter all commercial fertilizer applications used on this field. Please enter the total nitrogen and total phosphorus values (not ammonium or phosphate).

Choose your “Crop Category” from the first drop-down list. Then choose the specific crop within that category in the second drop-down list which immediately follows. Enter a planting date and method for this crop. Entering a seeding rate is optional. If this field is a pasture, you can choose one of the pasture options in the crop lists. You can then add commercial and/or manure fertilizer applications for your field. Multiple applications can be applied at various times throughout the year.

**Crop category** Pasture, Pasture Grasses

**Crop** Fescue

**Plant date** Year 1 4: Apr 1

**Planting method** Broadcast

Seeding rate  seeds/ac  
optional

### Grazing Livestock

Enter grazing livestock for the given year. If livestock are grazing on pasture, plant your pasture one year prior to when livestock are grazed. This ensures that the model will calculate livestock on established pasture.

**Grazing Livestock #1**

**Start date** Year 1 4: Apr 15

**End date** Year 1 10: Oct 31

**Animal** Beef Cows

**Animal units** 50

**Hours grazed** 24

Precision-feeding ☐

[Remove](#)

[Add a Grazing Operation](#)

Hours grazed per day.

Precision feeding applies only to dairy cows.

If livestock is grazing on the pasture for any amount of time during the year, click on “Add a Grazing Application” below the “Crop Category” section to enter grazing details. Although pasture may already exist, it must be given a planting date. Plant the pasture during the normal growing season and graze as accurate starting in Year 1. The model will not actually graze the animals until the pasture is established.

MD NutrientNet - Field Worksheet - Bas...

nutrientnet.mdnutrienttrading.com/calc/field/worksheet.app?view=current\_seasons&id=9ffd5424-9cef-1030-9a1e-00056827f91&fid=8552&ssn=33770

Customize Links Most Visited (Untitled) Most Visited Getting Started Latest Headlines Pin It Bookmarks

[Add a Tillage Operation](#)

### Harvest Operations

Enter harvest operations here.

**Harvest Operation #1**

**Date** Year 1 ▾ 9 Sep ▾ 15 ▾

[Remove](#)

[Add a Harvest Operation](#)

### End of Season

Enter the end-of-season date for this crop. If harvest operations are performed on this crop, this date should match the final harvest date. The kill date should generally occur on or after the final harvest date and before the plant date of any subsequent crop in this rotation (though in some instances aerial seeding might be used to plant a subsequent crop before the final harvest and kill dates of an existing crop in which case the harvest and kill dates of the existing crop would come after the plant date of the subsequent crop). A kill date is not required for perennial plants.

**End-of-season/Kill date** Year 1 ▾ 9 Sep ▾ 15 ▾

If this is a perennial crop, kill date is optional. Otherwise a kill date is required and should generally coincide with the latest tillage operation.

[Save & Add Crops](#) [Save & Continue](#)

After you enter your crop, grazing, and fertilizer information, scroll down to enter tillage operations, if applicable. Finally, enter a harvest date for the crop you selected and an end-of-season or kill date, if applicable. All annual crops will have a kill date, typically the same as the harvest date. However, the kill date may be left blank if this is a perennial crop or pasture that will be left to grow the following year(s). Annual crops, including commodity cover crops or cover crops that are partially removed, should be harvested and killed. Cover crops that remain on the field after the end of the growing season should only be killed. Perennial crops, such as pasture or hay, may be harvested multiple times over multiple years without being killed. At the bottom of the page, you can “Save & Continue” if this field has only one crop year-round, or you can “Save & Add crops” to add a crop to your rotation. Rotations can continue for multiple years by specifying the year each crop is planted, harvested, killed, etc. For accuracy, you should enter each crop in your rotation. For instance, if you grow corn and soybeans in years 1 and 2 followed by four years of alfalfa, you should enter six years of crop rotations. In the special case where a winter crop, such as a cover crop, is planted as the last crop in a rotation, the kill (and harvest, if applicable) date should be entered in Year 1 to ensure that the model will repeat the rotation.

MD NutrientNet - Field Worksheet - Bas...

nutrientnet.mdnutrienttrading.com/calc/field/worksheet.app?view=current\_bmps&id=9ff5424-9cef-1030-9ade-005056827ff1&fid=8552

Customize Links Most Visited (Untitled) Most Visited Getting Started Latest Headlines Pin It

General Soil Baseline Crop Management **Baseline BMPs** Baseline Nutrient Load Future Crop Management Future BMPs Future Nutrient Load

### Baseline BMPs

All additional BMPs not captured under the Baseline Crop Management tab should be listed here.

### Cropland and Pasture BMPs

Enter information for all cropland or pasture BMPs.

Show BMP Descriptions

BMP #1 Conservation Planning on Low-till

Area of BMP 24 ac

Planned ☐

Check this box if this BMP is not currently in place but will be implemented in the future to meet baseline load requirements.

BMP #2 Decision Agriculture

Area of BMP 24 ac

Planned ☐

Check this box if this BMP is not currently in place but will be implemented in the future to meet baseline load requirements.

BMP #3

Area of BMP 0 ac

Planned ☐

Check this box if this BMP is not currently in place but will be implemented in the future to meet baseline load requirements.

Once you have submitted your crop rotation management scenario, you will be directed to the *Baseline BMPs* tab. Describe current best management practices that exist on the field. When entering acreage of agronomic practices, include the total acres of the field as drawn, including buffer and wetland acres. Also, keep in mind that many BMPs are implied in your crop management scenario. For example, no-till, conservation-till, cover crops, nutrient management, etc. will all be reflected in crop management and are thus not available as options on the *Baseline BMPs* tab.



MD NutrientNet - Field Worksheet - Bas...

nutrientnet.mdnutrienttrading.com/calc/field/worksheet.app?view=current\_bmps&id=9ff5424-9cef-1030-9a8e-005056827ff1&fid=8552

Customize Links Most Visited (Untitled) Most Visited Getting Started Latest Headlines Pin It

implemented in the future to meet baseline load requirements.

### Riparian/Conservation Buffer BMPs

Enter information if you have a riparian/conservation buffer BMP in place.

Note: If the nitrogen load reduction calculated for alternative watering facility is greater than that for buffers, it will be used instead.

[Show Buffer BMP Descriptions](#)

Forest buffer in place ☒

Average width of buffer  ft

Linear feet of buffer  ft

Area of buffer  ac

Planned ☐

Check this box if this BMP is not currently in place but *will be implemented* in the future to meet baseline load requirements.

Grass buffer in place ☐

Average width of buffer  ft

Linear feet of buffer  ft

Area of buffer  ac

Planned ☐

Check this box if this BMP is not currently in place but *will be implemented* in the future to meet baseline load requirements.

Planning to convert

If the field has a buffer, check that a forest or grass buffer is in place and enter the average width and length. Note that if the width of a buffer is less than 35 feet (in other words, the buffer is non-standard), credit will be given for a land use conversion; if the buffer is 35 to 100 feet wide, credit will be given for a forest/ grass riparian or conservation buffer; if the buffer is wider than 100 feet, no additional credit for upland acres will be given but there will be additional credit for a land use conversion.

Firefox | MD NutrientNet - Field Worksheet - Bas... | nutrientnet.md | nutrienttrading.com/calc/field/worksheet.app?view=current\_load&id=9ff5424-9cf-1030-9a8e-005056827911&fid=8552 | Google | Bookmarks

Demo Worksheet > Field 1 > Baseline Load | Worksheet PCL-001484

General | Soil | Baseline Crop Management | Baseline BMPs | **Baseline Nutrient Load** | Future Crop Management | Future BMPs | Future Nutrient Load

### Edge of Segment Baseline Load Summary

Below is a summary of the current field's estimated edge-of-segment load. For comparison purposes, the target baseline load for your segment is displayed. Baseline eligibility cannot be determined for your parcel/tract until all fields have been evaluated. In order to meet baseline, your parcel/tract must, in aggregate, meet the target baseline load for all crop/pasture acres, as well as meet the practice-based baseline criteria for animal confinement areas (if applicable).

