MIFFLIN COUNTY CONSERVATION DISTRICT
2006 CHESAPEAKE BAY IMPLEMENTATION PLAN

County Description

Mifflin County is located in Central Pennsylvania, wholly within the Chesapeake Bay Watershed, and encompasses an area of 431.1 square miles. The county also falls entirely within the Ridge & Valley geophysical province and is characterized by southwest to northeast-aligned sandstone and shale ridges separated by broad, fertile limestone valleys. Elevations range from about 460 feet along the Juniata River to 2,330 feet at the summit of Stone Mountain. The major streams draining the county and their Hydrologic Unit Codes (HUC) are the Juniata River (HUC 2050304050) , Kishacoquillas Creek (HUC 2050304070), Honey Creek (HUC 2050304060, a subbasin of the Kish) and Jacks Creek (HUC 2050304080), with the Kish and Jacks creeks both flowing into the Juniata near Lewistown. Numerous smaller tributaries flow into these three major streams (note: a small portion of northeast Mifflin County lies within the Penns Creek Watershed, HUC 2050301040, and another small area of the East Licking Creek Watershed, HUC 2050304090, occurs in the southeast, but because these areas are small and almost entirely state forest land, they are insignificant to this County Implementation Plan). These geophysical features have greatly influenced how Mifflin County has been developed, the location of transportation corridors, and also the extent and types of agricultural activities found here.

The soils of Mifflin County can be grouped into seven "soil associations": the Hazelton-Laidig-Buchanan (46% of total land area), Berks-Weikert (22%), Hagerstown-Opequon-Murrill (10%), Edom-Klinesville-Weikert (7%), Mertz-Elliber-Kreamer (7%), Atkins-Monongahela-Allegheny (5%), and Morrison associations (3%).

Most of the Kishacoquillas Valley (where a majority of the county's agricultural production occurs), and to a lesser extent some portions of Ferguson Valley and the Juniata River Valley, exhibit characteristics of karst topography because of the underlying soluble limestone and dolomitic bedrock. While these areas contain some of the county's most fertile soils, they also have great potential for ground water pollution because of numerous sinkholes, caverns, solution channels and springs that can provide a direct conduit to the subsurface water table.

Mifflin County's total population has changed very little over the last 25 years, according to the U.S. Census Bureau. In 1980 the population stood at 46,908, in 1990 it was 46,197, and by 2000 it was 46,486. While the overall numbers have decreased in the last 20 years, Mifflin County is seeing a "shift" of its population from the more urbanized towns and boroughs to the more rural townships. According to census information, all towns and boroughs in the county have seen a loss of residents from 1980 to 2000 (example: Lewistown borough 1980 population, 9,830; 2000 population, 8,998), while some of the rural townships have seen a significant population increase (example: Brown Township 1980 population, 3,003; 2000 population, 3,852). This has resulted in the development of a number of "suburban" communities, and not surprisingly the conversion of some of the county's most productive farmland to residential areas. A farmland loss analysis performed by the County GIS Department reported that Mifflin County lost 3,248 acres of farmland to development from 1975 to 1995.

According to the USDA National Agricultural Statistics Service 2002 Census of Agriculture, Mifflin County has 752 farms encompassing 90,486 acres. Of this land, 61,087 acres are in cropland. The market value from the sale of agricultural products in 2002 totaled $ 55,488,000, making agriculture second only to manufacturing in gross receipts for Mifflin County's economy. The county's 752 farms average 120 acres in size. Dairy farming continued to be the predominant type of farming in 2002, with 13,584 dairy cows on 314 farms. There were 2,563 beef cows on 192 farms, and a total cow and calf inventory of 32,287 animals on 533 farms. Mifflin County's hog and pig inventory stood at 22,528 animals on 90 farms, with 85,174 hogs sold in 2002. In addition, there were 1,416,212 broilers and other meat chickens produced and sold from 17 poultry farms.

Mifflin County is home to a community of 2000+ Amish, particularly in the Kishacoquillas Valley. Not surprisingly, the Amish also make up a significant portion of the county's agricultural community. They have also traditionally not participated in many government financial and technical assistance programs, including those promoting soil and water conservation.

Water Resources/ Quality

Streams and Watersheds

Mifflin County includes 684 miles of streams, all within the Chesapeake Bay Watershed. The Department of Environmental Protection (DEP) conducted an assessment of 640 miles of stream in Mifflin County and found 538 miles to be attaining the water quality standards set forth in the Commonwealth of Pennsylvania, Pennsylvania Code, Title 25, Environmental Protection, Chapter 93, Water Quality Standards (Water Quality Standards) and 102.4 miles to be impaired. The majority of the impairment identified was due to agriculture, but other sources of impairment included stormwater runoff/ storm sewers, atmospheric deposition, silvaculture and hydromodification.

Mifflin County can be divided into three main watersheds, Kishacoquillas Creek watershed, Jacks Creek Watershed, and the Juniata Watershed. The Kishacoquillas Creek watershed drains the most number of acres in the county, 122,240 acres (191 square miles), or 44.3% of the county. This watershed also has the most areas of impairment with 95.9 miles of the 102.4 impaired miles of stream. Of those 95.9 miles, 86.4 miles are due to agricultural operations, 7.3 miles are due to atmospheric deposition and 2.2 miles are due to hydromodification (See Table 1. DEP 303 (d) Impaired Stream Segments). Jack's Creek drains the fewest number of acres, but 8.6 miles are impaired due to an unknown source of PCBs, which is a human health issue. This has resulted in a fish consumption advisory. This stream also has 1.6 miles of impaired stream due to agriculture. The Juniata Watershed includes 4.9 miles of impaired streams.

In June 2003 the Mifflin County Conservation District (The Conservation District) completed a detailed watershed assessment of the majority (171 square miles) of the Kish Creek watershed. Of the two sub-sheds , Buck Run and Hungry Run, that were not part of this detailed assessment,

Hungry Run was determined to be impaired by the DEP assessment. These two watersheds were also recently assessed by the Lewistown Area High School and the Conservation District under a Growing Greener grant.

Classifications

Designation of streams within the Kishacoquillas Watershed

According to PA Code Title 25, Chapter 93 water Quality Standards, the Kish Creek basin from its source to the confluence with Tea Creek has a designated protected water use classification of CWF (Cold Water Fisheries). This part of the mainstem is locally referred to as the West Branch of Kish Creek. From its confluence with Tea Creak to the mouth, where it meets the Juniata River, Kish Creek formally has a Chapter 93 classification of TSF (Trout Stocked Fisheries).

The two major subbasins, which constitute the northeastern portion of the watershed are considered Special Protection Waters. Tea Creek, with a basin of 12.0 square miles, is classified HQ-CWF (High Quality Cold Water Fisheries); Honey Creek, with a 93.3 square mile basin, is HQ-CWF, MF (High Quality Cold Water Fisheries, Migratory Fishes). Both Tea Creek and the lower 3 miles of Honey Creek are Class A Wild Trout Waters, according to the PA Fish and Boat Commission (PA F&BC). A 2.4-mile stretch of the mainstem of Kish Creek, in the Burnham/ Yeagertown area and the entire Frog Hollow basin, is also considered Class A Wild Trout Water. PADEP has upgraded the "existing use" of these two areas to HQ-CWF. Other portions of the mainstem and the Honey Creek subbasin (including Treaster Run, Lingle, Havice, and upper Honey creeks) are stocked annually by the PA Fish & Boat Commission.

Buck Run, a tributary to Kishacoquillas Creek on the south side of Jack's Mountain, has a Chapter 93 classification of TSF (Trout Stocked Fisheries). Hungry Run, another tributary on the south side of Jack' Mountain, has a Chapter 93 classification of TSF and is also listed on the PA Fish and Boat Commissions surveyed list of naturally occurring wild trout.

Designation of streams within the Jacks Creek Watershed

Jack's Creek has a basin wide Chapter 93 classification of Cold Water Fisheries (CWF) from its source to Meadow Creek. The basin from Meadow Creek to the mouth of the Juniata is classified as TSF.

Designation of streams within the Juniata River Watershed

According to the PASDA GIS data layer, there are 12 named subwatersheds to the Juniata River watershed in Mifflin County (not including Kishacoquillas Creek and Jack's creek). Of those subwatersheds, the basin of each of the following watersheds are all classified as special protection watersheds with a Chapter 93 classification of HQ-CWF: Beaverdam Run, Wharton Run, Shanks Run, Musser Run, Town Run, Wakefield Run, Carlisle Run, Strodes Run, Minehart Run and Granville Run. Sugar Valley Run is has a Chapter 93 classification of Cold Water Fisheries (CWF). Furnace Run has a basin wide Chapter 93 classification of HQA-CWF. Any unnamed tributary to the Juniata River is also classified as HQ-CWF between the Raystown

Branch and Kishacoquillas Creek. The Juniata River itself has a Chapter 93 classification of Warm Water Fisheries (WWF)

For a more concise look at the DEP stream classifications, consult PA Code Title 25, Chapter 93 water Quality Standards.

