

# Adams County Conservation District

## Chesapeake Bay County Implementation Plan



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## **Introduction**

Located in the south central portion of Pennsylvania, Adams County is approximately 333,000 acres in size and, according to the 2000 census, had a population of 96,456 (U.S. Census). Adams County has more than 1,319 miles of streams stretching into two watersheds - the Potomac and the Susquehanna - both of which drain into the Chesapeake Bay. The Potomac portion of the County covers 164,087 acres and was completely assessed in 1999 by the Interstate Commission on the Potomac River Basin (ICPRB). The assessment determined that over 61 miles of streams in the Potomac watershed were impaired by agriculture. Only a very small portion of the Susquehanna watershed has been assessed to date. This small assessment identified 32 miles of agriculturally impaired streams – (see state water plan 07F and 13D).

Watersheds and water quality in Adams County are heavily influenced by the agricultural industry and suburban sprawl. In order to address these issues, the Adams County Office of Planning and Development is currently preparing an update of the county's 1990 Comprehensive Plan. This process will take place incrementally in a three to four year period that began in 2004. "The Adams County Office of Planning and Development prepares countywide planning policies and conducts implementation programs designed to guide community building and resource conservation in Adams County. Planning initiatives focus on long-range land use, transportation, and resource protection policies, medium-term implementation activities, and short-term efforts to effectuate the best possible community design and conservation decisions." An integral part of this update in the County's Comprehensive Plan was a random sample survey sent out in May 2003. The survey identified preservation of farmland and the future water supply to be two of the top three most important concerns of those surveyed. The survey also identified agricultural jobs as ranking in the top three jobs most needed in Adams County in the future (Adams County Planning Office).

## **The Status of Agriculture in Adams County<sup>1</sup>**

Adams County is best known for its fruit production. Roughly 65% (300 million lbs./\$30 million) of the apples grown in PA are grown in Adams County. This amounts to over 3% of the nation's production of apples. According to the most recent National Agricultural Statistics Service (NASS) survey, Adams County had 1,260 farms and orchards covering 179,000 acres (see graph 1). This is equal to 54% of the land in Adams County. This is a 9% decrease, or a loss of 17,800 acres, in farmland since 1988. Twenty-two percent of the farms in PA are located in Adams County. NASS listed Adams County as having 470 cattle operations, 160 orchards, 144 poultry operations, 60 commercial dairies, and 55 hog operations. The average farm size in the County is 142 acres. Most are small scale livestock or are producing strictly crops (see farm sizes graph 1). There are a total of 1,883 farmers and fruit growers in the county according to NASS. The Farm Service Agency (FSA) estimates that 80% to 90% of the County's farmers participate in United States Department of Agriculture (USDA) programs.

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<sup>1</sup> All figures used were acquired from the 2007 National Agricultural Statistics Service (NASS).

Of these operations, 32 participate in the Nutrient Management Program, covering roughly 9,000 acres of the County.

### **Livestock**

According to the statistics from NASS, every type of livestock in Adams County, with the exception of layer chickens - which have increased, and turkeys - which we don't have historical data to draw conclusions from, has declined in numbers over the past 30 years(see graph 2). There were 29,800 beef cattle in Adams County in 2007. This is a decrease of 26% from 1975. Dairy cow numbers are down 33% since 1982, to 7,300 cows in 2007. However, the number of dairies in the County has decreased by nearly 50%. This clearly indicates that the remaining dairies have increased their animal density. It is also worth noting that the County had the highest producing cows in the state in 2007, producing an average of 21,438 lbs of milk per cow. Milk production is directly related to manure production. This means that cows in Adams County produce more manure, on average, than any other county in the state.

Hogs reached a low of 18,800 animals in 2007. This is down 27% from their peak in 1980. Since a 1982 peak of 6,300,000, broiler numbers in the county have declined by 88% to 730,000 in 2007. The only animal type to see its numbers increase over the last 27 years is layer chickens. There were 1,750,000 layers in 2007, up 10% from 1978. According to NASS, Adams County has the fourth highest number of layers in the state and ranks fourth in egg production. Turkey numbers are not listed in the agricultural statistics from 1982, so we don't have historical information on their numbers. However, based on conversations with the largest contract grower in the county, Pilgrim's Pride, their numbers in the County dropped from 3.12 million birds in 1994 to 2.52 million birds in 2004 (see graph 2 for % changes).

### **Crops**

In Adams County, in an average year, 36% of crop ground is in corn grain, 30% in hay, 13% in soybeans, 13% in wheat, and 8% in corn silage. Adams County also has 72 orchards, covering 17,219 acres, and boasts the highest apple and peach production in the state, according to the NASS (see chart 1). In 2006, 22.7 million dollars of forage crops, 0.92 million dollars of vegetables and 43.9 million dollars of fruit were harvested from Adams County land.

According to our calculations using conservative estimates, approximately 47% of the crop ground in the County is no-tilled or in hay, with the vast majority of the remainder being in reduced tillage. When conservation plans are written for farmers in Adams County, tolerable soil loss, or T, can usually be achieved by cropping rotation alone. It is important to note that the large amount of hay production in Adams County typically results in compliance with Chapter 102 E&S regulations without an operator having to install structural practices in the field or make managerial changes, i.e. cover cropping and no-till systems.

### **Summary**

The statistics show a decrease in farms, farmland and farmers. In addition, livestock numbers, with the exception of layers, have also decreased. However, in analyzing the statistics it is clear that nutrients application rates are not balanced with

nutrient removal rates by crops in Adams County (see graph 3). Due to the high nutrient content of poultry manure, coupled with the high density of dairy animals, there is a definite need to more evenly distribute manure nutrients across every operation and the county as a whole. Finding ways to balance nutrient applications with crop removal rates is vital to implementing the nutrient management program in the County. The lack of Best Management Practice (BMP) funding and staffing means that new and innovative ways must be created to achieve nutrient load reductions.

## **Adams County Chesapeake Bay County Implementation Plan**

The District is proposing a strategy that addresses what we see as the most critical nitrogen, phosphorus, and sediment problems in the county. The success, or failure, of our plan is directly contingent upon the financial and technical assistance provided to us. If adequate funding is not secured, we will not be able to successfully implement our plan.

### **Past Accomplishments**

Since 1985, the District and landowners/farmers have spent almost \$2,525,000 to put best management practices (BMPs) on the ground through the Chesapeake Bay Program. These include:

<ul style="list-style-type: none"> <li>• 64 Waste Storage Structures</li> <li>• 258 Acres of contour farming</li> <li>• 44 grassed diversions</li> <li>• 138 grassed waterways</li> <li>• 15 heavy use protection areas</li> <li>• 1,545 Acres of contour strips</li> </ul>	<ul style="list-style-type: none"> <li>• 1,326 Water control structures</li> <li>• 35 terraces</li> <li>• 370,335ft of tile drainage</li> <li>• 97 underground outlets</li> <li>• 18 Roof Runoff Systems</li> <li>• 95 Nutrient management plans</li> </ul>
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The Environmental Quality Incentives Program (EQIP) and the Conservation Reserve Enhancement Program (CREP) have also been used to get BMPs installed in Adams County. Since 2002 the District has assisted The United States Department of Agriculture (USDA) through the Natural Resource Conservation Service (NRCS) with the installation of:

<ul style="list-style-type: none"> <li>• 34 Manure storages</li> <li>• 11 Diversions</li> <li>• 32 Grassed waterways</li> <li>• 29 Water control structures</li> <li>• 36 Underground outlets</li> <li>• 41 Drain tile systems</li> <li>• 1 Composting facility</li> </ul>	<ul style="list-style-type: none"> <li>• 5 Heavy Use Protection Areas</li> <li>• 9 Roof runoff systems</li> <li>• 5 Spring developments</li> <li>• 7 Terraces</li> <li>• 150 Acres of filter strips</li> <li>• 500 Acres of riparian buffers</li> <li>• 16 Acres of wetland restoration</li> </ul>
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The District has also worked with the following groups to install many of the same BMPs listed above: Growing Greener, Chesapeake Bay Foundation, Regional Riparian

Initiative, Project Grass, PACD, AMA, Watershed Alliance of Adams County, and the Marsh Creek Watershed Protection Project

It is clear by the BMPs and projects listed above that the District takes a whole-farm approach when using cost-share money. All problems on a farm are identified, and where and when possible, these problems are fixed. The District is proud of its past accomplishments and continues to offer technical, financial, and educational assistance to landowners, which will result in the continued conservation of our soil and water resources.

### **No-Till Farming**

The tight, shaly, wet clay soils common in Adams County (see map 1) present a challenge to farmers as they try to convert to no-till farming. However, that is not stopping the District from aggressively pursuing the expansion of no-till farming in the County. No-till farming, when implemented properly, is proven to reduce the amount of nutrient and sediment runoff from crop fields and can also aid in carbon sequestration. In addition, we strongly believe that no-till farming practices will greatly improve soil quality and organic matter content in Adams County.

The District has surveyed the tillage practices of farmer in the County each of the past three years. These surveys show a remarkable increase in the amount of no-till farming done in Adams County. The 2005 survey indicated roughly 13,345 acres of no-till land in the County. This represented 47% of the total acreage reported. In 2006, the survey showed at least 17413 acres of no-till farmland. This represented almost 79% of the total acres reported in the survey. The 2007 survey reported almost 26,000 acres of no-till farming in the County. In the span of two years, farmers increased the amount of no-till farming in the County by 95%. This was accomplished, in great part, by the dedication and efforts of the District staff in educating farmers and by seriously promoting no-till farming. The District has been very successful in convincing farmers to convert to no-till farming with virtually **no financial inducements** offered to them. We believe that this is the best way to continue expanding no-till practices in the County and we will continue to lead the way in the implementation of no-till farming.