**Farm baseline load qualification cannot be determined.**  
 You must evaluate all fields on your farm before baseline eligibility can be determined. The following fields remain: [2](#), [3](#)

Nitrogen	
Baseline Load (EOS): 285.8 lb	11.7 lb/ac
Current Load (EOS): 199.3 lb	8.2 lb/ac

Phosphorus	
Baseline Load (EOS): 24.4 lb	1.0 lb/ac
Current Load (EOS): 16.9 lb	0.7 lb/ac

Crop Management Summary

Once you select your baseline BMPs, the tool will display the estimated edge of segment load for your field. For comparison purposes, the average baseline load requirement is also displayed. In order to determine whether or not you meet baseline requirements, you will have to evaluate all fields in your farm/tract. Your farm/tract must meet the baseline load requirement in aggregate in order to qualify to generate credits.

Firefox | MD NutrientNet - Farm Worksheet - Summary

nutrientnet.mdnutrienttrading.com/calc/worksheet.app?views=summary&id=9ff65424-9cef-1030-9a8e-005056827ff3

Customize Links | Most Visited | (Untitled) | Most Visited | Getting Started | Latest Headlines | Pin It | Bookmarks

Farm name: Demo Worksheet

(FSA) Tract number: 123

Farm notes: n/a

Generator type: Landowner/Producer

Name: Farmer Smith

Address: 123 Gum Road

Address 2: n/a

Location description: n/a

City: Mytown

Zip code: n/a

County: Talbot

Farm area (from map): 94.91

Farm area (sum of fields): 24.43

Number of fields: 3

Percent complete: 22%

Buffered area: 0.00 ac

Wetland area: 0.00 ac

Converted area: 0.00 ac

Farm meets baseline: No

N baseline load (EOS): 598.9 lb/yr

N current load (EOS): 969.6 lb/yr

P baseline load (EOS): 51.2 lb/yr

P current load (EOS): 61.1 lb/yr

**Field Listing**

This farm's fields are listed below. To add a field, use the [Edit Location](#) tab.

Field	Area (ac)	Baseline & Load	Reduction to Bay	Credits to Trade	Status	
<a href="#">Field: 1</a> Crop/pasture	24.43	N: 285.8 : 515.4 lb/yr - P: 24.4 : 33.7 lb/yr	-	-	67% complete	<a href="#">Delete</a>
<a href="#">Field: 2</a> -	-	-	-	-	Not started	<a href="#">Delete</a>
<a href="#">Field: 3</a> -	-	-	-	-	Not started	<a href="#">Delete</a>

Home | Contact Us

To continue evaluating additional fields in your farm/tract, you can click on the field name from the *Summary* page, or follow the link that appears at the top of the *Baseline Nutrient Load* page in the message box.

Firefox | MD NutrientNet - Field Worksheet - Bas... | nutrientnet.md | nutrienttrading.com/calc/field/worksheet.app?view=current\_load&id=9ff5424-9cef-1030-9a8e-00505682791&fid=8554 | Google | Customize Links | Most Visited | (Untitled) | Most Visited | Getting Started | Latest Headlines | Pin It | Bookmarks

Demo Worksheet > Field 3 > Baseline Load | Worksheet PCL-001484

General | Soil | Baseline Crop Management | Baseline BMPs | Baseline Nutrient Load | Future Crop Management | Future BMPs | Future Nutrient Load

### Edge of Segment Baseline Load Summary

Below is a summary of the current field's estimated edge-of-segment load. For comparison purposes, the target baseline load for your segment is displayed. Baseline eligibility cannot be determined for your parcel/tract until all fields have been evaluated. In order to meet baseline, your parcel/tract must, in aggregate, meet the target baseline load for all crop/pasture acres, as well as meet the practice-based baseline criteria for animal confinement areas (if applicable).

**This farm does not meet baseline.**

In order to qualify to generate credits you will need to reduce your farm load by changing your management practices and/or by implementing additional BMPs in the [Baseline Crop Management](#) and [Baseline BMPs](#) tabs for one or more fields.

#### Nitrogen

Baseline Load (EOS): 313.1 lb	11.7 lb/ac
Current Load (EOS): 454.2 lb	17.0 lb/ac

#### Phosphorus

Baseline Load (EOS): 26.8 lb	1.0 lb/ac
Current Load (EOS): 27.4 lb	1.0 lb/ac

Once all field information has been entered, the loads will be aggregated to determine if the tract meets baseline for each nutrient. Note that if the tract is significantly under baseline, you may wish to remove some annual practices from the baseline scenario (as long as you can still meet baseline) and move them to the future scenario so they can serve to generate credits. If the tract does not meet baseline as a whole, you must go back to the *Baseline BMPs* tab for select fields and include additional BMPs that you agree to implement in order to meet baseline requirements. In addition, you might choose to alter management practices on select fields.

Firefox | MD NutrientNet - Field Worksheet - Bas... | nutrientnet.mdnutrienttrading.com/calc/field/worksheet.app?view=current\_bmps&id=9ffd5424-9cef-1030-9a8e-005056827ff1&fid=8553

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### Riparian/Conservation Buffer BMPs

Enter information if you have a riparian/conservation buffer BMP in place.

Note: If the nitrogen load reduction calculated for alternative watering facility is greater than that for buffers, it will be used instead.

[Show Buffer BMP Descriptions](#)

**Forest buffer in place** ☐

Average width of buffer  ft

Linear feet of buffer  ft

Area of buffer  ac

Planned ☐

Check this box if this BMP is not currently in place but *will be implemented* in the future to meet baseline load requirements.

**Grass buffer in place** ☒

**Average width of buffer**  ft

**Linear feet of buffer**  ft

Area of buffer  ac

Planned ☒

Check this box if this BMP is not currently in place but *will be implemented* in the future to meet baseline load requirements.

**Planning to convert grass buffer to trees** ☐ There is no grass buffer to convert.

If you return to the *Baseline BMPs* tab to enter more BMPs in order to meet baseline for the tract, be sure to indicate that the BMPs are planned. The “Planned” check box is located under each BMP. If you have only changed management practices, please describe these planned management changes in the field located at the bottom of the *Baseline BMPs* tab.

Firefox | MD NutrientNet - Field Worksheet - Bas... | nutrientnet.mdnutrienttrading.com/calc/field/worksheet.app?view=current\_load&id=9ff5424-9cf-1030-9a8e-005056827911&fid=8555 | Google | Bookmarks

Demo Worksheet > Field 2 > Baseline Load | Worksheet PCL-001484

General | Soil | Baseline Crop Management | Baseline BMPs | **Baseline Nutrient Load** | Future Crop Management | Future BMPs | Future Nutrient Load

### Edge of Segment Baseline Load Summary

Below is a summary of the current field's estimated edge-of-segment load. For comparison purposes, the target baseline load for your segment is displayed. Baseline eligibility cannot be determined for your parcel/tract until all fields have been evaluated. In order to meet baseline, your parcel/tract must, in aggregate, meet the target baseline load for all crop/pasture acres, as well as meet the practice-based baseline criteria for animal confinement areas (if applicable).

This farm meets baseline for both nitrogen and phosphorus. You may now proceed to the Future Crop Management/Future BMPs tabs to determine credits on any or all fields.