Impairments: See Table 1.
Source: DEP's List of Impaired streams.
http://www.dep.state.pa.us/dep/deputate/watermgt/Wqp/WQStandards/303d-04_L5S.pdf pg.248-253

Sediment/Nutrient Loads: See Table 2.
*The caveats listed below accompanied this data provided to the District by DEP.
1. The nutrient and sediment loads listed do not represent actual 2002 loads. The loads are those projected to eventually occur when all the reported management practices installed between 1985 and 2002 become fully functional at reducing loads to surface water and within groundwater.
2. All loading and land use information provided by EPA's Chesapeake Bay Program Office.
3. All nutrient and sediment loads calculated using EPA's Chesapeake Bay Program watershed model.
4. The nutrient and sediment loads represent the sum of the individual loads for those model segment(s) which comprise the area with a county. That is, for counties with more than one portion of a model segment within the county boundary, the loads for each segment were added together to obtain the total for the county.

Trends of Significance to Water Quality

Agricultural Trends; types, sizes, technologies, practices, BMPs

Dairy

Dairy farming continues to be the most prevalent farming style in Mifflin County. However there were 75 fewer dairy farms in 2002 than in 1987. While the total number of dairy farms has declined, according to the 2002 Ag Census, the average herd size has increased by ten milking cows per farm. Keep in mind this is a countywide average that is strongly influenced by a significant Amish population, which usually have smaller herds of dairy cattle. According to the Mifflin County GIS Department, there are 279 Amish parcels totaling 22,446 acres. This figure represents 20% of the total agricultural acres in the Big Valley Area, which is the densest farming area of the county. The herd size of the family dairy farm in Mifflin County has still increased considerably over the last 15 years. Farms milking over 100 cows once a rarity are now more common.

Most dairy farmers are using a pipeline system but many of the larger operations have installed parlors. Within the Amish farming community most are still milking by hand, however certain churches are allowing the use of modern milking systems including bulk tanks.

Common Best Management Practices (BMPS) on dairy farms have been manure storage structures, milk house waste handling systems, barnyard runoff control systems, and roof water management. While these continue to be popular BMPs, there cost effectiveness has been questioned.

Hogs and Pigs

The swine industry in Mifflin County has followed a similar trend as the dairy industry. There are fewer farmers raising more animals. In fact, according to the most recent Ag Census there were almost 5 times as many hogs and pigs sold in 2002 as there were in 1987 from 30 less producers.

There are approximately 81 swine producers in the county with the majority of the swine being sold from six operations. Five of the six are finishing operations ranging in size from 1200 to 4000 head. One farm is a 1400 head sow, farrow to feeder operation. All of these operations are CAOs and 4 of the 6 are CAFOs. All have approved nutrient management plans. The remaining 75 operations are much smaller, seldom reaching more than 25 Animal Equivalent units. Most are farms with less than a dozen sows that sell both feeder and finishing pigs at the local livestock sales.

BMPs on the larger operations have been manure storage structures, diversions, roof water management and soil and manure testing. Typically these operations do not require many BMPs because the animals are confined 100% of the time.

Poultry

The poultry industry in the county appears to be on the decline with thirteen fewer farms in 2002 (17) as there were in 1987 (30). During the same period of time meat production went from 2.7 million birds to 1.4 million birds. The layer industry has also seen a major decline. There are 50 less farms with a 135,500 fewer birds, which represent a 96% reduction.

There is a segment of the poultry industry that the 2002 Census did not capture. Mifflin County has an increasing number of turkey operations. In 2004 over 700,000 turkeys will be grown and sold from 5 different producers. Each of these operations is a CAO and therefore has an approved nutrient management plan.

As with other confinement type operations, BMPs are usually not necessary. However, several operations have installed roofed stacking structures to temporarily store manure. Additionally, mortality composting is gaining popularity as the cost of rendering has increased dramatically over the last year.

Sheep

The sheep and lamb inventory for Mifflin County has seen no significant shift in numbers over the last 15 years, although there were 13 more producers in 2002 (92) than in 1987 (79). There seems to be an increase in the installation of BMPs on sheep farms in recent years. At least two grazing plans have been developed for area sheep farmers. Stream fencing has been completed on two farms and riparian buffers established on one.

Beef Cattle

More farms were raising beef in 2002 (192), than in 1987 (101). Additionally, the average number of animals per farm has increased from 9.5 to almost 13.5. The county does have several farms with over 100 head.

Grazing plans have been written on at least one operation. Additional BMPs used on Beef operations have been stream fencing, watering systems, and heavy use area protection.

Trends—Agricultural analysis for the Kishacoquillas Creek Watershed

The Kishacoquillas Creek Watershed includes 44.3% of the landmass in Mifflin County and includes most of the agricultural production in the county. The Kish Creek watershed has the highest percentage of agricultural stream impairment in Mifflin County. These reasons prompted the District to request and receive a Growing Greener grant to conduct an agricultural analysis for this watershed.

Out of the 112,089 acres in the portion of the Kish watershed that we studied, 32,514 acres (29%) are agricultural. Of those, only 6,935 acres (21%) have "Conservation Plans" developed by the Natural Resource Conservation Service (NRCS) establishing conservation Best Management Practices (BMPs). We do not have this type of information for the two watersheds that have not had in-depth assessments. This can be considered a "need".

The following detailed information is for the Kish watershed. Of the 176 approved NRCS BMP's identified on the NRCS website, only twenty-one (21) different BMP's are currently identified as recommended in Conservation Plans in the watershed (See Table 3 for a list of the BMP acres by practice in the watershed).

The Conservation Practice (CP) recommended for the most acreage is Conservation Crop Rotation (20% of all agricultural acres in the watershed and 95% of acres with Conservation Plans). Contour farming is the second most recommended practice (18% of all agricultural acres in the watershed and 84% of acres with Conservation Plans). Conservation Practices Filter Strip and grassed waterway are currently enrolled on less than one percent (<1%) of all agricultural acres in the watershed and less than one percent (<1%) of acres with Conservation Plans. Conservation Cover and Prescribed Grazing is currently enrolled on less than one percent (<1%) of all agricultural acres in the watershed and one percent (1%) of acres with Conservation Plans.

Table 3. Best Management Practices currently in use in the Kishacoquillas watershed

PRACTICE NAME	UNIT	NRCS PRACTICE CODE	TOTAL AMOUNT USED IN KISH WATERSHED	% of ag. acres enrolled in the watershed*	% of ag. acres enrolled with Conservation Plans*
Conservation Cover	ac.	327	92.5 ac.	<1	1
Conservation Crop	ac.	328	6603.8 ac.	20	95
Conservation Tillage	ac.	329	5468.7 ac.	16	79
Contour Farming	ac.	330	5792.9 ac.	18	84
Cover Crop	ac.	340	2572.4 ac.	7	37
Diversion	ft.	362	1265.0 ft.		
Field Border	ft.	386	800.0 ft.		
Filter Strip	ac.	393	6.5 ac.	<1	<1
Grassed Waterway	ac.	412	29.1 ac.	<1	<1
Nutrient Management	ac.	590	4312.4 ac.	13	62
Pasture and Hayland Management	ac.	510	176.0 ac.	<1	2
Prescribed Grazing	ac.	528A	112.0 ac.	<1	1
Residue Management	ac.	344	4836.0 ac.	15	70
Roof Runoff Management	no.	558	2		
Stripcropping Contour	ac.	585	1914.8 ac.	5	28
Stripcropping Field	ac.	586	238.5 ac.	<1	3
Structure for Water	no.	587	7		
.Subsurface Drain	ft.	606	3335.0 ft.		
Underground Outlet	ft.	620	4.2 ac. 3476 ft.		
Waste Management	no.	312	2		
Waste Storage Facility	no.	313	4		

**Gray boxes indicate information not available at time of publication*

If there are only 21 different practices in use, then only 16% of the 176 approved BMP's are being utilized in the watershed. While we are pleased to see so many acres (4836.0 acres) using the Seasonal Residue Management (CP344), it is disappointing to see so few (6.5 acres) Filter strips (CP393). It is also disappointing to see that no Conservation Plan recommended No-till Residue Management (CP329A). There are only 800 ft. of Field Border (CP386) planned in the Kish watershed.

We believe that the list above does not accurately reflect the number of BMP's that are currently being used in the watershed. These numbers reflect what is written in current Conservation Plans. Some farmers do not have plans, and others do not have updated plans. Our tally of

Conservation Plans did not include plans written before 1987. Farms that do not have Highly Erodable Land (HEL) do not need Conservation Plans. Many Mennonite and Amish farmers do not participate in government programs and do not have Conservation Plans for their farms; however, many of those farmers do use some of the Best Management Practices.