- The primary goal of Adams County Conservation District is to **promote and educate** the farming community about the benefits of no-till farming. This is part of our stated broader goal to encourage and support agricultural operations by providing technical, financial, and educational assistance to farmers in order to protect and enhance the quality of land and water resources through the practice of good natural resource conservation techniques. It is the philosophy of the District that we should not pay farmers to no-till or cover crop. The District believes that it is our responsibility to promote and educate farmers about the benefits of no-till and cover crops on their own merits, without any financial inducements from the government. The District understands that we cannot pay farmers ad infinitum and that it is, therefore, counterproductive to rely on payments to convince farmers to no-till. With that in mind, the District held its 5<sup>th</sup> Annual No-Till Conference in February 2009. We strive to provide the farmers of Adams County with the best speakers and information available. These meetings

have been attended by over 100 farmers from the Adams County the past 3 years. Over the past five years we have seen interest in the meetings increase every year and we continue to attract top-notch speakers from across the country. Each year the meetings have been attended by many first-time no-tillers. We are committed to providing the best possible no-till meetings for the farmers in the County and will look to expand the meeting next year. The District also used PACD funding to send farmers to the National No-Till Meeting in 2005 and continues to actively promote the National No-Till Meeting. We will continue to hold these annual meetings to inform farmers of the latest innovations and updates in no-till farming. We believe that this will increase the adoption of **long-term no-till** farming in the County.

- An important part of the annual no-till meetings are our **no-till and cover crop surveys**. The surveys have shown a 101% increase in the amount of no-till farming done from crop year 2004 to 2007. This represents over 35,000 acres of no-till in crop year 2007. The district, in conjunction with Capitol Region RC&D and Park the Plow, also performed a **residue survey** in 2007. This involved visually inspecting a large percentage of the fields in the County. This survey confirmed the results of our no-till surveys and showed us where the County needs to work on the adoption of no-till farming. The residue survey showed that 68% of crops in Adams County were planted no-till. This was the highest level of no-till adoption in the south-central region. The District believes that this is a small confirmation of our current strategies for increasing the amount of no-till farming. However, we remain committed to seeing 100% of the farmland of Adams County in **long-term no-till**.
- In our conversations with farmers across the County, we have found that a lack of access to no-till equipment is a major impediment to farmers trying no-till farming. Many farmers are not ready to take the risk of buying new equipment that they cannot easily afford in order to implement a farming system that they are unfamiliar with and unsure about. Smaller farmers, in particular, have few options when looking for no-till equipment because of the relative inefficiency of hiring a custom planter to plant small acreage. We believe that if the District can remove the barrier of new equipment costs many new farmers will try, and ultimately adopt, no-till farming. The District will explore ways of **expanding access to no-till equipment**. To that end, the District has used Bay Special Project funding to reimburse the rental costs of a no-till drill.

We are also engaging farmers to **retrofit existing no-till equipment** with the different coulters, gauge wheels, and closing wheels of the “no-till” system. In particular, we are working with farmers to switch to spiked closing wheels. The district was instrumental in getting no-till operators in the County to try the spiked closing wheels and they have been very pleased with the results. Dozens of farmers have now switched to these closing wheels and we believe that the success of these farmers speaks for itself and will further expand the use of this equipment by farmers. We will continue to promote new and innovative no-till farming equipment and methods by making it less risky for farmers to try new

things. We are also assisting farmers to use REAP(see page 15) to help them purchase no-till equipment

We also understand that it is vitally important for no-till equipment to be set up and functioning properly. This is essential to farmers believing that they can thrive in a long-term no-till system. The district is firmly committed to making no-till work for **every farmer** in the county and believes that this will directly reduce the amount of nutrient and sediment pollution that enters the waters of Adams County.

- The use of **cover crops** is a very effective way to keep nutrient rich runoff out of the waters of the Chesapeake Bay. The roots of these crops work to keep the soil in place during periods of intense rain and also soak up nutrients in the soil that could potentially run-off into surface water or leach into ground water. By taking up nutrients and then releasing them to a crop that is planted in the spring, cover crops will increase the utilization of nutrients from manure and will decrease the need for added fertilizer. A good cover crop will protect the soil surface from the damaging impact of raindrops. In addition, they improve the soil quality by breaking up compaction, improving soil tilth, and adding organic matter to the soil. Cover crops also increase earthworm activity, which increases the amount of pores in the soil, thus increasing infiltration. Cover crops are a vitally important element in successful **no-till farming**. The District strongly believes that increasing the use of cover crops in Adams County will result in a marked improvement in water quality.

The District has cooperated with various farmers across the County to experiment with other cover crop options. Farmers in the County are increasingly interested in cover crops that will add nitrogen to their soil, thus reducing the need to add N fertilizer to the following row crop. In addition, adding legume cover crops to a standard crop rotation has been shown to dramatically improve soil quality and health. The District is particularly interested in expanding the use of cover crop mixes and “**cocktails**” (several different types of species growing at the same time). The symbiotic relationships between the different species has been shown to dramatically increase yields and works to improve overall soil health by adding diversity to a crop rotation. This diversity can also reduce the need for expensive pest management.

The District is actively pursuing **aerial seeding** of cover crops as a solution to late planting windows. It is often too late in the growing season for farmers in County to plant a cover crop after soybean harvest. Aerial seeding into standing soybeans or late-season corn is an enticing solution to this problem.

- The District has partnered with the Watershed Alliance of Adams County, with financial assistance provided by a DEP Growing Greener grant, to make a 10-foot **Aerway aerator** available to farmers to rent for a nominal per acre fee. We have also contracted with a large manure hauler in the County to cost-share, with farmers, the price of using a 20-foot Aerway from the hauler. Use of the aerator will reduce compaction on fields, whether pasture, hay, field crops or orchards, while increasing the soil’s ability to infiltrate water and fertilizers. This will

reduce the loss of valuable nutrients to the environment and will prevent nutrient runoff from entering our streams. When used in conjunction with manure application, manure incorporation is greatly increased, thus reducing the potential for pollution of streams in Adams County. The increased infiltration will help soil retain moisture and encourage groundwater recharge. We also believe that the Aerway is a valuable tool in long-term no-till farming.

- Wet soils make it difficult to plant in the spring and are easily rutted by machinery in the field at harvest. To deal with these conditions, producers in the County feel that they need to plow in the spring to dry soils and plow in the fall to fix ruts made during the harvesting of crops. **Tile drainage** can help to dry problem areas in a field in the spring and fall, thus reducing the need to plow. In addition, tile drainage can be used to control seasonal springs that cause gully erosion in fields. These gullies are then plowed shut and subsequently erode the following year. One of the options that the District is exploring is cost-sharing the installation of tile drainage in exchange for a contract with the farmer to no-till that field for a minimum of 10 years. We will continue to explore different funding options for tile drainage that can be used in conjunction with continuous no-till operations.

### **Agricultural and Crop Land BMPs\***

While we believe the increase in no-till farming has greatly decreased soil erosion in Adams County, the District continues to focus on traditional erosion control BMPs, such as grassed waterways, terraces, diversions, and contour strips to alleviate rill and gully erosion. We plan to increase our focus on these measures in the coming years by applying for CBP Special Project funds for the installation of these BMPs. The intense winter rains that we have seen in recent winters have made the need for these BMPs plainly evident to us – particularly in soybean fields. The District has been and will continue to be very active in identifying erosion problems across the County and in approaching farmers and landowners with solutions to the problem.

The District is also convinced of the continuing need for barnyard and manure management systems. There are several operations in the County that have serious ACA management issues that require the District technical assistance. We continue to look for any all funding options to deal with some of these concentrated problems.

BMPs such as **grassed waterways, diversions, terraces, stream bank fencing**, are the tools that we need to effectively reduce nutrient runoff and crop land erosion. These are the methods that the District has traditionally used to address gully and ephemeral erosion in farmer's fields. The amounts of sediment and phosphorus that erosion control structures, in conjunction with proper agronomic management, is well documented. We will also assist NRCS in their administration of EQIP.

With the current full-farm approach, it has become very difficult for an operation needing single and small projects such as waterways, diversions, terraces, etc to rank high enough to receive cost-share funding. Field practices such as these are the basic soil conservation practices that conservation districts and NRCS have been installing for years. These practices are often overlooked as today's programs emphasize nutrient

management related BMPs such as manure storages, barnyards, and other livestock practices. The District will apply for funding specifically for the installation of these types of erosion control field practices in both County watersheds, the Potomac and the Susquehanna. According to the Pennsylvania Department of Environmental Protection (DEP), these watersheds have 61 miles and at least 32 miles of agriculturally impaired streams, respectively (see state water plan 07F and 13D). Proven erosion control field practices can greatly reduce the nitrogen, phosphorus, and sediment loads to the Bay and go a long way in advancing the County toward its nutrient reduction goals. In addition to the above BMPs, the District will also focus its efforts on the installation of the following:

- The District has made the installation of **riparian/vegetative buffers** along stream corridors, waterways, and road side ditches a high priority. These buffers also double as a permanent setback during that will protect waterways during manure spreading. The District also actively promotes the CREP program and uses it in conjunction with other BMPs whenever possible.
- The District is interested in **flexible fencing options** for livestock farmers in the Adams County. In some cases, farmers are reluctant to fence animals out of streams due to other requirement of the various fencing programs. We believe that there are many environmental benefits from simply fencing the animals out, regardless of the buffer width or what plants the buffer is comprised of. The District would target farmers in impaired watersheds for the installation of fencing, protected crossing and alternative water systems. The District is cognizant of the possibility of future stream bank fencing regulations and will always strive to help farmers stay ahead of the curve. In addition to nutrient pollution from manure deposition directly in the stream, stream bank fencing can drastically reduce erosion caused by physical damage from animals.
- There is a growing need in the County for **horse pasture management** that must be addressed by the District. In many situations, we often see far too many horses on too few acres of seriously overgrazed and degraded pasture. This is a situation that not even the best BMP in the world can fix. We will work to educate horse owners about pasture management and sustainable land use through field days and farm visits. In addition, Act 38 now applies to horse owners. We will work to educate horse owners on this change and how it will affect them. In addition, we will work to fund BMP project with horse owners whenever applicable. This will result in significant progress toward reducing the number of degraded pastures and the pollution that results from these lots.
- The District firmly believes that **waste management systems and ACA treatment systems** are vital in our efforts to improve water quality in the County and Bay watershed. We will continue to provide assistance to farmers as they deal with these issues and we will assist NRCS as we cooperate in trying to tackle some of these (often) costly problems in the County.