#### Nitrogen

Baseline Load (EOS):	399.7 lb	11.7 lb/ac
Current Load (EOS):	103.7 lb	3.0 lb/ac

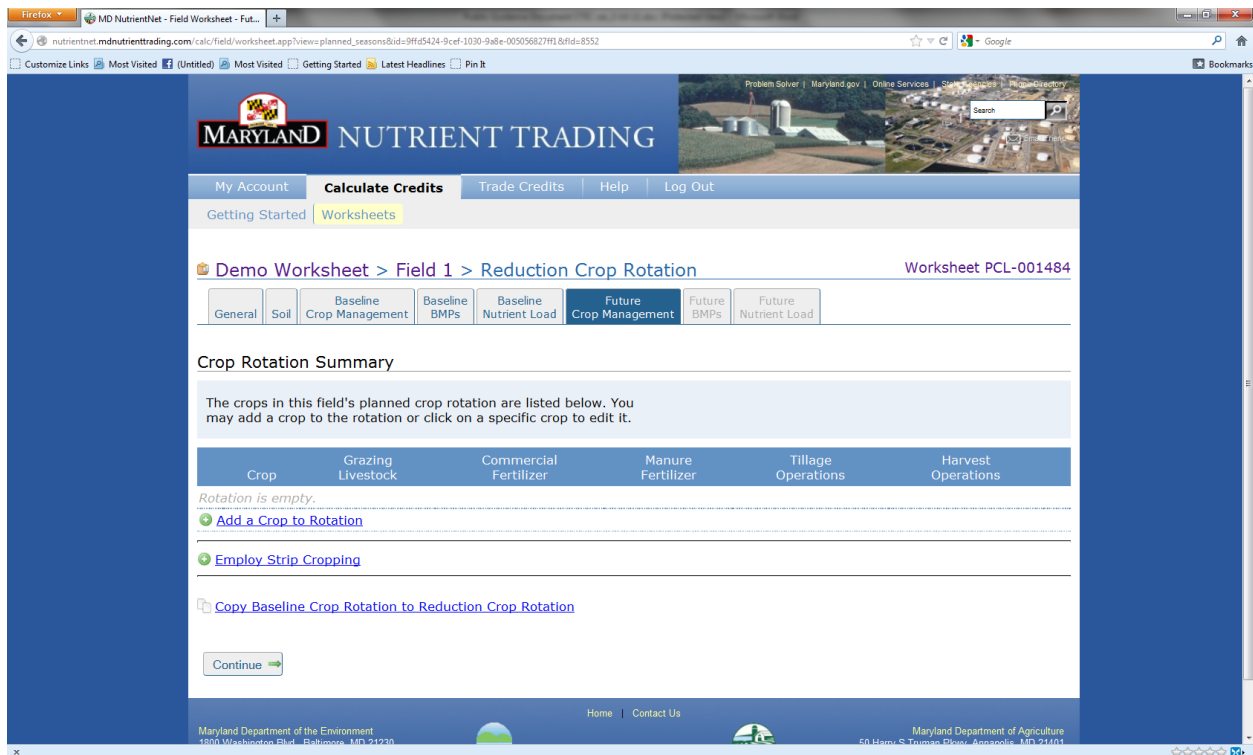
#### Phosphorus

Baseline Load (EOS):	34.2 lb	1.0 lb/ac
Current Load (EOS):	10.1 lb	0.3 lb/ac

#### Crop Management Summary

Review the nutrient and yield values for your baseline crop.

Once nitrogen and/or phosphorus baselines are met for the tract, you may start describing activities that you will implement in the future to generate credits. To do this, navigate back to the *Summary* tab by clicking on the name of your worksheet at the top left. Then select a field from the list at the bottom of the page and begin describing future activities in the *Future Crop Management* tab.



The *Future Crop Management* tab allows you to change your crop or pasture conditions by clicking on “Add a Crop to Rotation” and entering your future scenario. You can copy your previous crop or pasture scenario by clicking “Copy Baseline Crop Rotation to Reduction Crop Rotation.” If you copy in your baseline scenario, you can choose to make no changes, or you can add additional crops and make changes as needed.

	<u>Baseline</u>	<u>Reduction</u>
BMP #1	Conservation Planning on Low-till	
Area of BMP	24.00	<input type="text"/> ac
BMP #2	Decision Agriculture	
Area of BMP	24.00	<input type="text"/> ac
BMP #3		
Area of BMP		<input type="text"/> ac

Once you have submitted your future crop management scenario, you will be directed to the *Future BMPs* tab. The *Future BMPs* tab allows you to describe the BMPs you plan to install to generate reductions below baseline. For your convenience, the BMPs you entered as part of the baseline are displayed on this tab as well.



Firefox | MD NutrientNet - Field Worksheet - Fut... | nutrientnet.mdnutrienttrading.com/calc/field/worksheet.app?view=planned\_load&id=9ff05424-9cef-1030-9a8e-005056827f18&fid=8552 | Google | Bookmarks

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### Reduced Load for Field

Review the nutrient reductions and credits generated by this project.

#### Nitrogen Summary

Baseline Load (EOS):	285.8 lb	11.7 lb/ac
Current Load (EOS):	515.4 lb	21.1 lb/ac
Planned Load (EOS):	280.9 lb	11.5 lb/ac
Reductions Eligible to Generate Credits (EOS):	234.5 lb	9.6 lb/ac
Delivery Ratio:	1.00	
Reductions to Chesapeake Bay:	234.5 lb	9.6 lb/ac
Credits Generated:	234 credits/yr	Note: credits generated by crop and pasture fields are determined in aggregate and not at the per-field level.

#### Phosphorus Summary

Baseline Load (EOS):	24.4 lb	1.0 lb/ac
Current Load (EOS):	33.7 lb	1.4 lb/ac
Planned Load (EOS):	23.9 lb	1.0 lb/ac
Reductions Eligible to Generate Credits (EOS):	9.8 lb	0.4 lb/ac
Delivery Ratio:	1.00	
Reductions to Chesapeake Bay:	9.8 lb	0.4 lb/ac
Credits Generated:	10 credits/yr	Note: credits generated by crop and pasture fields are determined in aggregate

The *Future Nutrient Load* tab summarizes the expected load reductions for the field as a result of planned changes in fertilizer applications and/or planned BMPs. The reduced load is summarized in terms of edge of stream (EOS). The EOS load reflects the edge of field load as adjusted by an EOS factor that estimates the nutrient losses that occur as nutrients move over land and into the waterbody.

The Delivery Ratio represents the estimated load delivery from the edge of stream to the mainstem of the Chesapeake Bay. Segments that are close to the Bay often have a delivery ratio of “1” which means that it is assumed that 100 percent of nutrients entering the stream are delivered to the Bay.

## Animal Confinement Scenario

MD NUTRIENT TRADING

My Account | **Calculate Credits** | Trade Credits | Help | Log Out

Getting Started | Worksheets

Demo Worksheet > Field 3 > Land Worksheet PCL-001484

General | **Requirements** | Livestock | Current BMPs | Current Nutrient Load | Planned BMPs | Planned Nutrient Load

### Requirements

Landowners must have an implemented nutrient management plan and a soil and water conservation plan before being eligible to generate credits.

For confined livestock, operators must have a properly sized and maintained manure storage and runoff system to be eligible to generate credits.

☒ I have an implemented nutrient management plan.

☒ I have an implemented soil and water conservation plan.

☒ I have a properly sized and maintained manure storage and runoff system.

[Save & Continue](#)

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50 Harry S Truman Pkwy, Annapolis, MD 21401  
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If you selected “Animal Confinement” as your field type, the above screen will appear. In order to generate credits from animal confinement, the farm must have the three listed requirements in place. Check all three boxes if they are true to continue.

Demo Worksheet > Field 3 > Livestock Worksheet PCL-001484

General Requirements **Livestock** Current BMPs Current Nutrient Load Planned BMPs Planned Nutrient Load

### Livestock

Enter information for the entire life cycle of this operation.