Many farmers had plans written prior to 1987 and have not had them updated to reflect additional practices they are using. For example, we counted only four waste storage facilities (PC313) written in the Conservation Plans, but the NRCS Technician has worked on 41 waste storage facilities in the watershed. For the past few years, the Chesapeake Bay Technician for the Conservation District and the NRCS Technician have been installing roof runoff management systems and waste storage facilities, however, they are not written in the Conservation Plans, and so they are not reflected here. The Conservation District will continue to work with NRCS to promote Conservation Plans and additional BMP's.

A list of 10 new non-traditional BMPs is currently being developed. Some Mifflin County farmers participated in a No - Till Pilot Program in 2004 and 2005. In addition to Advanced No-Till, other BMPs on the list include Mortality Composter, Precision Rotational Grazing, Precision Agricultural Management, and Precision Feeding for Dairy. Also included on the list are Agricultural Ammonia Emissions Controls, Horse Pasture Management, and Phytase Feed Additives for Swine, Manure Additives and Manure Transport. The premise is that by using the new BMPs, greater sediment and nutrient reductions will occur in a more cost effective manner.

In 2005 the Conservation District developed a Watershed Implementation Plan for the Upper Kishacoquillas Watershed. This area, encompassing 30 square miles (19,064 acres) and 58.6 stream miles, is almost entirely included on the 303(d) list of impaired waters, with sediment and nutrients from agricultural sources being the main source of impairment. This document, which has been approved by EPA and the DEP Nonpoint Source Implementation (Section 319) Program, provides a roadmap for BMP implementation, and ultimately water quality improvement in this area of Mifflin County (**See Attachment 'A' 319 Watershed Implementation Plan: Upper Kishacoquillas Creek),** . A Growing Greener/319 grant application for Implementation of Ag BMPs is this watershed is currently under review.

Non-Agricultural Sediment and Nutrient Sources

Stormwater Runoff

Uncontrolled stormwater runoff from impervious, and sometimes pervious areas, provides many ways for sediment and nutrient runoff to increase. Stormwater management in Mifflin County has only come to the forefront in land use planning activities in the past 5 to 7 years. During this time many new land developments of various kinds have been reviewed by the County Planning Department, the township Engineer, or the DEP as a part of an NPDES permit.

Act 167, the PA Stormwater Management Act, requires counties to develop comprehensive, watershed-based stormwater management plans that account for the physical characteristics of each watershed, such as hydrology, geology, current and future land use, existing stormwater

problems, etc.. A model stormwater ordinance is part of a complete Act 167 plan, and after the plan is officially adopted by the county and approved by DEP, municipalities within that watershed are required to adopt the plan and ordinance. If they refuse to do so within six months, the state can take enforcement actions against those municipalities, according to the act. Since DEP instituted the Comprehensive Stormwater Management Policy in 2002, Act 167 plans are required to address water quality as well as water quantity issues.

In December of 2003, the Kishacoquillas Creek Watershed Act 167 Plan was adopted by the Mifflin County Commissioners and approved by DEP. This plan affects all or part of nine municipalities within the county. The Kish Creek ordinance requires that any activities falling under these regulations must address water quality and a number of water quality BMPs, such as infiltration, are promoted. Since county adoption, a number of those affected municipalities have adopted the plan and ordinance, and have since been requiring these more progressive BMPs. However, several municipalities have yet to follow suit, and there is no indication that DEP intends to take any actions to rectify the situation.

The Juniata River Watershed and the Jack's Creek Watershed are in need of Act 167 plans. A plan for Jack's Creek was developed in 1995, but there was no follow-up with the municipalities, and water quality issues weren't required at that time. Both the County Planning & Development Office and the Conservation District, partners in the development of the Kish Watershed plan, have expressed the need for further Act 167 plans in these two watersheds, but funding is an issue as Act 167 Planning Grants only cover 50% of the costs associated with plan development. Consequently, many types of stormwater problems are not being addressed in Mifflin County. Until all of Mifflin County realizes that stormwater runoff has the potential for huge negative impacts to water quality, especially in headwater streams, our watercourses will not receive the level of protection that is needed to prevent their continued degradation.

The Conservation District has provided two separate workshops on the issue of Stormwater in an attempt to increase the awareness of stormwater issues. The first workshop, entitled Innovative Stormwater Design Workshop, was held on September 9th and 10th, 2002, and was funded by a Pennsylvania Association of Conservation Districts (PACD) mini-grant. The target audience was primarily developers and municipal officials. The second workshop funded by a PACD mini-grant and DEP's Chesapeake Bay Program Stormwater Management: What You Need to Know was held November 6, 2003. The target audience for this workshop was municipal officials. Mifflin County has 16 Townships and Boroughs and 17 people signed up for the workshop. Speakers represented both government agencies and the private sector and topics ranged from an introduction to stormwater regulations to innovative ideas and new technology.

Innovative stormwater BMP's are slowly making their way into Mifflin County. Porous pavement was installed on 3 acres at a new Auto Auction. Unfortunately this new business did not open, but fortunately, the porous pavement had already been installed thus reducing the impact of the development.

On-lot Septic Systems

Depending on their proximity to watercourses and wetlands, septic systems have the potential to degrade Mifflin County's watercourses. There are no figures available to determining what percentages of on-lot systems are functioning properly.

As a part of the Kish Assessment, the Conservation District looked at water treatment in the upper portion of that watershed. According to the Mifflin County GIS Department, municipal sewer service is provided for 1,985 parcels; 2,231 parcels are recorded as having septic systems; and 1,577 parcels have "neither". Menno Township is currently without a transfer or treatment facility and all portions of the townships are served by on-lot systems. It is interesting to note that when one looks at the number of hookups to municipal sewer sources verses the number of parcels, some of these parcels have multiple hookups. 2,735 municipal sewer hookups are recorded in the Kish watershed on 1,985 parcels. There are 840 in Armagh Township, 1,079 in Brown Township, 816 in Union Township and 0 in Menno Township.

There are a number of outhouses throughout the Kish watershed. A visual survey of Menno Township counted 30 outhouses, although this survey did not determine if these outhouses were in current use, what sort of base they had, or how the waste was being stored or treated. Many of these outhouses were either at private cabins, or Amish households and schools. It is unknown at this time how these outhouses affect water quality.

Driveways/ new home construction

This continues to be an area where complaints originate from, showing that most if not all of Mifflin County has no formal review process to determine if proposed driveways and homes are going to pose any threat to water quality. Our experience has shown that private driveways often are not maintained in such a manner as to prevent sediment from entering the streams.

The Conservation District hosted a workshop on October 7, 2004 entitled Better Site Design: Tools and Techniques. This workshop was presented by the Center for Watershed Protection and was intended as an introduction to county planners and developers to the Better Site Design Concepts that reduce impervious cover, preserve open space, and create a sense of community. Funding was provided by a DEP Growing Greener Grant. The workshop had 18 attendees representing the County Planning Department and 6 Townships and Boroughs in Mifflin County and two people from the Huntingdon County Planning Department. This was a new concept to the attendees and the information was well received

Orchards/ tree farms

While not numerous, orchards and tree farms are similar to general agricultural plowing and tilling operations as related to the potential for nutrient and sediments to reach watercourses. Little information is available documenting the trends associated with orchards and tree farms.

Riparian Buffer removal

Riparian buffer education needs to increase in order to encourage and prevent landowners from removing streambank vegetation. No trend data is available.

Wetland/ floodplain impacts

Increased activities impacting the form and function of wetlands will reduce the role wetlands play in the removal of sediment from waterways during high water conditions where overbank flows are experienced. Increased impact to wetlands also further destroys important ecological habitat types. Despite regulations in place to prevent such, many wetland areas continue to shrink due to human activity in Mifflin County.

Floodplain impacts are usually seen in the form of filling floodplain areas or constructing buildings in those areas. These impacts generally allow for a smaller flood prone area for water to expand and "lose" its erosive energy during high flow events. Although regulated either at the state or local level, many negative impacts to floodplains occur on a regular basis, as is evident from District complaint logs.

Active earthmoving sites (excluding cultivation of fields for agricultural purposes)

Active earthmoving activities in Mifflin County generally occur without any regulatory requirement to have the earthmoving activity reviewed for the potential of sedimentation to watercourses. Generally only those earthmoving activities that require a DEP NPDES permit have any form of project specific review related to the project's potential for the discharge of sediment to receiving watercourses. As earth disturbance activities requiring District review and approval have increased over the last 5 years, it can be accurately assessed that other earth disturbances that were not directly reviewed also increased at the same or higher rate.

Pond Maintenance/ removal

Improper private pond maintenance can be a large source of sediment to watercourses. Private ponds generally store large amounts of sediment from upslope or upstream areas. When ponds are cleaned out, often times the standard practice is to clean out the pond without providing for a way to allow the pond's source of water to be re-directed around the work area in the pond to prevent the clean out operation from stirring up sediment that can be transported downstream. Removal activities often times threaten aquatic life while pond removal occurs and the stream reclaims its channel. There are no data sources available to accurately indicate the rate of pond removal in Mifflin County, although it has been shown that at least one large pond is removed each year and numerous maintenance activities occur throughout the year.