- As was stated earlier, 85 to 90% of the farmers Adams County participate in FSA programs and have **conservation plans** on file with NRCS. There is no easy way of knowing if the plans are being implemented properly or are up-to-date. In most cases, a crop rotation that has hay in it is enough to meet soil loss requirements as directed in Chapter 102. Thus, writing conservation plans simply to document existing field conditions results in very little water quality improvement. Therefore the District has not made this a high priority. However, the District has recognized the importance of conservation plans to farmers as they attempt comply with state and federal regulations and as they attempt to navigate the requirements of a vast array of programs. Thus, the District is committed to focusing our efforts on meeting the farmers' needs in the area of Conservation Plans. The District will continue to make certain that plans are written or updated for any landowner receiving financial assistance through State or USDA programs.
- There is a significant reduction of erosion from a field whenever tilled ground can be placed in permanent grass. The District is working with farmers and other landowners to **convert cropland to pasture**. The cost of fencing, watering systems, and stream crossings are minimal when the nitrogen, phosphorous, and sediment reductions they provide are taken into account. We are working with through District initiatives to increase the amount of land that is in permanent grass.

### **Agricultural Compliance Policy**

It is the goal of the District that all farms within Adams County are in full compliance with DEP regulations regarding manure management, nutrient management and erosion and sediment control. To that end, Adams County has adopted an Agricultural Compliance Policy.

The Compliance Policy will direct the actions taken by District staff in the event that a complaint is received concerning an agricultural operation in the County. Once a complaint is received, ACCD staff will investigate the complaint within three days. If the complaint is deemed to be valid, the staff will contact the responsible party and use the following criteria in evaluating whether any corrective action is necessary:

1. Did the violation result in a significant threat to life, health, property, or the environment?
2. Was the violation reported by someone other than the responsible party?
3. Did the responsible party ignore opportunities to quickly correct the problem?
4. Is the violation ongoing with no attempt by the responsible party to resolve it?
5. Will enforcement action be a deterrent to future non-compliance?
6. Has the responsible party realized a financial benefit as a result of the violation?
7. Was the violation a result of willful, reckless or negligent actions by the party?
8. Does the violator have a prior history of non-compliance within the past 3 years?

If the conservation District staff answers yes to question 1 and/or yes to any other 2 questions above, the Adams County Conservation District Ag Committee will be contacted to determine a course of action. If immediate action is deemed necessary, the staff will contact the appropriate agency. In all cases, it is the District's goal to assist the responsible party in coming into compliance in a timely manner. If compliance is not obtained in this way, the Ag Committee will make recommendations to the ACCD Board in regards to referring the situation to the appropriate state agency.

\*According to the Chesapeake Bay Commission, in their publication titled "Cost-Effective Strategies for the Bay", there are seven practices considered to be the most cost effective BMPs for reducing nitrogen, phosphorus, and sediment loads to the Bay. Every practice that is listed in our plan fits into at least one of the seven BMPs listed in the Commission's paper (Chesapeake Bay Commission, 2004). Traditional and enhanced nutrient management, conservation tillage, and cover crops can all be incorporated, in some way, into the BMPs mentioned in our plan. A majority of the BMPs that we are proposing do not have NRCS practice codes and therefore have no way of being tracked. With funding sources diminishing, there will be fewer structural practices installed in the near future. This will need to be replaced by more education and outreach to the community if further improvements in water quality are to be attained. However, with no way to record any nitrogen, phosphorus, and sediment load reduction to the Bay that may occur as a result, a tracking system, along with a future long term funding source, needs to be established. The District cannot be expected to meet the terms of our contract if there is no adequate BMP tracking system being used uniformly by every County in the PA portion of the Chesapeake Bay watershed.

### **Nutrient Management/Manure Management**

The livestock living in Adams County produces roughly 399,376 tons of manure per year. Using book values, this manure contains approximately 4,214,223 lbs of nitrogen and 7,553,837 lbs of phosphorus. In an average year, the crops planted in the fields of Adams County use 10,920,500 lbs of nitrogen and 4,438,850 lbs of phosphorus. Consequently, nitrogen applied to fields in manure does not exceed crop needs(see graph 3). Phosphorus, however, is applied in significant excess of crop needs (see graph 3).

With more animals on fewer farm acres, the utilization of manure nutrients is a growing concern in Adams County. As was stated earlier, the difference between nutrients available to the crop from manure and actual crop need is growing. Less ground for farming equals fewer crops planted and less manure nutrients utilized. Operations are either left with excess manure or manure is over-applied and the valuable nutrients go to waste - lost to the atmosphere, leached to groundwater, or lost to surface runoff. Far too often, the fields closest to the operation receive more manure than the crop needs. Additionally, as storages fill up during times when land application is not possible due to wet conditions, higher and drier fields may see heavy application rates or even multiple applications. This results in excess nutrient loads on those fields. A fully implemented nutrient management plan addressing these concerns is essential for the proper application of manure across the entire operation. To aid in the distribution of manure the District will do the following:

- improve the stacking and protection of dry manure on fields for more efficient spreading by producers and easier hauling by importers
- expand the ability to apply manure in fields through no-till farming techniques
- expand the use of riparian and vegetated stream buffers to reduce nutrient runoff

- improve the transport of liquid manure to distant fields by reducing the amount of clean water that enter waste storage systems
- find alternative uses for manure and explore the use of manure digesters
- better distribution of nutrients through manure/waste water irrigation pivots
- education concerning precision feeding

Listed below are some of the services that the District provides in our efforts to accomplish these goals.

- The **calibration of manure spreaders** is a valuable tool that allows a producer to accurately know how much manure is being spread per acre. This information is vital to developing and implementing a nutrient management plan. In order to assist farmers by providing accurate and easy manure spreader calibrations, the District has purchased a set of scales. Manure spreader calibrations help to enhance the level of nutrient management planning at each farm. Knowing the weight of a fully loaded manure spreader will also help heighten the producer's awareness of compaction problems with their soils. The scales can also be used to gather crop-yield data that can be used in precision agriculture.

Limiting the over-application of nitrogen to crop land and the possible loss of nutrients to the surrounding environment is a primary goal of the District. Accurately assessing the nutrient needs of a crop and applying those nutrients at optimal times will result in water quality improvements.

- The District has aggressively used the **pre side-dress nitrogen test (PSNT)**(see Appendix-Chart 2) and the chlorophyll meter to accurately assess a crop's nitrogen need. The District performed **PSNTs** for County farmers at no cost and will continue to provide this service. By only providing the crop what it can use at the time of application, split applications prevent nitrogen loss to the environment due to over-application or untimely application.

The **chlorophyll meter** is an accurate way to test the nitrogen needs of a crop at a specific growth stage vital to corn plant. The District purchased two chlorophyll meters and offers testing to farmers for free. Testing corn at a specific growth stage allows for accurate nitrogen readings immediately prior to applying a side dress fertilizer. However, the use of the chlorophyll meter is contingent upon a farmer applying less than 15 pounds of nitrogen as starter fertilizer. This is a highly unusual farming practice in the county and we are educating farmers about the chlorophyll meter and applying nitrogen when it is most needed by the plant. Split applications of nitrogen based on the chlorophyll meter readings will result in less nitrogen lost to the environment in a heavy rain or other weather event. This saves the farmer money. The District will aggressively promote limited use of starter fertilizer coupled with tissue testing and sidedress applications at the most beneficial times. Using the PSNT and chlorophyll meter not only has the potential to prevent nitrogen loss but can also reduce nitrogen applications and increase crop-yields.

- The district is covering the cost of **end-of-season cornstalk testing** to evaluate nitrogen management by the farmer. The test is an extremely valuable learning tool for both the farmer and the District. The test measures the nitrate concentrations in the corn stalk to determine if the plant was supplied with less-than-adequate, adequate, or excessive amounts of nitrogen during the season. This information can be used by the farmer to adjust fertilizer applications to more accurately reflect the needs of their crop. Historically, the test has shown that almost 75% of fields should have the level of nitrogen applied to them adjusted. Most of the adjustments would be a reduction in nitrogen applied to the field. The District can use this information to fine-tune recommendations made to farmers based on the PSNT and chlorophyll meter test that we run during the growing season. In 2006, we had 18 farmers utilize the end-of-season cornstalk nitrate test. Due to the extreme drought in 2007, the District did not use the test. Over time, this will result in significant water quality improvements on top of significant savings for the farmer.
- To complement the practices above the District offers **soil and manure test kits** to all farmers in the County. These tests are the first step in developing a nutrient management plan, and can open the District's door to those farmers that do not have plans. The value of the information garnered from the test far exceeds the minimal costs involved, and can go a long way to improving water quality.
- One of the most important components to each and every one of the above-mentioned BMPs is a **nutrient management plan**. A nutrient management plan involves much more than simply calculating nutrient application rates. It is among the first steps in identifying how an operation works and in determining if any environmental concerns exist. If an operation has nutrient runoff, erosion, or manure storage problems, they are listed in the nutrient management plan.