[Show Storage Systems](#)

**Livestock Storage System** Above-ground Tank

**Input method** Totals per type  
Totals per type  
Average per type

If you employ multiple livestock storage systems, create another animal confinement area on the farm for each additional storage facility.

Select a method with which to enter your animal confinement data. Select the *Totals per type* method to enter nutrient totals or select the *Average per type* method to list average per-animal attributes.

**Livestock #1**

**Animal** Wet manure

**Total manure** 2000 T/yr

**N excreted** 6 lb/1000 gal Typically ≈ 10.69 lb/1000 gal

**P<sub>2</sub>O<sub>5</sub> excreted** 1 lb/1000 gal Typically ≈ 1.92 lb/1000 gal

[Remove](#) [Add Livestock](#)

Poultry

After checking off that baseline requirements are met for the animal confinement area, you proceed to the *Livestock* tab where you enter your livestock and/or poultry information. The first step is to select the data input method for entering livestock information. You may choose to enter total information for all livestock or average numbers per animal. Poultry data is always entered the same way regardless of the selection. For livestock operations, the totals per type method asks for the type of animal, amount of manure produced per year, and pounds of nitrogen and phosphorus excreted per ton of manure. Click on “Add Livestock” to enter total information about your confined animals and then enter the type of animals that are confined. Then, enter the tons of manure produced per year and the pounds of nitrogen and P<sub>2</sub>O<sub>5</sub> excreted. As part of the baseline requirements, you must have adequate storage for livestock. Select the storage type that is applicable to your operation.

**Livestock**

Enter information for the entire life cycle of this operation.

[Show Storage Systems](#)

**Livestock Storage System** Above-ground Tank

**Input method** Average per type

If you employ multiple livestock storage systems, create another animal confinement area on the farm for each additional storage facility.

Select a method with which to enter your animal confinement data. Select the *Totals per type* method to enter nutrient totals or select the *Average per type* method to list average per-animal attributes.

**Livestock #1**

**Animal** Milk Cows

**Quantity** 50

**Days/year confined** 180 days

**Hours/day confined** 24 hr/day

**Average weight** 550 lb

**N excreted** 6 lb/1000 gal

**P<sub>2</sub>O<sub>5</sub> excreted** 1.3 lb/1000 gal

[Remove](#)

[Add Livestock](#)

Number of confined animals

Typically ≈ 1351.35 lb

Typically ≈ 10.69 lb/1000 gal

Typically ≈ 1.92 lb/1000 gal

The other option for livestock operations is to enter the average per type method. This method asks for the type of animal, number of animals, time confined, weight, and pounds of nitrogen and phosphorus excreted. Click on “Add Livestock” and enter the average information for your confined animals. As part of the baseline requirements, you must have adequate storage for livestock. Select the storage type that is applicable to your operation.

MD NutrientNet - Field Worksheet - Live...

nutrientnet.mdnutrienttrading.com/calc/field/worksheet.app?view=current\_seasons&id=9ffd5424-9cef-1030-9a8e-005056827f91&fid=8556

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Remove

Add Livestock

### Poultry

Enter information for the entire life cycle of this operation.

Poultry #1

Animal Layers

Quantity/flock 40000

Flocks/yr 6

Days in growing cycle 45 days

N excreted 27 lb/T

P<sub>2</sub>O<sub>5</sub> excreted 8 lb/T

Remove

Add Poultry

Save & Continue

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If it is a poultry operation, select “Add Poultry” and enter the type of poultry, the number of birds per flock, number of flocks per year, number of days in a growing cycle, and pounds of nitrogen and phosphorus excreted per ton.

MD NutrientNet - Field Worksheet - Current BMPs

nutrientnet.mdnutrienttrading.com/calc/field/worksheet.app/views/current\_bmps&id=9ff5424-9cef-1030-9ade-005056827ff1&fid=8556

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General Requirements Livestock **Current BMPs** Current Nutrient Load Planned BMPs Planned Nutrient Load

### BMPs

Enter information for animal confinement best management practices.

[Show BMP Descriptions](#)

### Livestock BMPs

Select all livestock BMPs that are in place.

### Livestock Ammonia Reduction BMPs

☐ Plastic permeable lagoon cover

### Livestock Runoff Reduction BMPs

Barnyard Runoff Control/Loafing Lot Management:

- ☐ Heavy use area protection
- ☐ Clean water diversions (curbing and gutters)
- ☐ Runoff collection and infiltration (settling basins)
- ☐ Vegetated swales
- ☐ Water control structure
- ☐ Treatment wetland

### Poultry BMPs

Once you have submitted information from the *Livestock* tab, you will be asked to describe your current BMPs on the *Current BMPs* tab. Select the current BMPs that are implemented for the animal confinement area, including those required in your plans. BMPs are divided into livestock and poultry BMPs and ammonia reduction and runoff reduction BMPs.

**Demo Worksheet > Field 3 > Current Load** Worksheet PCL-001484

General Requirements Livestock **Current BMPs** **Current Nutrient Load** Planned BMPs Planned Nutrient Load

### Edge of Segment Baseline Load Summary

Below is a summary of the current field's estimated edge-of-segment load. For comparison purposes, the target baseline load for your segment is displayed. Baseline eligibility cannot be determined for your parcel/tract until all fields have been evaluated. In order to meet baseline, your parcel/tract must, in aggregate, meet the target baseline load for all crop/pasture acres, as well as meet the practice-based baseline criteria for animal confinement areas (if applicable).

This farm meets baseline for both nitrogen and phosphorus. You may now proceed to the Future Crop Management/Future BMPs tabs to determine credits on any or all fields.

#### Nitrogen

Current Manure Load (no ammonia) (EOS): 2,484.4 lb/yr
Current Ammonia Load (EOS): 6,445.4 lb/yr

#### Phosphorus

Current Load (EOS): 1,171.1 lb/yr
-----------------------------------

[Continue](#)

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The *Current Nutrient Load* tab shows your current nitrogen load broken into two categories—current manure load (no ammonia) and current ammonia load. The sum of these loads reflects your total nitrogen load. Your current phosphorus load is also shown. There is no baseline load shown because the baseline load for animal confinement areas is practice-based (see *Requirements* tab), not performance-based as is the case for crop and pasture land which have a numeric baseline.

**Livestock BMPs**

Select all livestock BMPs that are planned.

**Livestock Ammonia Reduction BMPs**

- ☒ Plastic permeable lagoon cover

**Livestock Runoff Reduction BMPs**

Barnyard Runoff Control/Loafing Lot Management:

- ☐ Heavy use area protection This BMP is currently in place.
- ☐ Clean water diversions (curbing and gutters)
- ☐ Runoff collection and infiltration (settling basins)
- ☐ Vegetated swales
- ☐ Water control structure
- ☐ Treatment wetland

**Poultry BMPs**

Select all poultry BMPs that are in planned.