Removal activities have shown serious stream impacts during and after the removal of all size ponds. The standard, recommended practice by the DEP and PFBC is to remove the breastwork of the pond in small, incremental phases and allow the stream to form its own channel as down-cutting takes place. However, as much sediment as possible should be removed from the

impoundment prior to removing the breastwork if the stream ecology is to have minimized impacts.

Timber Harvests

Most timber harvesting operations are not reviewed prior to the start of the harvest by anyone to determine their potential for the discharge of sediment to receiving watercourses. Timber harvests in Mifflin County generally are small in size, however, many are occurring on and around headwater streams. Typically, many timber operations impact streams with sediment washed off some part of the timber harvest road system or landing areas, but due to their nature and that they occur in the wooded areas of the county, are removed from visual observation and the public's eye. Thus, the only way they are reviewed for sedimentation potential is if they are causing obvious downstream impacts and become a formal complaint to the Conservation District or Township. No trend data exists to indicate the rate of logging activities in Mifflin County.

Road Salts/ treatments

Due to the often times direct connectivity to watercourses all along their paths, public roads tend to have the potential for huge impacts to watercourses and their nutrient loads if care is not taken in the application of road treatment activities.

The issue of de-icing chemicals was covered as part of the Conservation District's workshop entitled Landscaping for a Healthy Environment. See Lawn treatments below for more information on this workshop.

Lawn treatments (fertilizers and herbicides)

Both private and public lawns and "green" areas in Mifflin County have the potential to be a nutrient source, depending on the amount, type, and timing of fertilizer and herbicide treatments. The Conservation District hosted a workshop on March 13, 2003 entitled Landscaping for a Healthy Environment that was funded by a PACD mini-grant and DEP's Chesapeake Bay Program. The target audience was landscape contractors, landscape architects, greenhouses, and anyone involved in providing plants or landscaping services. The goal of the workshop was to increase awareness of how landscaping impacts the health of our watersheds, and discuss environmentally friendly alternatives to some of the traditional practices such as chemical fertilizers, pesticides and herbicides. The workshop has 36 attendees and 8 presenters and was well received.

Biosolids application

Biosolids, as a regulated activity, would have little potential for negative nutrient impacts to streams if handled at the local, Conservation District level due to the close proximity of local officials to those areas where Biosolids are being applied. When done properly, biosolids applications have little threat to impact watercourses and water quality. However, this assurance

requires active and frequent involvement of the local Conservation District to ensure compliance in the application process.

Sediment and Nutrient/ Source Reductions

Since its inception in 1956, the Mifflin County Conservation District has served as the primary local source of information and assistance for natural resource related issues. From its beginnings as an agricultural agency providing soil and water conservation planning on farmland, the District has expanded its services and staff to serve clientele from both the farm and non-farm communities. The current list of District programs, both regulatory and non-regulatory, reflects the complex and ever changing environmental and land use issues we face today. That list includes, but is not limited to, the following: watershed restoration, erosion & sediment pollution control, nutrient management, the Chesapeake Bay Program, floodplain management monitoring, the Dirt & Gravel Roads Program, waterways management, land preservation, stormwater management, non-point source pollution, water quality monitoring, land application of biosolids, environmental education, gypsy moth suppression, and West Nile Virus surveillance. Most of these activities have become part of the District's workload within the past ten years.

Current programs/ accomplishments in the county (District and other)/ Remaining and Future Needs/ Approaches to Addressing Those Needs

In 2004 the Mifflin County Conservation District made clear our commitment to future conservation issues facing the county and the state in the development of our Mifflin County Conservation District Strategic Plan. This roadmap of our future goals and objectives portrays a clear picture of the direction the District Board of Directors and Staff would like to take.

- Developed first District strategic plan as of June 2004

Conservation District Outreach to the Agricultural community

The Conservation District works very hard to be accessible to the members of the agricultural community. On farm visits are a regular part of District personnel's time to discuss various programs and BMPs. Informational workshops and field days are also a regular opportunity the Conservation District provides to the agricultural community. In 2004 and 2005 the Conservation District hosted a conference for ag producers entitled Agriculture In the 21st Century. This conference covers many new BMPs that DEP has stated will be a part of the Chesapeake Bay Tributary Strategy. These topics (and BMPs) include potassium levels, ammonia emissions, phytase and precision feeding, rotational grazing, genetics for grazing, no-till, round-up resistant weeds, crop monitoring and precision agriculture. Funding for this conference is provided by a number of sources including DEP's Growing Greener money, the Department of Agriculture, and local vendors and sponsors. This conference has been well received and has become a regular educational opportunity for area farmers.

The District also has several grant proposals pending to fund an aggressive outreach effort to the Amish community in the Upper Kish Watershed. As stated in the Upper Kish Watershed

Implementation Plan (**See Attachment 'A'**), of the 141 farms in the watershed, comprising 11,359 acres, 66% are Amish-owned. Only 71 of those 141 farms have current conservation plans. The District has submitted an Upper Kish Agricultural Compliance Plan proposal (**See Attachment 'B'**) that targets education and outreach to the Amish community, and provides technical assistance, particularly for Conservation Plan development to the 70 farms in the subbasin that do not have current plans.

Table 4. BMPs Installed Using All Funding Sources

PRACTICE NAME	UNIT	PRACTICE CODE	TOTAL AMOUNT USED IN MIFFLIN COUNTY
Barnyard Runoff Controls	System	357	11
*Cover Crop	Acres	327	636
Critical Area Seeding	Acres	342	4
Diversion	Ft.	362	5,425
Filter Strip	Acres	393	5
Heavy Use Area Protection	Acres	561	4.25
Manure Analysis	No.	13	41
*No-Till	Acres	329	386.4
Outlet	Feet	620	5000
Roof Runoff Management	System	558	39
Soil Analysis	No.	13	350
Spring Development	No.	574	1
Stream Fencing	Ft.	382	41,615
Structure for Water Control	No.	587	14
Subsurface Drainage	Feet	606	3,900
Waste Storage Structure	No.	313	41
Waste Transfer	System	634	22
Waterway	Acres	412	12.7

**1st year of a pilot program*

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Chesapeake Bay Program

The Chesapeake Bay Program has been in Mifflin County since 1989. During the last 15 years 35 local farmers have participated. Funding rates have remained at 80% with a $30,000.00 maximum. Through 2004, over $837,000.00 has been paid to Mifflin County farmers. Best Management Practices installed have included manure storage structures, barnyard runoff controls, diversions, waterways, milk house waste handling systems, and roof water management.

Remaining and Future Needs	Most Effective Approaches to Address Needs
Continued funding for Bay Program	1. Show need for $'s through watershed assessments 2. Have BMPs designed in a timely manner

Increase awareness concerning non-point source pollution	Education & Outreach through tours, field days, one on one contact, newsletter
Determine area in county of greatest need	Complete Kish Watershed-based Implementation Plan. At a minimum, revisit remaining watersheds for site assessments.
Implementation of more effective nutrient reducing BMPs	Offer Incentive payments for certain BMPs, for example cover crops, advanced no-till, riparian buffers

Nutrient Management Program

Currently the Mifflin County Conservation District has 42 approved nutrient management plans on file. The plans include 17 CAOs with 4 being CAFOs and 25 volunteers. So far 12 farmers have taken advantage of the Nutrient Management Plan Implementation Grant Program and have received over $700,000.00 in cost share monies. Popularity of this program seems to be growing each year. Funding rates remain at 80% of the project costs or $75,000.00 maximum.

Remaining and Future Needs	**Most Effective Approaches to Address Needs**
Continue to promote Grant Program.	Newspaper articles describing program Farm visits Field Days
Increase number of plans through volunteer participation	Promote participation through farm visits Promote Plan Development Incentives Program
Increase public awareness concerning non-point source	Education & Outreach

EQIP

Although EQIP is a program administered through USDA, the conservation district has assisted with many projects. Assistance is usually provided for site survey, project layout and construction inspections. Since 1996, 11 EQIP contracts have been awarded with $325,803.00 cost shared to Mifflin County farmers.

Remaining and Future Needs	**Most Effective Approaches to Address Needs**
Maintain or strengthen partnership with NRCS	Assistance with project layout, surveying, and construction inspections
Increase farmer awareness of funding	Farmer contacts, newsletters

Project Grass

Funded through Growing Greener, this NRCS program has had a slow start in our county. The program has had 6 farmers express an interest in the program and 3 that have had grazing plans written.

Project Grass I

- Available to landowners anywhere in Mifflin County to install practices related to rotational grazing.
- District is subcontractor to Mid-State RC&D.
- Landowner must have grazing plan developed (available from NRCS grazing specialist).
- 75% cost share, landowner must provide 25%.
- Grant ends 5/25/05.
- $ 12,692.30 total available (MCCD can claim up to 10% or 1,269.23 for administration).