Our goal is to work with plan writers so that the producer can easily understand and use the plan in the field. The District will continue to write nutrient management plans for new operations participating in the Bay program, as well as continue to review the active plans that are still under contract. In addition, the District will actively promote and write NMPs for **volunteer operations** (farms not currently regulated under Act 38). This is particularly important in light of the President's Executive Order concerning the Chesapeake Bay. It is the staff's opinion that more and more farms will be required to develop and implement nutrient management plans in the coming years.

It is also worth mentioning that although the District not involved in the administration of DEP's **bio-solids** program, bio-solids are still being used by producers in the County. Due to presence of a huge fruit growing and processing industry in the County, along with the presence of Utz Potato Chips, there are a growing number of farmers that have residual food waste applied to their fields. The District lacks the authority to deal effectively with the application of these nutrient-laden materials. The District is working to educate farmers about the application of food wastes and is attempting to coordinate with DEP when situations arise.

## **REAP**

The District views the REAP program as an additional opportunity to help reduce nutrient and sediment pollution in the waters of Adams County. Several farmers that the District has had little or no previous experience working with have come to us for assistance with their REAP applications. This has given us an opportunity to talk with these farmers about no-till, cover crops and other BMPs. The District has assisted 55 applicants from the County in the past three REAP cycles. We will continue to assist farmers free-of-charge as long as the REAP program exists.

## **Urban/Suburban Water Quality**

The population of Adams County has grown from 78,247 in 1990 to 96,456 in 2003 and is expected to be 114,000 by 2010 (U.S. Census). According to the 2000 Census data, Adams County has the fastest growth rate of any county in PA Chesapeake Bay watershed. In 2003 alone, 2,472 new residential lots were proposed on 3,924 acres. In 2004, the Adams County Conservation District (District) erosion and sedimentation control staff recorded 3,974 acres of planned or developing property. From 1995 to 2003, roughly 20,000 acres of farmland had been proposed for sale or development (see map 1). From 1959 to 1999, farmland in Adams County has decreased 14% and as development increases the percentage of farmland will continue to decrease. The cost of an acre of land ranges from \$5,000 to \$30,000 in Adams County. This makes it very difficult to combat development and sprawl.

In order to fight the loss of farmland, the Adams County Agricultural Land Preservation Program has preserved 95 farms, covering nearly 14,000 acres. The County has also been able to protect an additional 2,783 acres of farmland, historic land and open space on 54 properties through the Land Conservancy of Adams County (Adams County Ag Land Preservation Office). In order to ensure that the remaining farmland we do have is not lost for good, it is imperative that the Ag land preservation program continue to receive adequate funding and support

Water quality problems are not always a result of agricultural practices. With the increase in urban/suburban areas and the loss of farm land, the balance of environmental problems is shifting to the urban side. Increased development means an increase in storm water runoff from construction sites and finished developments. New developments mean an increase in water use, septic systems, impervious surfaces and lawn fertilizer in runoff.

The District serves the citizens of Adams County by working with non-farm landowners to conserve and protect the water quality in the County through various projects and educational workshops.

- Rain-Barrel Project – Through funding from PACD, the District provides landowners with rain barrels free-of-charge. The District will continue to pursue funding sources for this project. This helps the District achieve its goal of keeping pollution out of the waters of the County by reducing runoff from major storm events and recharging ground water levels. This also helps to keep stream flows at a healthy level.

- Suburban Riparian Buffers – As on farmland, the District firmly believes that riparian stream buffers can drastically reduce runoff and pollution from yards and parking lots.
- Stream Monitoring – The District can use this data to focus our efforts in areas that need it most.
- Well and Septic System Workshops – The District educates homeowners on the importance of maintaining properly functioning septic systems. We believe that this will result in less nutrient pollution reaching the stream.
- Well Water testing services
- Stream cleanups

### **Storm Water Management**

Half of Adams County has a storm water management plan of its own in place. The other half of the County operates under a joint project between Adams and York Counties. Adams County was the first county in the State to create storm water management plans that address both water quantity and quality. The plans address specific issues such as groundwater recharge, water quality, flooding, and channel protection. An official standard was established for each of these criteria. These standards must be followed for all new land development activities. The County is currently working with townships and municipalities to enact storm water ordinances.

### **Wood Lot Management**

Educating landowners about how to prevent non-point source pollution from their woodlots is becoming more important as large woodlots are divided into smaller parcels. It is important to emphasize to these landowners that tree roots are soil stabilizers. Also, the undisturbed layer of leaves that fall to the ground protects the soil and prevents soil erosion. The undisturbed foliage slows runoff and allows more water to be absorbed into the soil, rather than running directly to the stream. In order to better educate landowners, the District has held wood lot workshops that covered topics such as: long-term management planning of woodlots, identifying and managing defects in trees, tree identification, and protecting clean water.

### **Summary**

The District believes that the greatest nitrogen, phosphorus, and sediment reductions can be achieved in Adams County by responsibly handling, applying, and transporting excess manure, in conjunction with increased no-till farming and cover cropping. If funding was not an issue, no-till farming, grass buffer strips, cover crops, and nutrient management plan implementation would be our top priorities. Implementation of these practices will have immediate beneficial impacts on water quality in both Adams County and, accordingly, the Chesapeake Bay. The appendix lists Adams County Chesapeake Bay tributary strategy goals through 2010. The goals list what we will try to achieve on a yearly basis. In the near term, the strategy will focus heavily on gathering current data and identifying trends within the County in order to better focus our efforts.

As government agriculture regulations become ever stricter, and the need for greater conservation measures becoming more and more urgent, it is important that farmers have both the technical and financial support of County Conservation Districts. Not one part of our proposed tributary strategy can be accomplished without **adequate funding**. The financial needs of both staffing and BMP installation must be met to reach the goal of a cleaner Bay. Despite diminished funding, we are continuing to look at emerging technologies and innovative conservation practices.

The Adams County Conservation District has been protecting the Chesapeake Bay for decades and through the Chesapeake Bay Program since 1985. Through whole farm approaches, the District has helped to install numerous BMP systems and a vast number of BMPs that have resulted in a cleaner, healthier environment, while earning the hard-won trust of the farming community. Although the focus of the Bay program is changing, it is important to continue the installation of traditional BMPs in addition to the newer agronomic focused BMPs that we have mentioned in our strategy. Since both of the County's watersheds drain into the Chesapeake Bay, Adams County plays a vital role in achieving a clean Chesapeake Bay. In addition, The President's Executive Order concerning the Chesapeake Bay has added even more urgency to our efforts. The lofty goals that have been set can only be reached if all agencies involved work together. The District is ready to take on its role to help clean the Bay.

# Appendix

Below is a list of practices from the Adams county Chesapeake Bay Tributary Strategy that fall under the BMPs in section 5a of the detailed budget worksheet.

## **BMPs (Nutrient Management, Precision Agriculture)**

4 scales to calibrate manure spreaders @ \$1,500 each = \$6,000

1 Chlorophyll meter @ \$2,000

PSNT testing: Staff hours

Manure testing: 2 per farmer x 20 farms x \$35 each = \$1,400

Soil testing: 20 per farmer x 20 farms x \$9 each = \$4,000

## **BMPs (Nutrient Management, Animal Waste Management System)**

Covered Satellite manure storages: \$25,000 each x 20 farms = \$500,000

## **BMPs (Nutrient Management, Ammonia Emissions Reductions)**

Windmill aeration systems: \$800 each x 40 farms = \$32,000

Manure pit additives: A 10 pound pail of microbes will treat 50,000 gallons and cost \$90

\$1000 of microbes x 40 farms = \$40,000

## **BMPs (Nutrient Management, Conservation Tillage, Cover Crops, No-Till, Carbon Sequestration)**

Promoting no till farming: Staff hours

Tile drainage: \$1.25/ft x 90,000ft = \$112,000 @ 50% cost share \$56,250 ≈ 300 acres of no-till for 5 years. \$37.40/year

Retrofitting planter equipment: \$600 per unit x 10 farmers x 2 units per farmer = \$12,000

Promoting the aerway aeration program and other equipment: Staff hours

Cover crops: Wheat \$7/bushel, Grain rye \$9/bushel, Annual rye grass \$34 for a 50lb bag

Demo new varieties: \$5,000 ≈ 250 acres

Rolling stalk chopper: \$3,000

## **BMPs (Nutrient Management, Grass Buffers, Non-Urban Stream Restoration)**

Grass Buffers: 15 miles of 35ft buffers \$16,000

## **BMPs (Nutrient Management, Animal Waste Management Systems, Ammonia Emission Reduction)**

Working with a manure hauler to buy a 20ft Aerway for no-till and manure injection: \$25,000

**BMPs (Nutrient Management, No-Till, Off Stream Watering With and Without Fencing, Rotational grazing)**

Continue to encourage the conversion of cropland into permanent grass: Staff hours, funding for fence, waterier, and crossing would vary per farm. Project Grass \$15,000 for 5 years = \$75,000  $\approx$  2,500 acres

**BMPs (Nutrient Management, No-Till)**

Establish a long term continuous no-till plot. Staff hours  
Perform tillage, compaction, and % organic matter surveys: Staff hours  
2 penetrometers for compaction survey @ \$220 each.