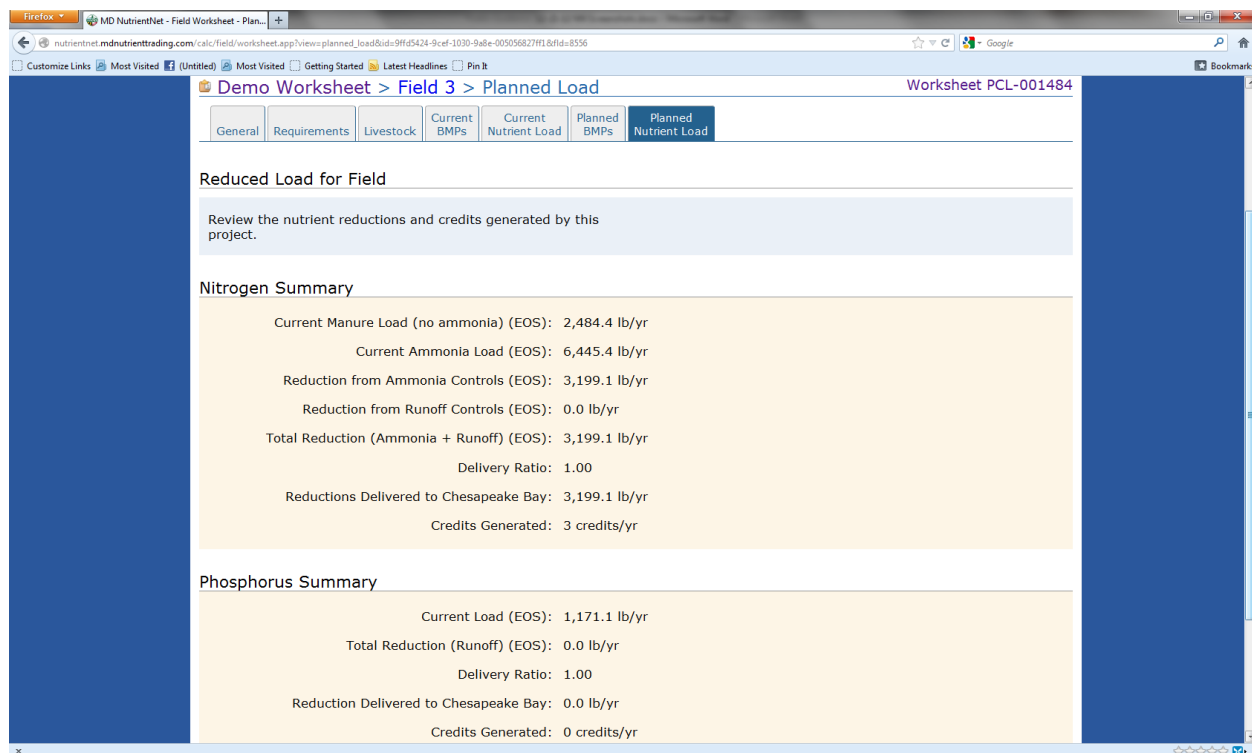
**Poultry Ammonia Reduction BMPs**

- ☒ Poultry litter treatment/alum
- ☐ Biofilter
- ☐ Vegetated environmental buffer

Once you have determined your current load, and all other fields in your tract also meet baseline, you will be able to select additional BMPs that can be implemented to generate credits on the *Future BMPs* tab. Select the BMPs that you plan to implement in order to generate nitrogen and/or phosphorus credits from your animal confinement operation.

Note: BMPs eligible to generate credits must be additional to those BMPs required as part of your CNMP or NMP.





The final *Planned Nutrient Load* tab shows your current load compared to your planned reductions and the amount of credits that could be generated by implementing the additional BMPs you selected. The reduced load is summarized in terms of edge of stream (EOS). The EOS load reflects the edge of field load as adjusted by an EOS factor that estimates the nutrient losses that occur as nutrients move over land and into the waterbody. The Delivery Ratio represents the estimated load delivery from the edge of stream to the mainstem of the Chesapeake Bay. Segments that are close to the Bay often have a delivery ratio of “1” which means that it is assumed that 100 percent of nutrients entering the stream are delivered to the Bay.

## Farm Summary

Firefox | MD NutrientNet - Farm Worksheet - Summary | nutrientnet.md | nutrienttrading.com/calc/worksheet.app?view=summary&id=9ff05424-9cef-1030-9a8e-005056827ff1 | Google | Bookmarks

**Demo Worksheet** Worksheet PCL-001484

Summary | Edit Details | Edit Location | Review | Submit

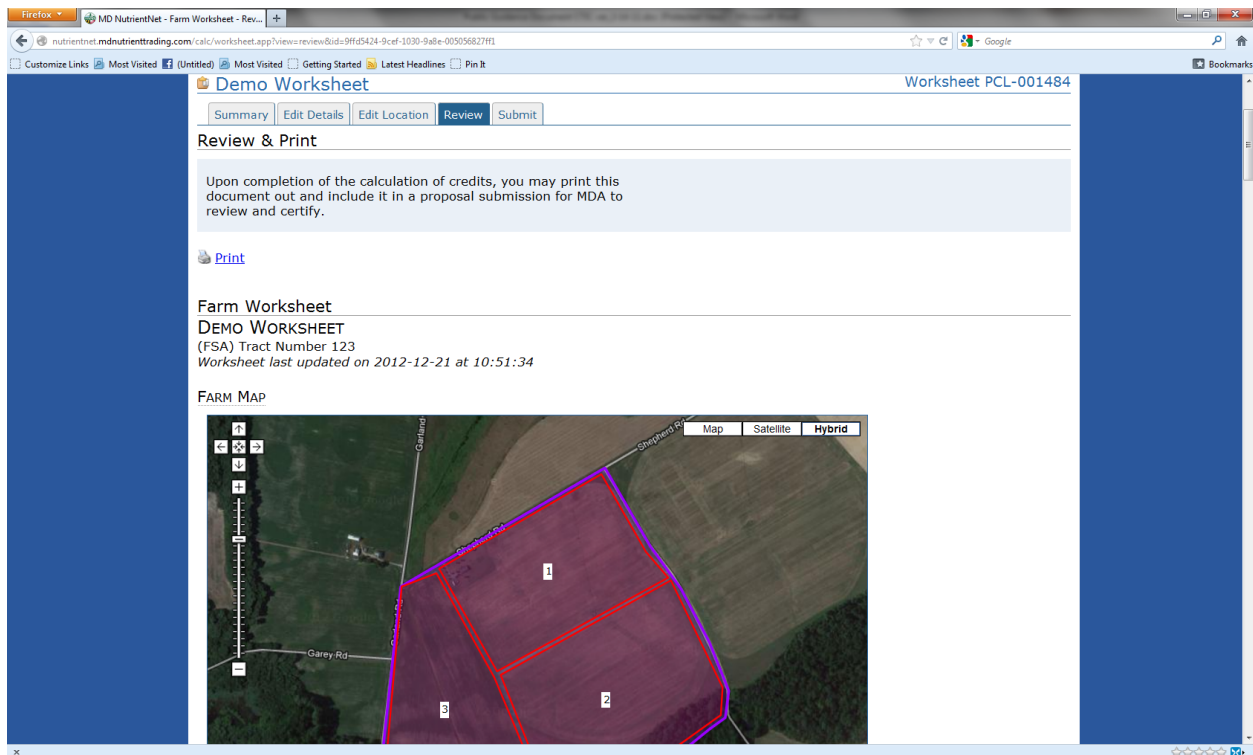
### Farm Overview

DETAILS	TOTALS
Farm name: Demo Worksheet	Farm area (from map): 94.91
(FSA) Tract number: 123	Farm area (sum of fields): 58.59
Farm notes: <i>n/a</i>	Number of fields: 3
Generator type: Landowner/Producer	Percent complete: 100%
Name: Farmer Smith	Buffered area: 4.13 ac
Address: 123 Gum Road	Wetland area: 0.00 ac
Address 2: <i>n/a</i>	Converted area: 0.00 ac
Location description: <i>n/a</i>	Farm meets baseline: Yes
City: Mytown	N reduction (EOS): 3,435.8 lb/yr
Zip code: <i>n/a</i>	N reduction to bay: 3,435.8 lb/yr
County: Talbot	N credits generated: 3,436 credits/yr
	P reduction (EOS): 10.2 lb/yr
	P reduction to bay: 10.2 lb/yr
	P credits generated: 10 credits/yr

### Field Listing

This farm's fields are listed below. To add a field, use the [Edit](#)

Clicking on “Return to Farm Summary” at the bottom of the *Future Nutrient Load* tab will take you back to the parcel *Summary* tab which will generate a summary of all credits generated (across all fields within the parcel).