Project Grass II

- Same as Project Grass I, except with an additional $18,055.00 available.

Remaining and Future Needs	**Most Effective Approaches to Address Needs**
More outreach efforts, both media and District sponsored trainings	Pasture walks Newspaper articles workshops organized grazing group for local farmers
More equipment for farmers to borrow to see if it works	Pasture water troughs Portable fencing solar fence chargers Portable shades
Additional money	The program is a good one because it covers all of the aspects of converting to rotational grazing, however some of the BMP's might be better suited for incentives instead of cost-share.
Technical training for District Staff	Money to attend conferences, workshops, pasture walks. These activities are very important not just for the farmer, but also for the District staff so that we can answer questions.

<u>Stream bank Fencing</u>

There are many different programs that offer stream bank fencing

- DEP- this has been the most popular fencing program in the past. It is 100% cost share for the farmer. The minimum requirements were 15 feet from the stream bank. No vegetative planting was done with this program. DEP has increased the width requirements for 2005.
- CREP- New to this county in 2004. This is a 100% cost share program with additional incentives. Plantings are included.
- Game Commission had a fencing program, but they have not done any fencing in this county in a number of years and it is unknown if they still offer this program.

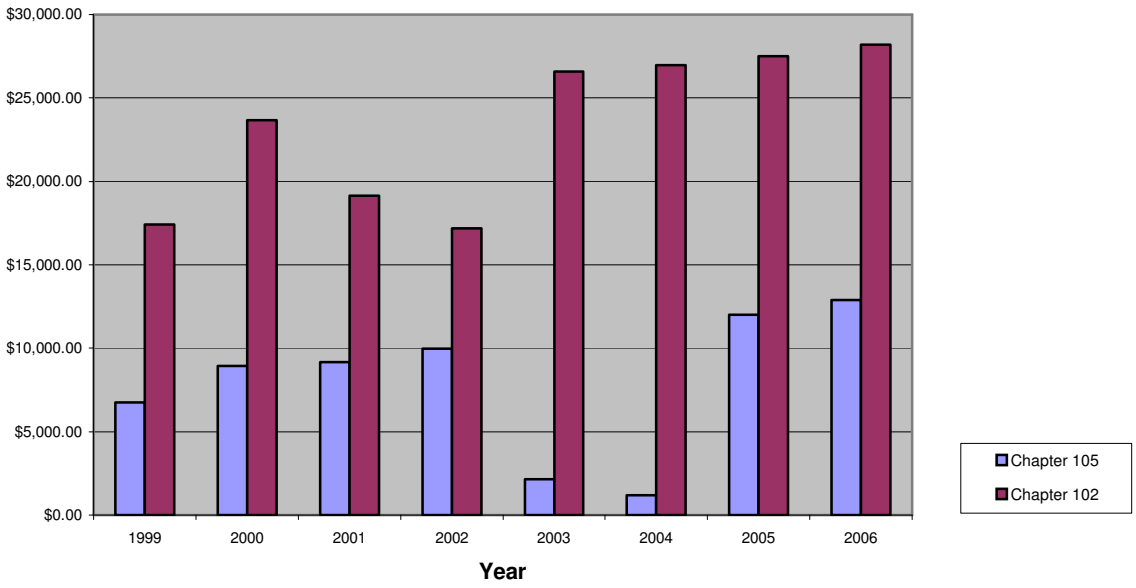
Remaining and Future Needs	Most Effective Approaches to Address Needs
Continuation of the above programs	Provide a variety of programs with a variety of requirements so that more farmers are likely to find a program that meets their needs.
Available staff to promote the idea with local farmers	Talking directly with farmers about the benefits of streambank fencing

Chapter 102/ NPDES/ 105 Programs

- Level II delegation since 1988, program participation since 1979.
- Despite funding sources remaining stagnant or being reduced, District activities have steadily increased over the past 5 years (Figures 1-5).
- Chapter 102; 2000-2004 totals for technical assistance requests, inspections, and plan reviews are 1303, 645, and 117, resp.
- Approximately 45 approved E&S plans currently active in Mifflin County
- Managed E&S, NPDES, and stormwater issues on 1115 acres (656 disturbed), nearly 12 miles, of new PADOT highway construction.
- Managed E&S, NPDES, and stormwater issues on EPA Superfund Site.
- Chapter 105; 597 technical assistance requests (‘00-’04)
- Numerous training/ educational outreach efforts over the past 5 years.
- PADOT Organization Partner of the Year by PADOT Maintenance, Mifflin County.
- Provide Municipal and County stormwater technical assistance for planning and problem-solving purposes

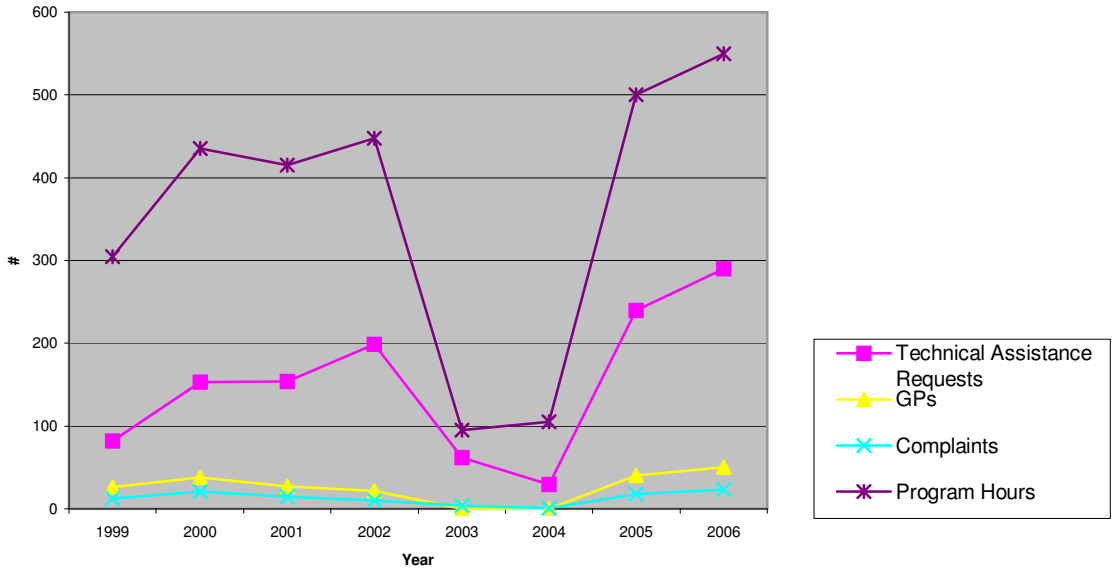
Remaining and Future Needs	Most Effective Approaches to Address Needs
Improved timeliness of E&S plan reviews and permit processing	Ensure each plan is checked for adequacy within 10 days of receipt and that reviews are done within 30 days.
More frequent inspections for earth disturbance sites	Ensure each approved earth disturbance site has a formal review conducted at a minimum of once per month.
More outreach efforts, both media and District sponsored trainings	Meet all ROMs and provide more training to various target audiences.
Township MOUs with more measurables to increase District visibility and involvement	Update all township MOUs in the coming 2 years

Figure 1. Chapter 102/ 105 Program Costs



*MCCD returned Chapter 105 program delegation in January 2003. Projections into '05 and '06 are assuming restored program status.

Figure 2. Chapter 105 trends



*MCCD returned Chapter 105 program delegation in January 2003. Projections into '05 and '06 are assuming restored program status.