**BMPs (Nutrient Management, Animal Waste Management System)**

Installation of underground pipes for irrigation: Demo 4 farms x 10,000ft per farm x 3/ft of 3in pipe = \$120,000  $\approx$  1000 acres  
Transportable manure separator: \$35,000  
Tanker with irrigation gun: \$40,000

**BMPs (Nutrient Management)**

Nutrient management planning: Although the cost to write a plan can be a low as \$7/acre, the cost to implement a plan can run into the tens of thousands of dollars.

**BMPs (Conservation Plans)**

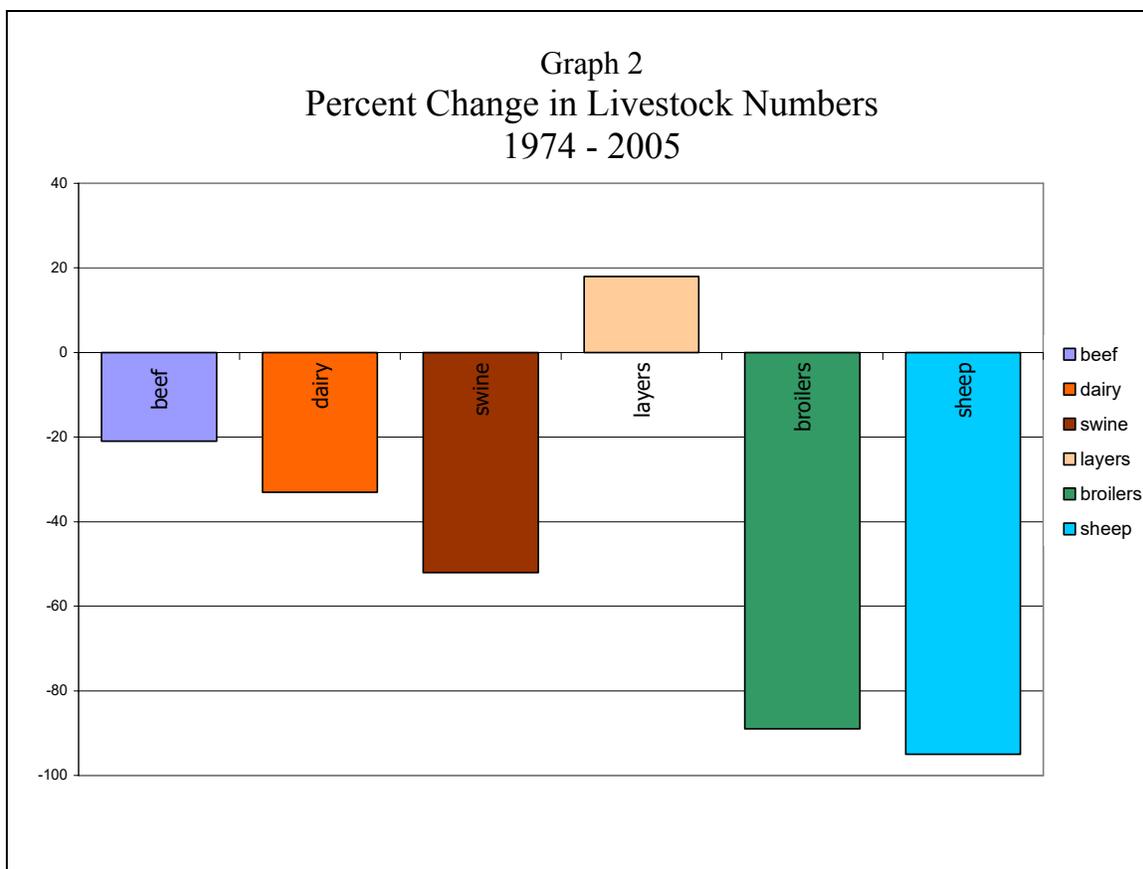
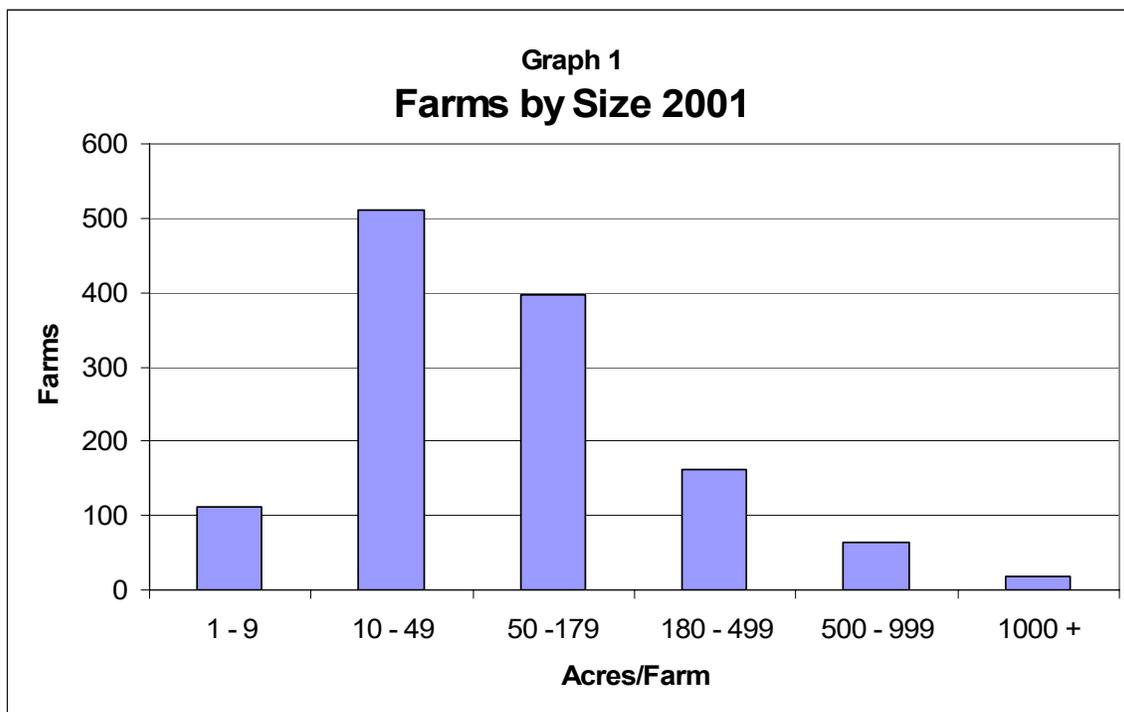
Over 250 tracts that need conservation plans: Staff hours  
Implementation: \$15,000 for 5 years = \$100,000  $\approx$  500 acres

**BMPs (Urban Sprawl Reduction)**

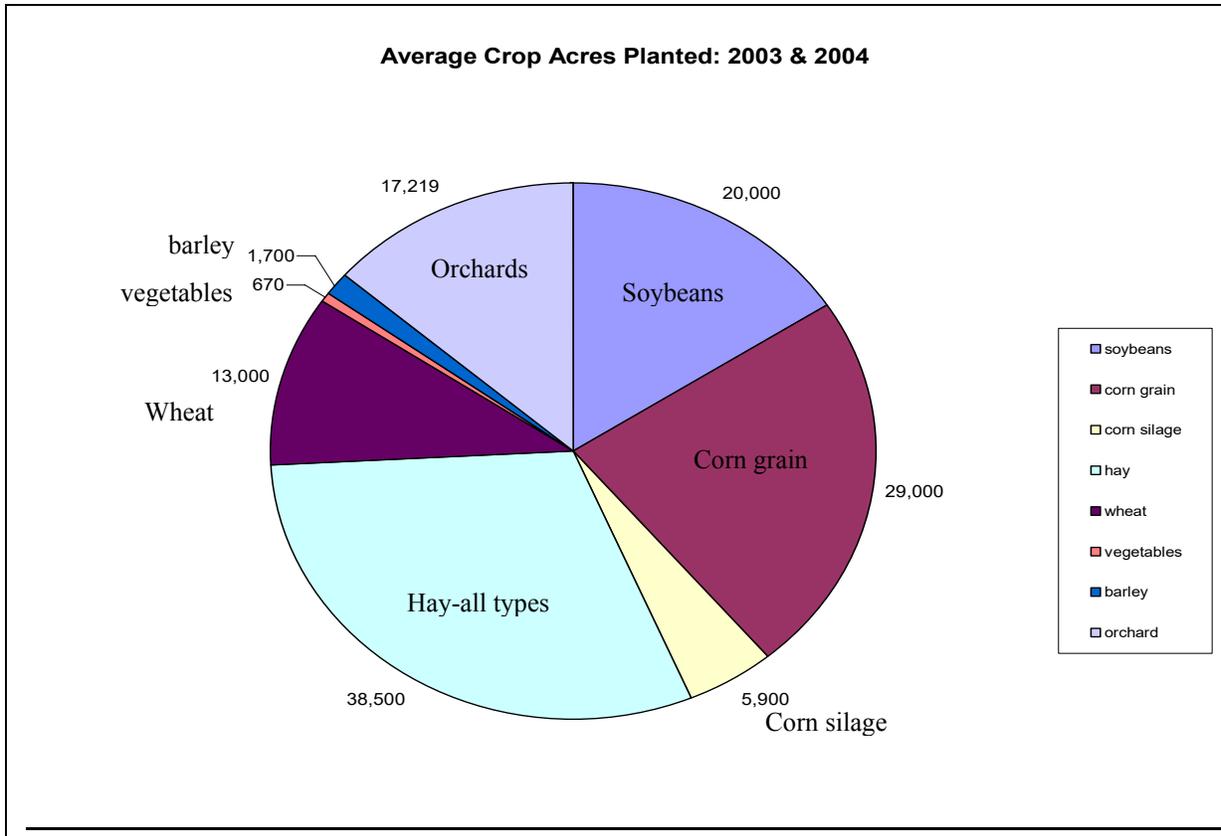
Farmland Preservation: 2004 funding of \$400,000 allowed for 250 acres to be preserved, 3 staff