Once you are finished, navigate to the parcel *Review* tab. This tab provides a snapshot of the map, and a summary of the inputs and BMPs on each field. This page is available in a printer-friendly format and can be printed off and submitted with your credit certification application to MDA.

# Managing and Trading Credits

MD NutrientNet - Nutrient Trading Program - Windows Internet Explorer provided by World Resources Institute

http://md-stage.nutrientnet.org/entity/project/list.asp

MD NutrientNet - Nutrient Trading Program

My Account | Calculate Credits | Trade Credits | User's Guide | Log Out

Overview | Posted Credits | Credits Needed | Bids Placed | Bids Received | Projects | Trades | Edit

Projects

All | Planned | Contingent on Sale | Implemented | Cancelled

Displaying 1-6 of 6

Project	Status	Credits			
		Initially Generated	Currently Owned	Currently Posted	In Seller Reserve
#PROJ-000010 - CTIC test Watershed Wicomico county Created on 03/03/2009	Planned, contingent on sale of credits	0	0	0	0
#PROJ-000011 - test Watershed Wicomico county Created on 03/03/2009	Planned, contingent on sale of credits	0	0	0	0
#PROJ-000013 - riparian forest buffer Watershed Wicomico county Created on 03/04/2009	Planned, contingent on sale of credits	2224	2116	100	0
#PROJ-000014 - riparian forest buffer Watershed Wicomico county Created on 03/04/2009	Planned, contingent on sale of credits	2224	2116	100	0
#PROJ-000015 - riparian forest buffer Watershed Wicomico county Created on 03/04/2009	Planned, contingent on sale of credits	332	316	100	0
#PROJ-000021 - Latest test Watershed Caroline county Created on 11/08/2009	Implemented	50	40	0	0

Once applications are reviewed, verified, and by MDA, certified credits are placed in your account. You can review a summary of all your certified projects in the *My Account* tab under *Projects*. This screen displays each of your certified projects, the initial number of credits generated, the number of credits owned, the number of credits currently on the marketplace, and the number of credits that have been bought.

MD NutrientNet - Nutrient Trading Program - Windows Internet Explorer provided by World Resources Institute

http://md-stage.nutrientnet.org/entity/posting/form.app

MD NutrientNet - Nutrient Trading Program

My Account | Calculate Credits | **Trade Credits** | User's Guide | Log Out

Nitrogen MarketPhosphorus MarketPost CreditsCredits Needed BoardCertified Credits by ProjectCompleted Trades

**Post Credits to the Marketplace**

Complete the form below to post credits to the marketplace.

**Select a Marketplace and Watershed**

Marketplace: ☒ Nitrogen Phosphorus  
Watershed: ☐ Patuxent Potomac EverywhOe Else  
Price Format: ☒ Specified Price Request for Inquiry

**Post Credits**

Enter a date, if any, that the posting should be removed from the marketplace:  
Posting Expiration Date:  mm/dd/yyyy

**Available Credits by Year and Project**

2009 - Enter Price per credit: \$

Project / Status	Available	Credits to Post	Total Price
riparian forest buffer Planned, contingent on sale of credits	1000	<input type="text"/>	\$0.00
riparian forest buffer Planned, contingent on sale of credits	1000	<input type="text"/>	\$0.00
riparian forest buffer Planned, contingent on sale of credits	100	<input type="text"/>	\$0.00
Total credits and price (2009):			0 \$0.00

2010 - Enter Price per credit: \$

Project / Status	Available	Credits to Post	Total Price
riparian forest buffer Planned, contingent on sale of credits	1000	<input type="text"/>	\$0.00

**Your Available Credits**

**Nitrogen**  
Potomac: 4240 credits

**Phosphorus**  
Potomac: 348 credits

To sell your certified credits on the marketplace, click on the *Trade Credits* tab and navigate to the *Post Credits* sub-menu tab.

MD NutrientNet - Nutrient Trading Program - Windows Internet Explorer provided by World Resources Institute

http://md-stage.nutrientnet.org/entity/posting/form.app

MD NutrientNet - Nutrient Trading Program

My Account | Calculate Credits | **Trade Credits** | User's Guide | Log Out

Nitrogen MarketPhosphorus MarketPost CreditsCredits Needed BoardCertified Credits by ProjectCompleted Trades

**Post Credits to the Marketplace**

Complete the form below to post credits to the marketplace.

**Select a Marketplace and Watershed**

Marketplace: ☒ Nitrogen Phosphorus  
Watershed: ☐ Patuxent Potomac EverywhOe Else  
Price Format: ☒ Specified Price Request for Inquiry

**Post Credits**

Enter a date, if any, that the posting should be removed from the marketplace:  
Posting Expiration Date:  01/01/11 mm/dd/yyyy

**Available Credits by Year and Project**

2009 - Enter Price per credit: \$  10.00

Project / Status	Available	Credits to Post	Total Price
riparian forest buffer Planned, contingent on sale of credits	1000	<input type="text"/> 100	\$1000.00
riparian forest buffer Planned, contingent on sale of credits	1000	<input type="text"/> 100	\$1000.00
riparian forest buffer Planned, contingent on sale of credits	100	<input type="text"/> 100	\$1000.00
Total credits and price (2009):			300 \$3000.00

2010 - Enter Price per credit: \$

Project / Status	Available	Credits to Post	Total Price
riparian forest buffer Planned, contingent on sale of credits	1000	<input type="text"/> 0	\$0.00
riparian forest buffer Planned, contingent on sale of credits	1000	<input type="text"/> 0	\$0.00
riparian forest buffer	100	<input type="text"/> 0	\$0.00

**Your Available Credits**

**Nitrogen**  
Potomac: 4240 credits

**Phosphorus**  
Potomac: 348 credits

First, select the appropriate marketplace—nitrogen or phosphorus—and trading basin. The trading tool will display all credits that are available for posting. Next, enter the credits from each project that you wish to include in your posting. Enter a number equal to or less than the available credits for each project

under the “Credits to Post” column. Postings can contain credits from multiple projects. You may specify a credit price for your posting, and different prices may be entered for different years. You may also choose to leave the credit price blank. You have the option to enter an expiration date for your listing. When all projects and optional notes are entered, click “Post Credits to Marketplace” at the bottom of the



page. After submitting credits to the marketplace, this page will appear showing your posting number and the total number of credits that were posted for sale. You can then choose from the menu which follows to modify the posting, create a new posting, or view the nitrogen or phosphorus marketplace.

MD NutrientNet - Nutrient Trading Program - Windows Internet Explorer provided by World Resources Institute

http://md-stage.nutrientnet.org/marketplace/list.app?nutrient\_id=1

MD NutrientNet - Nutrient Trading Program

**MARYLAND NUTRIENT TRADING**

My Account | Calculate Credits | **Trade Credits** | User's Guide | Log Out

[Nitrogen Marketplace](#) | [Phosphorus Marketplace](#) | [Credits Needed](#) | [Board Certified Credits](#) | [By Project Completed Trades](#)

**Nitrogen Marketplace**

Limit by Watershed and Year

Watershed: ☒ All Watersheds ☒ Patuxent ☐ Potomac ☐ Every ☐ Other Else ☐

Year: ☒ All Years ☐ 2010

Apply Filter

Nitrogen Credits in MDA Retired : 625

Year	Watershed	Posting #	Credits Available*	Price per Credit
<a href="#">View</a>	2007 Potomac Watershed	#POST-000002	500	\$10.00
<a href="#">View</a>	2008 Potomac Watershed	#POST-000002	450	\$10.00
<a href="#">View</a>	2009 Potomac Watershed	#POST-000003	100	\$10.00
<a href="#">View</a>	2009 Potomac Watershed	#POST-000009	10	\$10.00
<a href="#">View</a>	2009 Potomac Watershed	#POST-000010	300	\$10.00

+ Indicates a posting that you placed on the marketplace.  
 + Indicates a posting that you have submitted a bid on.