Figure 3. Chapter 102 Trends

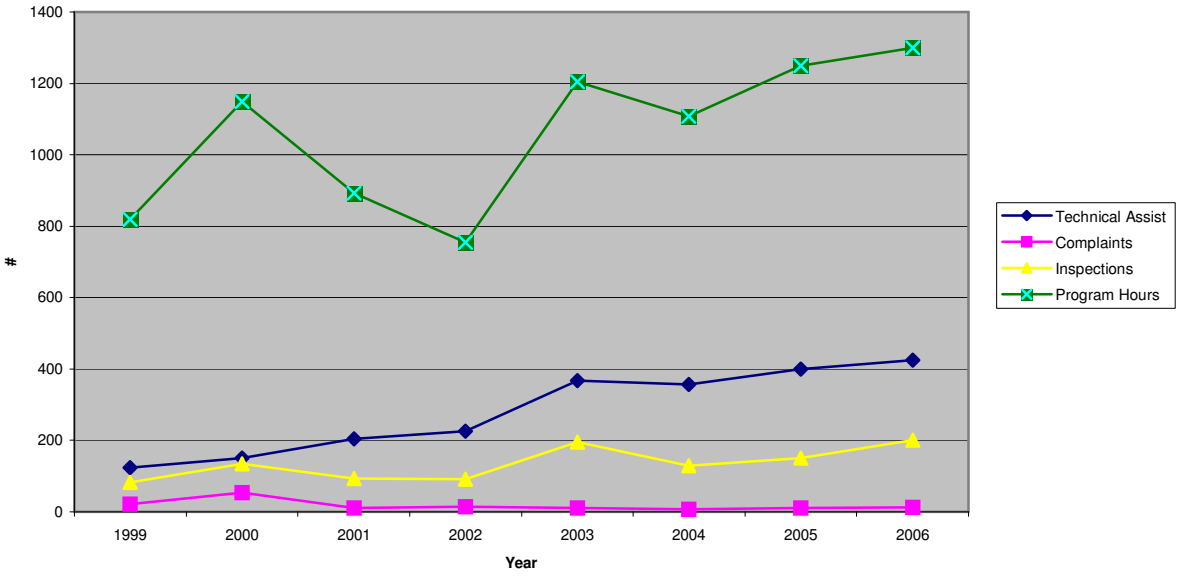


Figure 4. E&S Plan Submission Trends

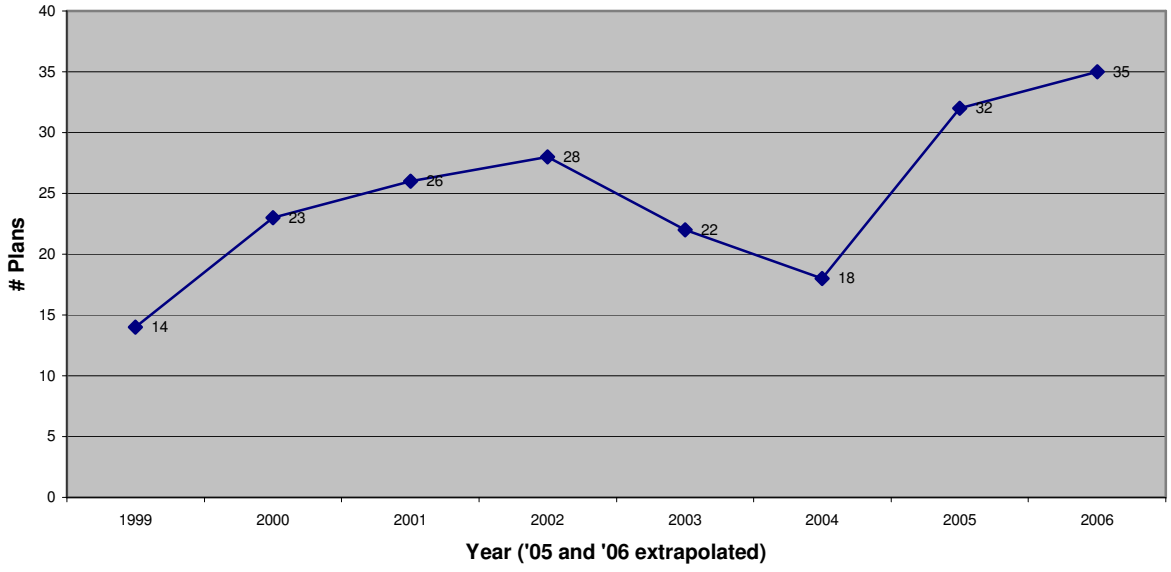
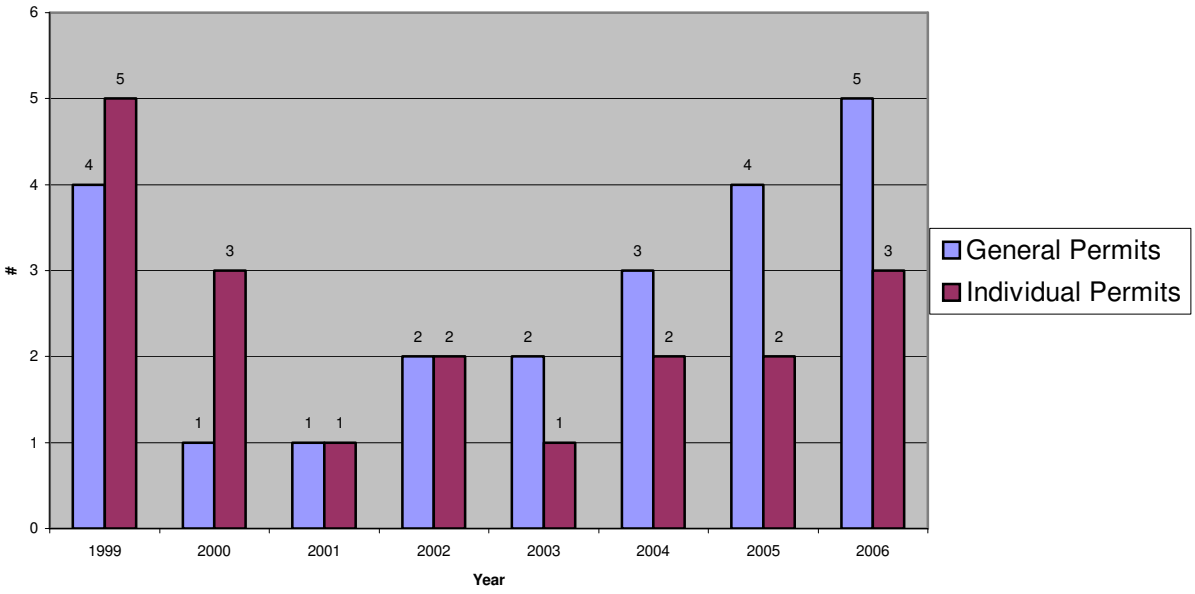


Figure 5. NPDES Permit Activity



D&GR Program

In 1998 the Mifflin County Dirt & Gravel Roads Program was established and to date has the following to its credit:

- $120,000.00 spent on 4 miles of improved miles under the D&GR program
- $45,000.00 contracted projects (current) for over 1 mile of dirt roads
- 2003 recipient of the D&GR program Photo Contest Award.

In 2005, the District, in partnership with the Center for Dirt & Gravel Road Studies at PSU, received a USDA Conservation Innovation Grant in the amount of $215,433 for studying and quantifying the sediment and nutrient run-off reductions from applying environmentally sensitive maintenance practices on private farm lanes and field access roads in the Kishacoquillas Watershed. The District is currently developing project sites throughout the county. The grant will extend through 2008.

Remaining and Future Needs	**Most Effective Approaches to Address Needs**
More efficient and productive D&GR program administration	Establish a new QAB approved application process based on various factors
	Conduct a follow-up assessment
	Educate all townships on the program and its goals

Growing Greener

Many different types of projects have been accomplished under the Growing Greener program. In Mifflin County, Growing Greener grants have included:

1. ***Kishacoquillas Creek Watershed Assessment and Restoration Plan***
   - Included water quality data collection at 59 sample locations
   - Macroinvertebrate surveys at all sample locations
   - Habitat analysis at all sample locations
   - Included funding for installing BMP's on farms ($78,948)
   - Original grant award $190,000.00
2. ***Riparian Buffer Maintenance and Replacement***
   - Available to landowners with livestock who have already fenced the livestock away from the stream
   - This grant helps landowners establish and maintain riparian buffers by planting native species and removing invasive species. Long-term maintenance will be the responsibility of the landowner and plans are written for each landowner with their input.
   - Grant ends 2006
   - $50,000 total available
3. ***Lower Kishacoquillas Creek Watershed Assessment***
   - Awarded to the local Trout Unlimited chapter to assesses the remainder of the Kishacoquillas Creek watershed
4. ***Development of Impervious Surface GIS layer for Mifflin & Juniata Counties***
   - Awarded to the Mifflin County GIS Department
5. ***Mifflin County Watershed Workshop Series for Professionals***
   - Better Site Design – held October 7, 2004
     - for more information on this workshop see Driveways/ new home construction under the Trends of Significance to Water Quality
   - Agriculture in the 21st Century- annual event held in February
     - for more information on this workshop see Conservation District Outreach to the Agricultural community under the Trends of Significance to Water Quality
6. **No-Till/Cover Crop Growing Greener Grant**
   - G2 grant acquired by Juniata Co. CD to promote, provide incentives for farmers to implement no-till, cover cropping systems.
   - Involves Juniata, Perry, & Mifflin CDs.
   - Program ends 6/30/06.
   - $ 26,195.00 available to each county: 4,397.50 salaries & benefits, 547.50 travel, 750.00 educational materials, 500.00 misc. supplies, 20,000 for cost-share program.

The 2004 growing season was the 1st full year of a pilot program designed to build interest in the conservation practices of no-till planting and cover cropping. Mifflin County had 9 farmers enroll a total of 386.4 acres in the no-till program and 21 farmers enroll 580.9 acres in the cover crop program. Although many local farmers are familiar with and use these practices there are still those who are hesitant to give them a try. Cost sharing seemed to provide that extra

incentive for participation. We have already had many inquiries about the availability of the programs for the 2006 growing season.