**BMPs (Erosion & Sedimentation Controls, Storm water Management: Filtration, Infiltration Practices, And Wet Ponds & Wetlands)**

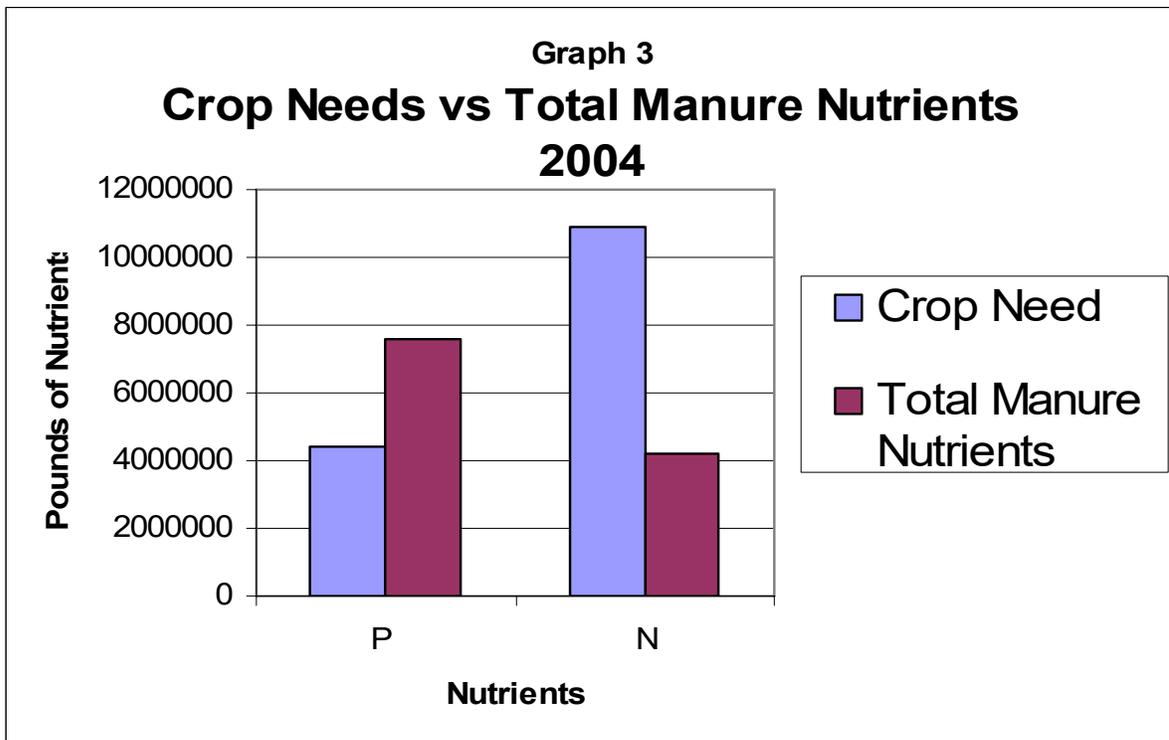
Continue E&S staff field presence, inspections and enforcement actions: Staff hours  
Continue to implement the Adams County storm water management plan: Staff hours

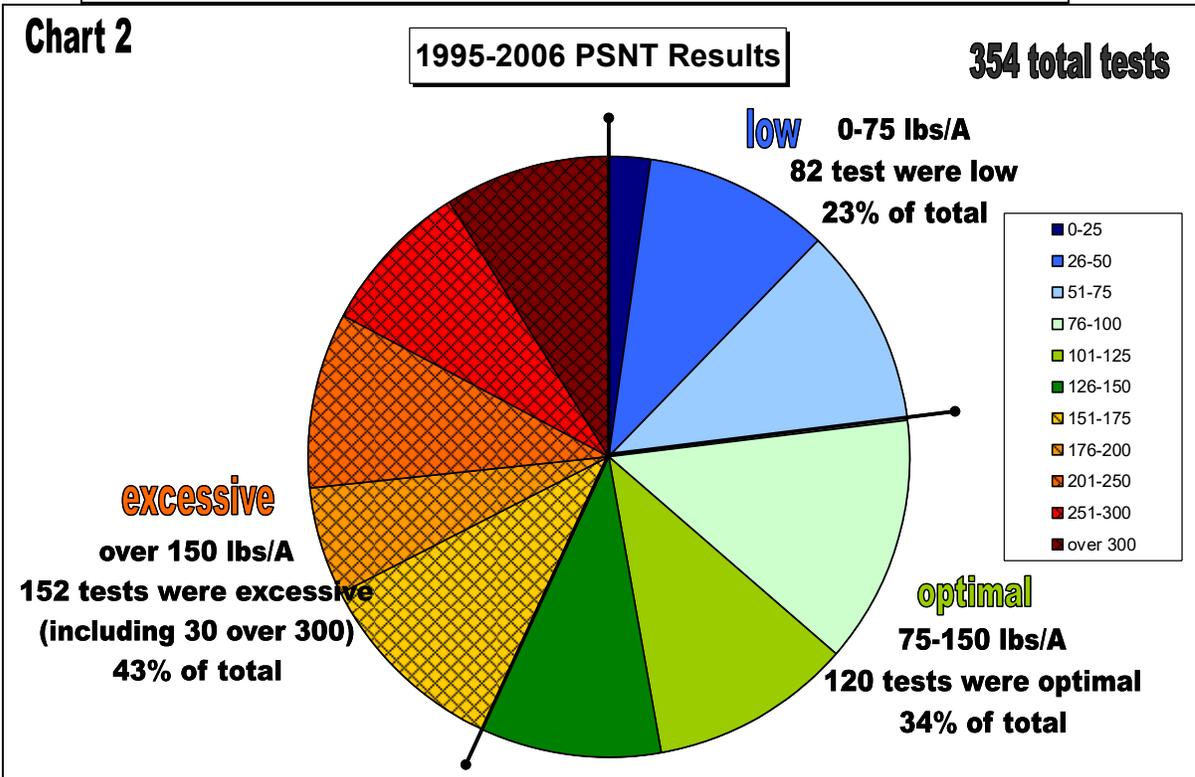
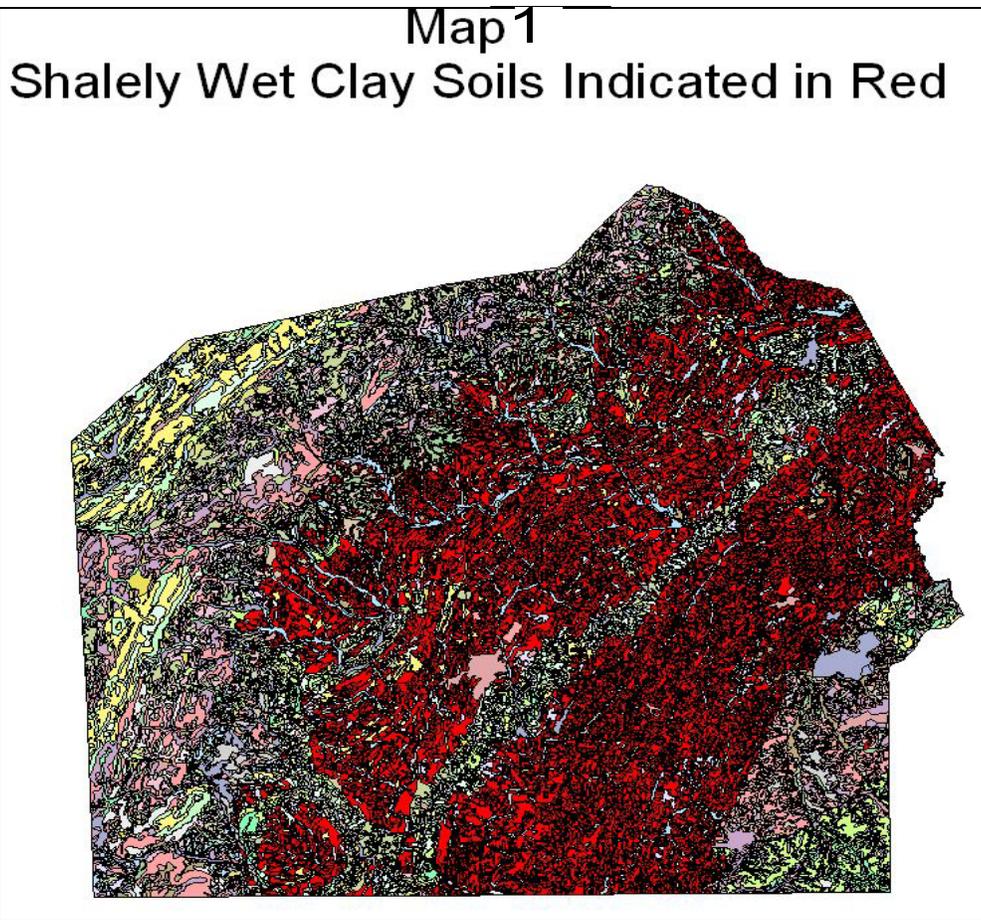