\* These are credits certified by the Department. Certification is the first step in allowing credits to be used to satisfy NPDES permit obligations. Certifications issued by the Department for credits are contingent on verification and registration, and possibly other conditions. Contact the Department if you would like to see the certification for any credits you are considering to purchase.

Maryland Department of the Environment  
 4000 Montross Drive, Baltimore, MD 21201

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 4000 Montross Drive, Baltimore, MD 21201

You may view your posting in the marketplace. There is a phosphorus and nitrogen marketplace. The marketplace lists all credits that are available for purchase. Each listing contains the year, watershed, posting number, credits available, and price per credit. A cross symbol is placed next to listings that you have placed on the marketplace.

MD NutrientNet - Nutrient Trading Program - Windows Internet Explorer provided by World Resources Institute

http://md-stage.nutrientnet.org/entity/posting/list.app

MD NutrientNet - Nutrient Trading Program

**MARYLAND NUTRIENT TRADING**

My Account | Calculate Credits | Trade Credits | User's Guide | Log Out

[Overview](#) | [Posted Credits](#) | [Credits Needed](#) | [Bids Placed](#) | [Bids Received](#) | [Projects](#) | [Trades](#) | [Edit](#)

**Posted Credits**

Currently on Marketplace | Expired | Removed

Displaying 1-1 of 1

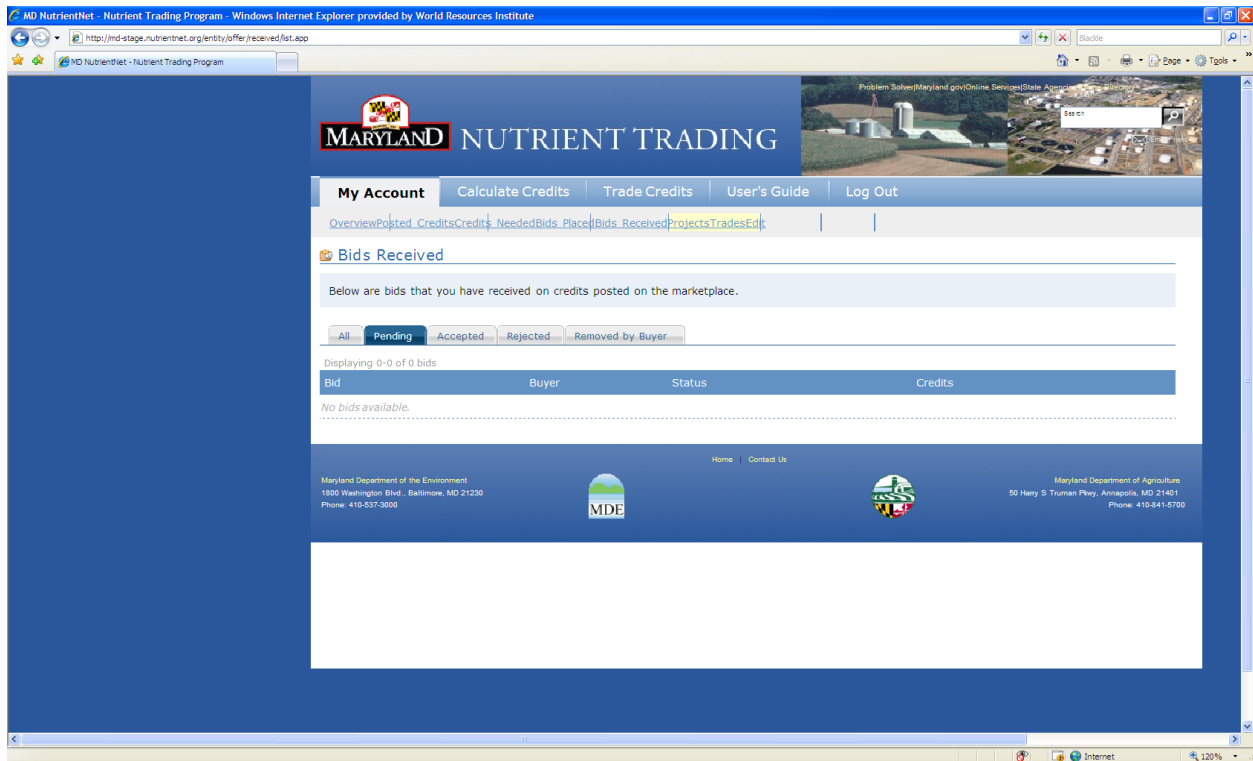
Posting	Pending Bids	Pending Trades	Certified Trades	Credits Initially Posted	Credits Remaining On Marketplace
#POST-000011 Nitrogen Marketplace Potomac Watershed Posted on 01/27/10 Open until 01/01/11	0	0	0	2009 - 300 credits @ \$10.00/credit	2009 - 300 credits @ \$10.00/credit

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 4000 Montross Drive, Baltimore, MD 21201

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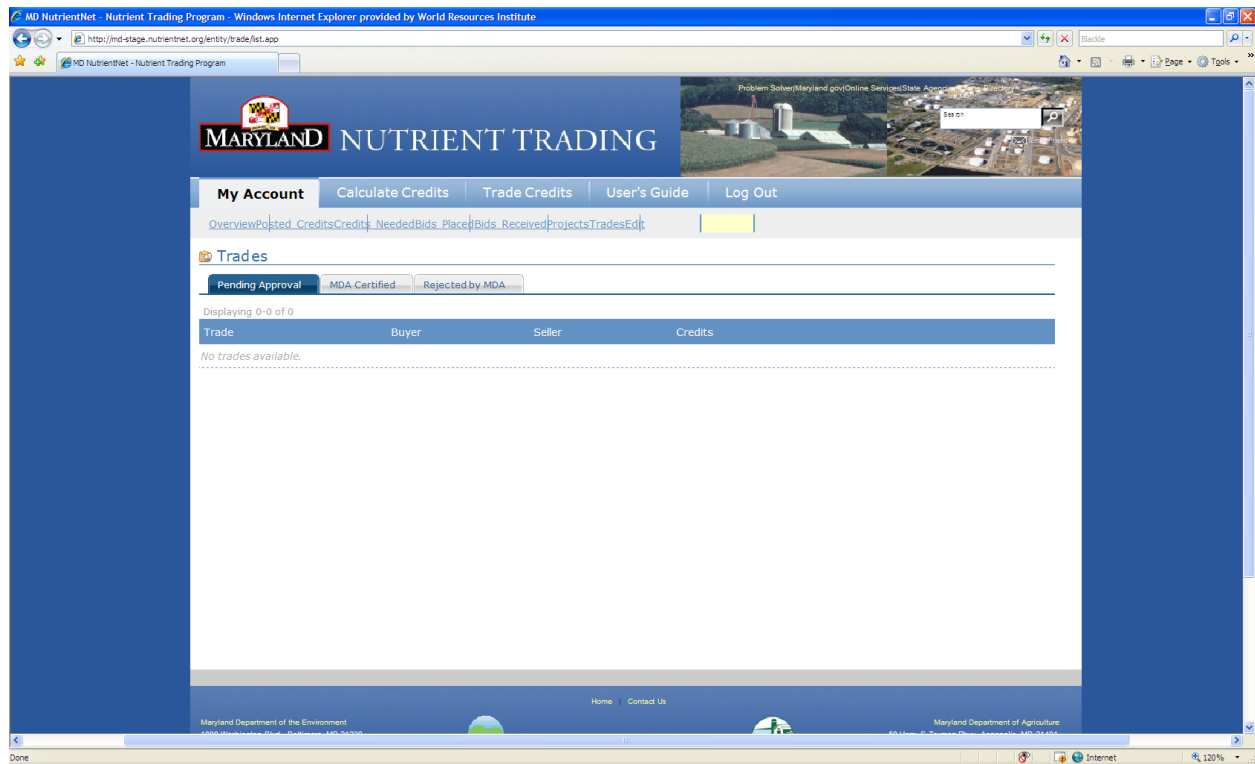
Maryland Department of Agriculture  
 4000 Montross Drive, Baltimore, MD 21201

To manage your postings and view expired postings, navigate to the *My Account* tab and click on “Posted Credits.” Here, you can see credits that are currently on the marketplace, have expired, and have been removed.