Remaining and Future Needs	Most Effective Approaches to Address Needs
Continued funding for Growing Greener	Lobby state politicians for continuation of Growing Greener Host field days to take politicians out to see the many different projects funded by Growing Greener Provide materials to politicians on the benefits Growing Greener has had on our environment
	A wider variety of projects have been able to be completed through Growing Greener than through any other funding source.
	A larger audience has been reached (urban, rural, agriculture, developers, etc.) through this funding source than through any other funding source.
	More information has been obtained through this funding source than through any other funding source

Section 319 Grants

1. Village Pride Little Kish Creek Restoration Project

- Original Grant award $235,000.00

2. Little Kish Creek Restoration Project

- Original Grant award $132,243

3. Implementing Best Management Practices in the Kishacoquillas Watershed

- For agricultural conservation practices in the Kish Watershed
- For each participating landowner, District pays 100% of BMP costs up to $ 10,000; costs exceeding $ 10,000 are cost shared at 80% District / 20% landowner.
- Original grant award $ 59,166.00 ($41,425 spent to date)

Remaining and Future Needs	Most Effective Approaches to Address Needs
Continued funding for Section 319	Secure further 319 funding in the future
Available staff to monitor water quality	Teach Conservation District staff how to collect water quality data and other supporting evidence (macroinvertebrate data, sediment sampling, etc) Provide the equipment to collect the data Provide funding for lab analysis of water quality and sediment data
Technical Training for staff	Learn new computer programs (AVNPSTool) Learn about water quality monitoring and the results

Mifflin County Chesapeake Bay Tributary Strategy

Plan of Action to Reduce Sediment and Nutrient Loads

The following table outlines the District's plan of action for each BMP as a timeline and format for reaching our sedimentation and nutrient loading goals. The District intends, assuming adequate state funding is provided for both staff and BMPs, that each of the goals listed below could be met given the following schedule over the course of the next five years. The District fully intends to continue a "business as usual" approach, which means our staff, as always, is committed to funneling every available dollar into the on-the-ground improvements that will be necessary to reach the improved water quality standards our resources deserve. This is how the District has been operating, and it is how it will continue to operate. If increased District output is expected, funding for additional staff and water quality improvements will be needed. The District's plan, quite simply, is to continue to maintain a professional staff dedicated to taking steps each day to improve water quality in Mifflin County while providing any and all available BMP funding to those landowners interested in improving water quality.

Table 5. Draft Tributary Strategy- non-point source BMP Implementation (cumulative totals)

PRACTICE	UNITS	GOALS	TO DATE (2002)	2005 GOALS	2006 GOALS	2007-2009 GOALS	REMAINING
Abandoned Mined Land Reclamation	Acres	137	108	113	119	137	0
Animal Waste Management Systems	AEUs	35,343	14488	18033	22621	35343	0
Carbon Sequestration	Acres	4,044					0
Conservation (Farm) Plans	Acres	37,839	15526	19319	24228	37839	0
Conservation Tillage	Acres	15,179	11904	12461	13181	15179	0
Cover Crops (early)	Acres	13,215	4000	5567	7594	13215	0
Dirt & Gravel Road Practices	Feet	30,597	13200	16157	19985	30597	0
Erosion & Sediment Controls	Acres	189	656	787	918	1312	0
Forest Buffers	Acres	1,901	163	458	841	1901	0
Forest Harvesting Practices	Acres	0	500	600	700	1000	0
Grass Buffers	Acres	1,025	18	189	411	1025	0
Horse Pasture Management	Acres	7,714					0
Land Retirement	Acres	3,463	1058	1467	1996	3463	0
Managed Precision Agriculture	Acres	16,245					0
Mortality Composters	AEUs	0					0
Non-Urban Stream Restoration	Feet	1,048	1700	2040	2380	3400	0

No-Till	Acres	6,782	7000	8400	9800	14000	0
Nutrient Management	Acres	5,697	8798	10558	12317	17596	0
Off Stream Watering w/Fencing	Acres	5,130	455	1250	2278	5130	0
Off Stream Watering w/o Fencing	Acres	3,078	64	576	1239	3078	0
Precision Rotational Grazing	Acres	1,231					0
Rotational grazing	Acres	821	290	380	497	821	0
Septic Denitrification (family units)	Units	4,393	395	1075	1954	4393	0
Street Sweeping	Acres	231					0
SWM – Filtration	Acres	2,757	750	1091	1533	2757	0
SWM - Infiltration practices	Acres	2,757	750	1091	1533	2757	0
SWM - Wet Ponds & Wetlands	Acres	2,757	150	593	1167	2757	0
Tree Planting	Acres	786	829	995	1161	1658	0
Urban Growth Reduction	Acres	140					0
Urban Nutrient Management	Acres	6,271					0
Urban Stream Restoration	Feet	0	2000	2400	2800	4000	0
Wetland Restoration	Acres	57	22	28	36	57	0
Yield Reserve	Acres	5,639					0
Dairy -Precision Feeding	AEUs	17,921					0
Dairy - Ammonia Emission Controls	AEUs	5,974					0
Swine - Phytase Feed Additive	AEUs	16,086					0
Swine - Ammonia Emission Controls	AEUs	8,207					0
Poultry - Phytase Feed Additive	AEUs	1,095					0
Poultry - Ammonia Emission Controls	AEUs	931					0

NOTES

1. BMP implementation is the total implementation, starting from 1985, needed to reach the agreed upon nutrient and sediment reductions. BMP implementation completed since 1985 can be credited against the numbers listed above.
2. AEU = One thousand pounds live weight of livestock or poultry animals, regardless of the actual number of individual animals comprising the unit.
3. Percent of total AEUs for which indicated practice applies: Precision Dairy Feeding, Swine Phytase, Poultry Phytase, Ammonia Emission Reductions – Dairy, Ammonia Emission Reductions – Swine, Ammonia Emission Reductions – Poultry.
4. Total AEUs based on projected 2010 animal units. Projected numbers were developed by Chesapeake Bay Program Office using USDA Agriculture Census data.
5. Gray boxes indicate information availability issues and/ or unclear programmatic understanding of the BMP description.

Table 6. 2006 County Implementation Plan- Non-Point Source BMP Implementation (cumulative totals)

PRACTICE	UNITS	GOALS	TO DATE (2005)	2006 GOALS	2007 GOALS	2008 GOALS	2009 GOALS	2010 GOALS	REMAINING
Abandoned Mined Land Reclamation	Acres	137							
Animal Waste Management Systems	AEUs	35,343							
Carbon Sequestration	Acres	4,044							
Conservation (Farm) Plans	Acres	37,839	19989	23559	27129	30699	34269	37839	0
Conservation Tillage	Acres	15,179	14175	14376	14577	14778	14979	15179	0
Cover Crops (early)	Acres	13,215	**5671**	**7594**	**9094**	**10594**	**12094**	**13,215**	0
Dirt & Gravel Road Practices	Feet	30,597	**21120**	**23015**	**24911**	**26806**	**28702**	**30597**	0
Erosion & Sediment Controls	Acres	189	**1587**	**1662**	**1737**	**1803**	**1874**	**1937**	0
Forest Buffers	Acres	1,901	28	393	768	1143	1518	1901	0
Forest Harvesting Practices	Acres	1000							
Grass Buffers	Acres	1,025	26	226	426	626	826	1025	0
Horse Pasture Management	Acres	7,714							
Land Retirement	Acres	3,463	**2117**	**2386**	**2655**	**2924**	**3193**	**3463**	0
Managed Precision Agriculture	Acres	16,245							
Mortality Composters	AEUs	0							
Non-Urban Stream Restoration	Feet	1,048	**3000**					**3000**	0
No-Till	Acres	6,782	**7897**	**9800**	**10850**	**11900**	**12950**	**14000**	0
Nutrient Management	Acres	5,697	**12671**	**13071**	**13471**	**13871**	**14271**	**14671**	0
Off Stream Watering w/Fencing	Acres	5,130	474	1405	2336	3267	4198	5130	0
Off Stream Watering w/o Fencing	Acres	3,078	64	680	1296	1912	2528	3078	0
Precision Rotational Grazing	Acres	1,231							
Rotational grazing	Acres	821	**643**	**679**	**714**	**750**	**785**	**821**	0
Septic Denitrification (family units)	Units	4,393							
Street Sweeping	Acres	231							
SWM – Filtration	Acres	2,757							
SWM - Infiltration practices	Acres	2,757							
SWM - Wet Ponds & Wetlands	Acres	2,757							
Tree Planting	Acres	786							
Urban Growth Reduction	Acres	140							
Urban Nutrient Management	Acres	6,271							

Urban Stream Restoration	Feet	4000	**4000**					**4000**	0
Wetland Restoration	Acres	57	**35**	**39**	**43**	**48**	**53**	**57**	0
Yield Reserve	Acres	5,639							
Dairy -Precision Feeding	AEUs	17,921							
Dairy - Ammonia Emission Controls	AEUs	5,974							
Swine - Phytase Feed Additive	AEUs	16,086							
Swine - Ammonia Emission Controls	AEUs	8,207							
Poultry - Phytase Feed Additive	AEUs	1,095							
Poultry - Ammonia Emission Controls	AEUs	931							

NOTES

1. BMP implementation is the total implementation, starting from 1985, needed to reach the agreed upon nutrient and sediment reductions. BMP implementation completed since 1985 can be credited against the numbers listed above.
2. AEU = One thousand pounds live weight of livestock or poultry animals, regardless of the actual number of individual animals comprising the unit.
3. Percent of total AEUs for which indicated practice applies: Precision Dairy Feeding, Swine Phytase, Poultry Phytase, Ammonia Emission Reductions – Dairy, Ammonia Emission Reductions – Swine, Ammonia Emission Reductions – Poultry.
4. Total AEUs based on projected 2010 animal units. Projected numbers were developed by Chesapeake Bay Program Office using USDA Agriculture Census data.
5. Gray boxes indicate information availability issues and/ or unclear programmatic understanding of the BMP description.