**Chart 1**



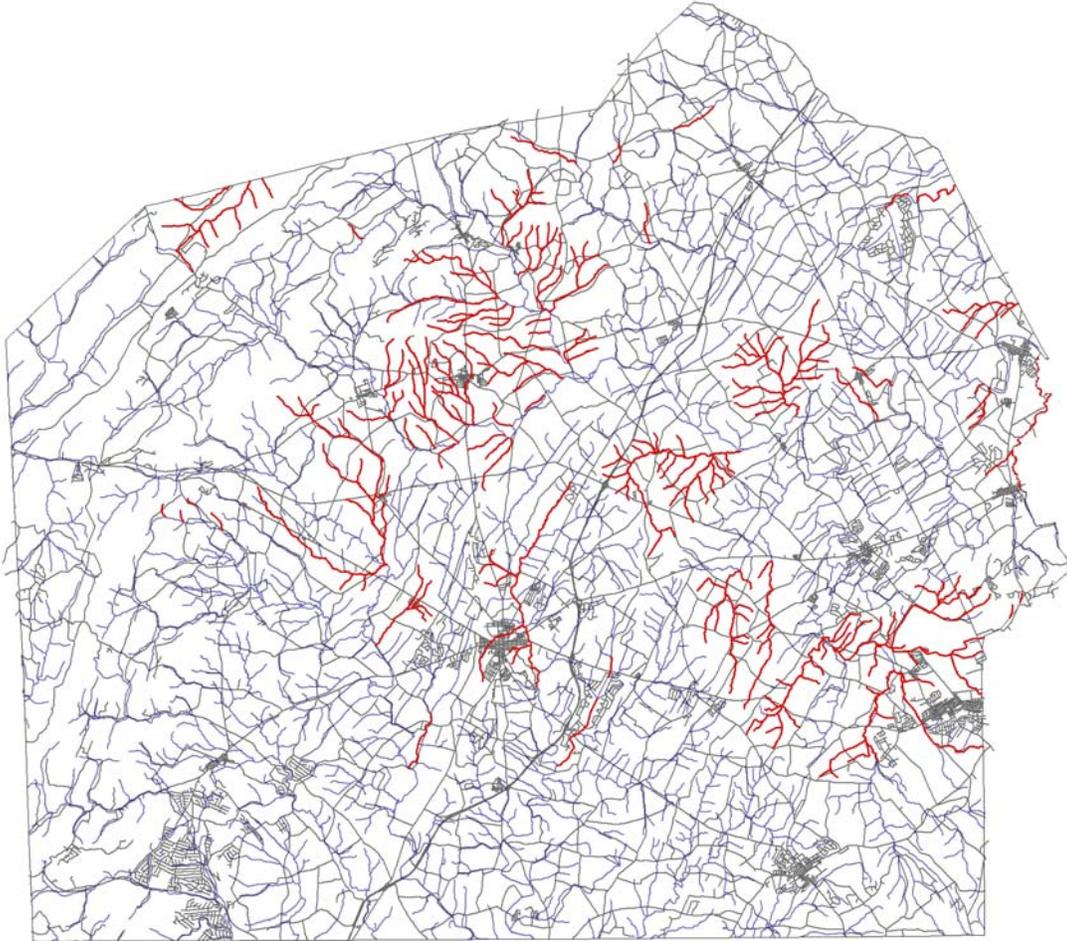
**Graph 3**  
**Crop Needs vs Total Manure Nutrients**  
**2004**





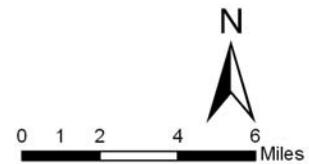
# Impaired Streams - Adams County

## PA DEP 303d list



### Legend

- DEP 2006 303d Impaired Streams
- streams
- roads



**Category 5- Impaired Waters in Adams County Requiring TMDLs  
from 2006 Pennsylvania Integrated Water Quality Monitoring and Assessment Report**

**Streams**

**Hydrologic Unit Code: 02050305-Lower Susquehanna-Swatara**

<b>Assessment Unit - Source Date</b>	<b>Cause</b>	<b>Evaluated Use-</b>	<b>Miles</b>	<b>Date Listed</b>	<b>TMDL</b>
<b>"Dead Woman Hollow"</b>					
New ID:8290 Atmospheric Deposition	Old ID:970609-1330-KPE pH	Use:Aquatic Life	Miles=3.45	1998	2011
<b>"Dead Woman Hollow" (Unt 63192)</b>					
New ID:8290 Atmospheric Deposition	Old ID:970609-1330-KPE pH	Use:Aquatic Life	Miles=0.46	1998	2011
<b>Mountain Creek</b>					
New ID:8290 Atmospheric Deposition	Old ID:970609-1330-KPE pH	Use:Aquatic Life	Miles=5.61	1998	2011
<b>Mountain Creek (Unt 63189)</b>					
New ID:8290 Atmospheric Deposition	Old ID:970609-1330-KPE pH	Use:Aquatic Life	Miles=0.94	1998	2011
<b>Mountain Creek (Unt 63194)</b>					
New ID:8290 Atmospheric Deposition	Old ID:970609-1330-KPE pH	Use:Aquatic Life	Miles=0.58	1998	2011
<b>Mountain Creek (Unt 63195)</b>					
New ID:8290 Atmospheric Deposition	Old ID:970609-1330-KPE pH	Use:Aquatic Life	Miles=0.59	1998	2011
<b>Mountain Creek (Unt 63196)</b>					
New ID:8290 Atmospheric Deposition	Old ID:970609-1330-KPE pH	Use:Aquatic Life	Miles=0.43	1998	2011
<b>Mountain Creek (Unt 63197)</b>					
New ID:8290 Atmospheric Deposition	Old ID:970609-1330-KPE pH	Use:Aquatic Life	Miles=1.04	1998	2011
<b>Mountain Creek (Unt 63198)</b>					
New ID:8290 Atmospheric Deposition	Old ID:970609-1330-KPE pH	Use:Aquatic Life	Miles=0.53	1998	2011

**Hydrologic Unit Code: 02050306-Lower Susquehanna**

<b>Plum Creek</b>					
New ID:4987 Agriculture Urban Runoff/Storm Sewers	Old ID:20030602-1230-MSE Siltation	Use:Aquatic Life	Miles=4.41	2004 2004	2017 2017
<b>Plum Creek (Unt 08882)</b>					
New ID:4987 Urban Runoff/Storm Sewers Agriculture	Old ID:20030602-1230-MSE Siltation	Use:Aquatic Life	Miles=1.11	2004 2004	2017 2017
<b>Plum Creek (Unt 08886)</b>					
New ID:4987 Urban Runoff/Storm Sewers Agriculture	Old ID:20030602-1230-MSE Siltation	Use:Aquatic Life	Miles=0.84	2004 2004	2017 2017

**Hydrologic Unit Code: 02070009-Monocacy**

<b>Little Marsh Creek (Unt 58977)</b>						
New ID:10549	Old ID:990603-1400-JDC	Use:Aquatic Life	Miles=0.37			
Small Residential Runoff	Nutrients			2002		2015
	Siltation			2002		2015
Urban Runoff/Storm Sewers	Nutrients			2002		2015
	Siltation			2002		2015
Industrial Point Source	Unknown Toxicity			2002		2015
<b>Little Marsh Creek (Unt 58981)</b>						
New ID:10549	Old ID:990603-1400-JDC	Use:Aquatic Life	Miles=0.57			
Industrial Point Source	Unknown Toxicity			2002		2015
Urban Runoff/Storm Sewers	Siltation			2002		2015
	Nutrients			2002		2015
Small Residential Runoff				2002		2015
	Siltation			2002		2015
<b>Little Marsh Creek (Unt 63639)</b>						
New ID:10549	Old ID:990603-1400-JDC	Use:Aquatic Life	Miles=0.28			
Industrial Point Source	Unknown Toxicity			2002		2015
Small Residential Runoff	Nutrients			2002		2015
	Siltation			2002		2015
Urban Runoff/Storm Sewers	Nutrients			2002		2015
	Siltation			2002		2015
<b>Little Marsh Creek (Unt 63641)</b>						
New ID:10549	Old ID:990603-1400-JDC	Use:Aquatic Life	Miles=0.31			
Industrial Point Source	Unknown Toxicity			2002		2015
Small Residential Runoff	Nutrients			2002		2015
	Siltation			2002		2015
Urban Runoff/Storm Sewers	Nutrients			2002		2015
	Siltation			2002		2015
<b>Mummasburg Run</b>						
New ID:8956	Old ID:980528-1300-BJG	Use:Aquatic Life	Miles=2.27			
Agriculture	Nutrients			2002		2015
	Siltation			2002		2015
New ID:8978	Old ID:980605-1000-BJG	Use:Aquatic Life	Miles=2.24			
Crop Related Agric	Nutrients			2002		2015
	Unknown Toxicity			2002		2015
New ID:8979	Old ID:980605-1210-BJG	Use:Aquatic Life	Miles=1.93			
Agriculture	Nutrients			2002		2015
<b>Mummasburg Run (Unt 59001)</b>						
New ID:8956	Old ID:980528-1300-BJG	Use:Aquatic Life	Miles=0.95			
Agriculture	Nutrients			2002		2015
	Siltation			2002		2015
<b>Mummasburg Run (Unt 59002)</b>						
New ID:8956	Old ID:980528-1300-BJG	Use:Aquatic Life	Miles=1.02			
Agriculture	Nutrients			2002		2015
	Siltation			2002		2015
<b>Mummasburg Run (Unt 59003)</b>						
New ID:8956	Old ID:980528-1300-BJG	Use:Aquatic Life	Miles=0.76			
Agriculture	Nutrients			2002		2015
	Siltation			2002		2015
<b>Mummasburg Run (Unt 59004)</b>						
New ID:8956	Old ID:980528-1300-BJG	Use:Aquatic Life	Miles=2.33			
Agriculture	Nutrients			2002		2015
	Siltation			2002		2015
<b>Mummasburg Run (Unt 59005)</b>						
New ID:8956	Old ID:980528-1300-BJG	Use:Aquatic Life	Miles=0.61			
Agriculture	Nutrients			2002		2015
	Siltation			2002		2015
<b>Mummasburg Run (Unt 59006)</b>						
New ID:8978	Old ID:980605-1000-BJG	Use:Aquatic Life	Miles=0.6			