To check if any bids have been placed on your posted credits, click on the *My Account* tab, navigate to the *Bids Received* sub-menu tab, and look under the *Pending* sub-tab for a listing of any bids that have been made but not yet accepted or rejected. Click on the entry's bid number to read the details of the offer and accept or reject the bid. You can also review bids that you have already accepted or rejected bids by clicking on the respective tabs. Any new bids will also be displayed on your account dashboard which is the first screen you view once you log in.





If you accept a bid, it becomes a pending trade and is sent to the Maryland Department of Agriculture for review. You can check the status of all of your pending and completed trades by clicking on the *Trades* sub-menu item under the *My Account* tab. When MDA accepts a pending trade, the credits are automatically transferred from your account to the buyer's account, and a notification e-mail is sent to both parties.



## **Appendix B. Required Forms**

**Maryland Agriculture Nutrient Credit Certification and Registration Form**

**Trading Application Form**



# Maryland Agriculture Nutrient Credit Certification and Registration Form



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

1. Applicant Information: \_\_\_\_\_  
 First Name MI Last Name  
 \_\_\_\_\_  
 Company Name (if applicable) Title

2. Applicant Address: \_\_\_\_\_  
 Number Street  
 \_\_\_\_\_  
 Town State Zip

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

4. Property Address: \_\_\_\_\_  
 Number Street  
 \_\_\_\_\_  
 Town State Zip

5. Property Description (optional): \_\_\_\_\_  
 \_\_\_\_\_

6. Property County: \_\_\_\_\_ Watershed: \_\_\_\_\_  
 Tract Number: \_\_\_\_\_ Watershed Segment ID: \_\_\_\_\_  
 MD Property View Acct. ID(s): \_\_\_\_\_ Latitude: \_\_\_\_\_  
 \_\_\_\_\_ Longitude: \_\_\_\_\_  
 \_\_\_\_\_

7. Total Annual Credits Generated: \_\_\_\_\_ (N); \_\_\_\_\_ (P)  
 Total Years: \_\_\_\_\_

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

#	Land Conversion/Streambank BMPs	Acres
<input type="checkbox"/>	Wetland	
<input type="checkbox"/>	Land use conversion: hay	
<input type="checkbox"/>	Land use conversion: grass	
<input type="checkbox"/>	Land use conversion: forest	
<input type="checkbox"/>	Land use conversion: perennial crop*	
<input type="checkbox"/>	Forested buffer/fencing	
<input type="checkbox"/>	Grass buffer/fencing	
<input type="checkbox"/>	Streambank restoration	Feet

#	Field Management BMPs	Acres
<input type="checkbox"/>	Conservation tillage*	
<input type="checkbox"/>	Continuous no-till*	
<input type="checkbox"/>	Enhanced nutrient management*	
<input type="checkbox"/>	Decision agriculture	
<input type="checkbox"/>	Water control structure	
<input type="checkbox"/>	Cover crop*	
<input type="checkbox"/>	Commodity cover crop*	Type
		Type



#	Livestock Area BMPs	#	Pasture BMPs	Acres
<input type="checkbox"/>	Clean water diversion	<input type="checkbox"/>	Alternative watering facility	
<input type="checkbox"/>	Heavy use area protection	<input type="checkbox"/>	Horse pasture management	
<input type="checkbox"/>	Heavy use area pad	<input type="checkbox"/>	Prescribed grazing/PIRG	
<input type="checkbox"/>	Runoff collection & infiltration	<input type="checkbox"/>	Fencing (forest buffer)	
<input type="checkbox"/>	Vegetated swales	<input type="checkbox"/>	Fencing (grass buffer)	
<input type="checkbox"/>	Water control structure			
<input type="checkbox"/>	Treatment wetland			

#	Ammonia BMPs	Manure Management
<input type="checkbox"/>	Lagoon cover	Dairy precision feeding*
<input type="checkbox"/>	Poultry litter treatment	Manure export*
<input type="checkbox"/>	Biofilters	Poultry/swine phytase*
<input type="checkbox"/>	Vegetated environmental buffers	Manure injection*

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

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

---



---

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

---



---

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

---



---

12. Compliance Statements:

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

or

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

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

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

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

14. Signature: \_\_\_\_\_ Date: \_\_\_\_\_

**Send completed form and any accompanying materials to:**

Maryland Department of Agriculture  
Resource Conservation Operations  
Attention: Nutrient Trading Program  
50 Harry S. Truman Parkway  
Annapolis, MD 21401

**Public Information Notice**

Your application cannot be processed unless all of the requested information and accompanying documents have been supplied. These materials will be used by the Maryland Department of Agriculture to confirm the applicant's eligibility to participate in the Maryland Nutrient Trading Program, verify existing and planned BMPs, and certify and register tradable credits. You have the right to inspect, amend, or correct any information provided. Under State Government Article, §10-611 et seq., Annotated Code of Maryland, the information contained in your application and documents may be available for public inspection. This information is not routinely shared with the general public or state, federal, or local governmental agencies.

**For Department Use Only:**

Application Received: \_\_\_\_\_ (Date)                      Registration # \_\_\_\_\_

\_\_\_\_\_  
Name of Verifier                      Signature                      Date

Credits Approved: \_\_\_\_\_ (N) \_\_\_\_\_ (P) \_\_\_\_\_ (Certifier)

Reason for Non-approval:

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_



# Trading Application Form



## Maryland Nutrient Trading Program Trading Application



Date:

Owner/ Aggregator:   
 Contact Person:   
 Contact Number:   
 Trading Basin:

Buyer/ Facility:   
 Permit Number:   
 Contact Person:   
 Contact Number:

Duration of Contract in Years:	<input type="text"/>
Project ID Number:	<input type="text"/>
Nitrogen Credits per Year:	<input type="text"/>
Registration Numbers:	<input type="text"/>
Phosphorus Credits per Year:	<input type="text"/>
Registration Numbers:	<input type="text"/>
Project ID Number:	<input type="text"/>
Nitrogen Credits per Year:	<input type="text"/>
Registration Numbers:	<input type="text"/>
Phosphorus Credits per Year:	<input type="text"/>
Registration Numbers:	<input type="text"/>

Source of Credits: Proposed Credit Reduction Methods/ BMPs:

Method for Determination of Number of Credits:

Contract with required provisions must be attached. Any provisions outside the scope of those required may be kept confidential.

Submissions to the Maryland Department of the Environment must be accompanied by a copy of the approved Nutrient Credit

Certification and Registration Form from the Maryland Department of Agriculture

All credit purchases are subject to a 10% retirement ratio, and those additional credits will be permanently retired by the State of Maryland.

Maryland Department of Agriculture  
 Resource Conservation Operations  
 Attention: Nutrient Trading Program  
 Harry S. Truman Parkway  
 Annapolis, MD 21401



Maryland Department of the Environment  
 Wastewater Permits Program  
 Attention: Edwal Stone  
 1800 Washington Boulevard  
 Baltimore, MD 21230