Crop Related Agric	Nutrients			2002	2015
	Unknown Toxicity			2002	2015
<b>Mummasburg Run (Unt 59007)</b>					
New ID:8979	Old ID:980605-1210-BJG	Use:Aquatic Life	Miles=0.42		
Agriculture	Nutrients			2002	2015
<b>Mummasburg Run (Unt 59008)</b>					
New ID:8979	Old ID:980605-1210-BJG	Use:Aquatic Life	Miles=1.14		
Agriculture	Nutrients			2002	2015
<b>Plum Run</b>					
New ID:10153	Old ID:990331-0930-JDC	Use:Aquatic Life	Miles=1.72		
Small Residential Runoff	Nutrients			2002	2015
<b>Rock Creek</b>					
New ID:10546	Old ID:990603-1300-JDC	Use:Aquatic Life	Miles=1.55		
Small Residential Runoff	Siltation			2002	2015
Urban Runoff/Storm Sewers	Nutrients			2002	2015
Small Residential Runoff				2002	2015
Grazing Related Agric	Siltation			2002	2015
	Nutrients			2002	2015
Urban Runoff/Storm Sewers	Siltation			2002	2015
New ID:10556	Old ID:990604-1100-JDC	Use:Aquatic Life	Miles=3.42		
Grazing Related Agric	Nutrients			2002	2015
	Siltation			2002	2015
	Thermal Modifications			2002	2015
New ID:11208	Old ID:990910-1030-JDC	Use:Aquatic Life	Miles=1.83		
Small Residential Runoff	Nutrients			2002	2015
Urban Runoff/Storm Sewers	Siltation			2002	2015
Small Residential Runoff				2002	2015
Grazing Related Agric	Nutrients			2002	2015
Urban Runoff/Storm Sewers				2002	2015
Grazing Related Agric	Siltation			2002	2015
<b>Rock Creek (Unt 59151)</b>					
New ID:10539	Old ID:990603-0930-JDC	Use:Aquatic Life	Miles=0.64		
Grazing Related Agric	Siltation			2002	2015
Small Residential Runoff	Nutrients			2002	2015
	Siltation			2002	2015
Urban Runoff/Storm Sewers	Nutrients			2002	2015
	Siltation			2002	2015
<b>Rock Creek (Unt 59152)</b>					
New ID:10539	Old ID:990603-0930-JDC	Use:Aquatic Life	Miles=0.43		
Grazing Related Agric	Siltation			2002	2015
Small Residential Runoff	Nutrients			2002	2015
	Siltation			2002	2015
Urban Runoff/Storm Sewers	Nutrients			2002	2015
	Siltation			2002	2015
<b>Rock Creek (Unt 59153)</b>					
New ID:10539	Old ID:990603-0930-JDC	Use:Aquatic Life	Miles=0.64		
Small Residential Runoff	Nutrients			2002	2015
Urban Runoff/Storm Sewers	Siltation			2002	2015
Small Residential Runoff				2002	2015
Grazing Related Agric				2002	2015
Urban Runoff/Storm Sewers	Nutrients			2002	2015
<b>Rock Creek (Unt 59165)</b>					
New ID:10554	Old ID:990604-1000-JDC	Use:Aquatic Life	Miles=1.17		
Grazing Related Agric	Siltation			2002	2015
<b>Rock Creek (Unt 59166)</b>					
New ID:10554	Old ID:990604-1000-JDC	Use:Aquatic Life	Miles=0.87		
Grazing Related Agric	Siltation			2002	2015

<b>Rock Creek (Unt 59167)</b>						
New ID:10554	Old ID:990604-1000-JDC	Use:Aquatic Life	Miles=0.54			
Grazing Related Agric	Siltation			2002		2015
<b>Rock Creek (Unt 59222)</b>						
New ID:10556	Old ID:990604-1100-JDC	Use:Aquatic Life	Miles=2.05			
Grazing Related Agric	Nutrients			2002		2015
	Siltation			2002		2015
	Thermal Modifications			2002		2015
<b>Stevens Run</b>						
New ID:10549	Old ID:990603-1400-JDC	Use:Aquatic Life	Miles=2.26			
Industrial Point Source	Unknown Toxicity			2002		2015
Small Residential Runoff	Nutrients			2002		2015
	Siltation			2002		2015
Urban Runoff/Storm Sewers	Nutrients			2002		2015
	Siltation			2002		2015
<b>White Run</b>						
New ID:10141	Old ID:990329-1300-JDC	Use:Aquatic Life	Miles=1.23			
Small Residential Runoff	Nutrients			2002		2015
	Siltation			2002		2015
<b>Willoughby Run</b>						
New ID:8535	Old ID:970917-1245-JDC	Use:Aquatic Life	Miles=1.74			
Agriculture	Organic Enrichment/Low D.O.			1998		2011
	Siltation			1998		2011

## Lakes

Lake Name - Use Assessed Source/Cause -	Assessment Unit ID,	Reach Code,	Acres
		Date Listed	
<b>02050306-Lower Susquehanna</b>			
Lake Meade :02050306 Aquatic Life	ID: 3469	Reach Code=02050306002278	Acres= 273 HUC
Agriculture/Suspended Solids -		2006	
Small Residential Runoff/Nutrients -		2006	
Small Residential Runoff/Suspended Solids -		2006	
Agriculture/Nutrients -		2006	
<b>02070004-Conococheague</b>			
Long Pine Run Reservoir :02070004 Aquatic Life	ID: 3148	Reach Code=02070004002287	Acres= 151 HUC
Atmospheric Deposition/pH -		2002	

## Adams County Chesapeake Bay Tributary Strategy Goals

Practice	Units	Yearly County Goals							
		2010 Goals	Completed as of 2002	2005	2006	2007	2008	2009	2010
Abandoned Mined Land Reclamation	Acres	20	38						
Animal Waste Management Systems	AEUs	10,184	7,942	200	200	200	200	200	200
Carbon Sequestration	Acres	10,724	0	1,000	2,000	3,000	4,000	5,000	7,500
Conservation (Farm) Plans	Acres	112,611	33,167	4,500	4,500	4,500	4,500	4,500	4,500
Conservation Tillage	Acres	39,936	35,167						

Cover Crops (early)	Acres	34,741	0	100	100	250	600	900	1500
Dirt & Gravel Road Practices	Feet	52,222	4,500	4,000	4,000	4,000	4,000	4,000	4,000
Erosion & Sediment Controls	Acres	387	383	400	400	400	400	400	400
Forest Buffers	Acres	4,363	99	150	50	20	20	20	20
Forest Harvesting Practices	Acres	0	0						
Grass Buffers	Acres	2,254	6	20	20	20	20	20	20
Horse Pasture Management	Acres	15,108	0	20	20	20	20	20	20
Land Retirement	Acres	10,058	894						
Managed Precision Agriculture	Acres	60,606	0	2,000	4,000	5,000	5,000	5,000	5,000
Mortality Composters	AEUs	2	0						
Non-Urban Stream Restoration	Feet	13,084	0						
No-Till	Acres	19,079	0	1,000	2,000	3,000	4,000	5,000	7,500
Nutrient Management	Acres	20,530	12,683	2,500	2,500	2,500	2,500	2,500	2,500
Off Stream Watering w/Fencing	Acres	5,788	614						
Off Stream Watering w/o Fencing	Acres	3,473	339						
Precision Rotational Grazing	Acres	1,389	0	200	200	200	200	200	200
Rotational grazing	Acres	926	458						
Septic Denitrification (family units)	Units	6,716	213						
Street Sweeping	Acres	565	16,000	10,000	10,000	10,000	10,000	10,000	10,000
SWM - Filtration	Acres	5,119	0	450	450	450	450	450	450
SWM - Infiltration practices	Acres	5,119	0	450	450	450	450	450	450
SWM - Wet Pond & Wetland	Acres	5,119	0	450	450	450	450	450	450
Tree Planting	Acres	468	475						
Urban Growth Reduction	Acres	246	0						
Urban Nutrient Management	Acres	10,009	0						
Urban Stream Restoration	Feet	0	0						
Wetland Restoration	Acres	195	18	1	1	2	2	4	5
Yield Reserve	Acres	20,528	0						
Dairy - Precision Feeding	AEUs	6,851	0						
Dairy - Ammonia Emission Controls	AEUs	2,284	0						
Swine - Phytase Feed Additive	AEUs	671	0						
Swine - Ammonia Emission Controls	AEUs	342	0						
Poultry - Phytase Feed Additive	AEUs	8,826	0						
Poultry - Ammonia Emissions Controls	AEUs	7,502	0						