Table 6 was developed to show the progress made in BMP implementation since 2002. In addition the table lists the yearly goals through 2010.

In 2005 Mifflin County Conservation District selected two specific BMPS to be targeted for Special Project funding. In a study conducted by DEP, no-till and cover crops were identified as two BMPs that would provide maximum environmental benefit per dollar spent. At the end of the first year, cover crop acres planted exceeded the goal set by a little over 100 acres while no- till acres fell short by approximately 500 acres. The conservation district has made several changes with the no-till program and is confident that they will meet or exceed the goals over the next two cropping seasons.

Resources/ Assistance Needed

Because of an increasing number of programs and other areas of District involvement, current staff workloads are at maximum capacity. Some District programs are suffering as a result. Any new programs, or drastic increases in the workloads of current programs could result in the staff's inability to provide the services needed to properly administer these programs. Additional staff time is already needed in the following areas:

- Ag BMP
- Erosion & Sediment Control
- Environmental Education

In order for the Conservation District to successfully implement the Bay Tributary Strategy, a number of needs must be met. The District must have adequate and professional staffing to implement the plan, the tools necessary to implement the plan, training on new aspects of farming and non-farming BMPs that are being promoted in the Chesapeake Bay Tributary Strategy and any appropriate certification. It follows then, that Districts need money to fund staff, provide for materials and equipment, educate the staff, and perhaps most importantly, to install the BMP's themselves. Districts must also have the ability to determine to what degree the efforts put forth are working, "bang-for-your-buck" determinations.

For the Conservation District to function on a professional level, adequate staff funding needs to be provided. Implementation funding for BMP's also needs to remain a priority. Without both types of funding, the District will not be able to make the changes in the county happen. Without adequate funding for materials and equipment, staff, training, and monitoring/studies, the District will not be able to stay in business, or provide the quality service the residents of the county has come to expect. Demands on the current District staff continue to increase, while funding decreases. This method of doing business can only continue so long before the quality of personnel and staff turnover rate at the District reach a point where the goals are no longer being met.

Before initiation of the Bay Tributary Strategy, the District's strategic plan determined a need for 2 additional staff persons based on the immediate workload. In order for this Bay Tributary Strategy to work, a third staff person would be dedicated to promoting nothing but Ag BMP's, as a minimum staffing requirement.

New sources of pollution and new BMP's seem to be popping up daily. Training on what these various BMP are, how they will benefit the user and how they are to be implemented needs to be provided to District staff on a regular basis. If the Conservation Districts are going to be the first line of communication between the residents of the county and the DEP or the EPA, then the District Staff needs to be trained on all aspects of the various programs.

Increasing demand is placed on the Conservation District to provide accurate numbers to various agencies. There are many different methods of tracking numbers that are currently in use. DEP itself has multiple methods of accounting. These different systems put undo burden on District staff and create a variety of re-accounting, which is time consuming and unnecessary. State and

Federal agencies need to communicate to determine which information is necessary and in what format that information needs to be provided. Once this is determined, the database, or "tool" needs to be provided to the Conservation Districts along with adequate training on how this protocol is to work and why it is useful.

The District also needs the support of State agencies such as DEP and PADOT. When support from these two agencies grows thin, the demands on the Conservation District staff are stretched thin also. In the past 5 or so years the District has noticed the following trends: as more and more un-funded mandates are required, as more and higher measureables are set, as more pressure is put on Districts to perform and prove their worth, nearly all forms of State (primarily DEP) funding are being reduced each year. Due to the success of District programs and the increased workloads (which have over doubled in some programs), the District is severely under-staffed if programs are expected to function at peak levels. Having funding reduced with the "do-more-with-less" game, it becomes troublesome for the District to then be asked to do more un-funded work and chastised for not meeting measureables at the end of each program or grant year.

Following is a table of estimated costs for the 2005 budget year and the anticipated state funding provided both for staff and for meeting BMP goals (some programs/ positions rounded for simplicity).

2005 Staffing needs

Position	**Cost to District**	**State Funds Provided**
District Manager	$63,758	$27,000
Administrative Assistant	$35,396	$8,100
Chesapeake Bay Technician	$58,616	$58,616
Watershed Specialist	$50,805	$32,000
Resource Conservation Specialist	$56,692	$16,500
*Environmental Education Specialist	$46,170	$0
*E&S Technician	$46,170	$9,000
*Ag BMP Technician	$46,170	$18,500

**New positions needed at current workloads*

2005 Delegated Programs

Program providing BMPs	**BMP Cost to District**	**State Funds Provided**
Chesapeake Bay Program		$5,000*
Nutrient Management Program		$150,000*
Chapter 102	N/a	N/a
Dirt & Gravel Roads	$25,000.00	$20,993.00
Agland Preservation		
West Nile Virus		
Gypsy Moth Suppression		
Floodplain Monitoring		

**Anticipated 2005 funding*

Expected Results

Each staff person at the Mifflin County Conservation District is working towards one result: Improved water quality. All of the programs that the Conservation District participates in and all of the outreach that occurs are underscored by the motive to prevent pollutants from reaching our water resources. To that end, if the Conservation District has adequate funding to provide office space, equipment, training and salary to its staff, and adequate funding to support the programs, the nutrient and sediment reduction goals can be met. It is at best wishful thinking to imagine that the District can meet any future program goals without having basic staffing and program needs met at a level not provided for to date.

The Mifflin County Conservation District has chosen to focus equal priority on sedimentation and nutrient loading for Mifflin County. District priorities will, as they have in the past, focus around those programs that provide the necessary funding to promote or install water quality improvements on the ground. The District will continue to work diligently to expand our program repertoire in order to meet the growing need of improved water quality protection, not just in the traditional areas such as agriculture.

In order to achieve our desired goals, the District feels the following BMPs will be needed:

BMPs widely accepted and effective at reducing nutrient/ sediment loading in Mifflin County

Animal Waste Management Systems
Barnyard Runoff Control
Conservation (Farm) Plans
Conservation Tillage
Dirt & Gravel Road Practices
Erosion & Sediment Controls
Grass Waterways
Land Retirement
Nutrient Management
Off Stream Watering w/Fencing
Off Stream Watering w/o Fencing
Precision Rotational Grazing
Roof Water Management
Rotation Grazing
Streambank Fencing

BMPs requiring incentives for participation

Ammonia Emission
Cover Crop
Grass Buffers
Manure Testing
No Till
Soil Testing
Streambank Buffers
Wetland Restoration

BMPs utilized on a less-frequent, as-needed basis

Abandoned Mined Land Reclamation
Carbon Sequestration
Forest Buffers
Forest Harvesting Practices
Horse Pasture Management
Managed Precision Agriculture
Mortality Composters
Non-Urban Stream Restoration
Precision Rotational Grazing
Rotational grazing
Septic Denitrification (family units)
Street Sweeping
SWM – Filtration
SWM - Infiltration practices
SWM - Wet Ponds & Wetlands
Tree Planting
Urban Growth Reduction
Urban Nutrient Management
Urban Stream Restoration
Yield Reserve
Dairy -Precision Feeding
Dairy - Ammonia Emission Controls
Swine - Phytase Feed Additive
Swine - Ammonia Emission Controls
Poultry - Phytase Feed Additive
Poultry - Ammonia Emission Controls

Stakeholder Cooperation

The Mifflin County Conservation District prepared this Chesapeake Bay Tributary strategy with input from a variety of sources, including but not limited to, the Department of Environmental Protection, the District Board of Directors, the Natural Resource Conservation Service, and the Mifflin County Planning Department. Phone correspondence took place concerning this strategy on a variety of fronts, and several meetings were held with the DEP to request input, suggestions, and review of the strategy as it was developed.

ATTACHMENT 'A'

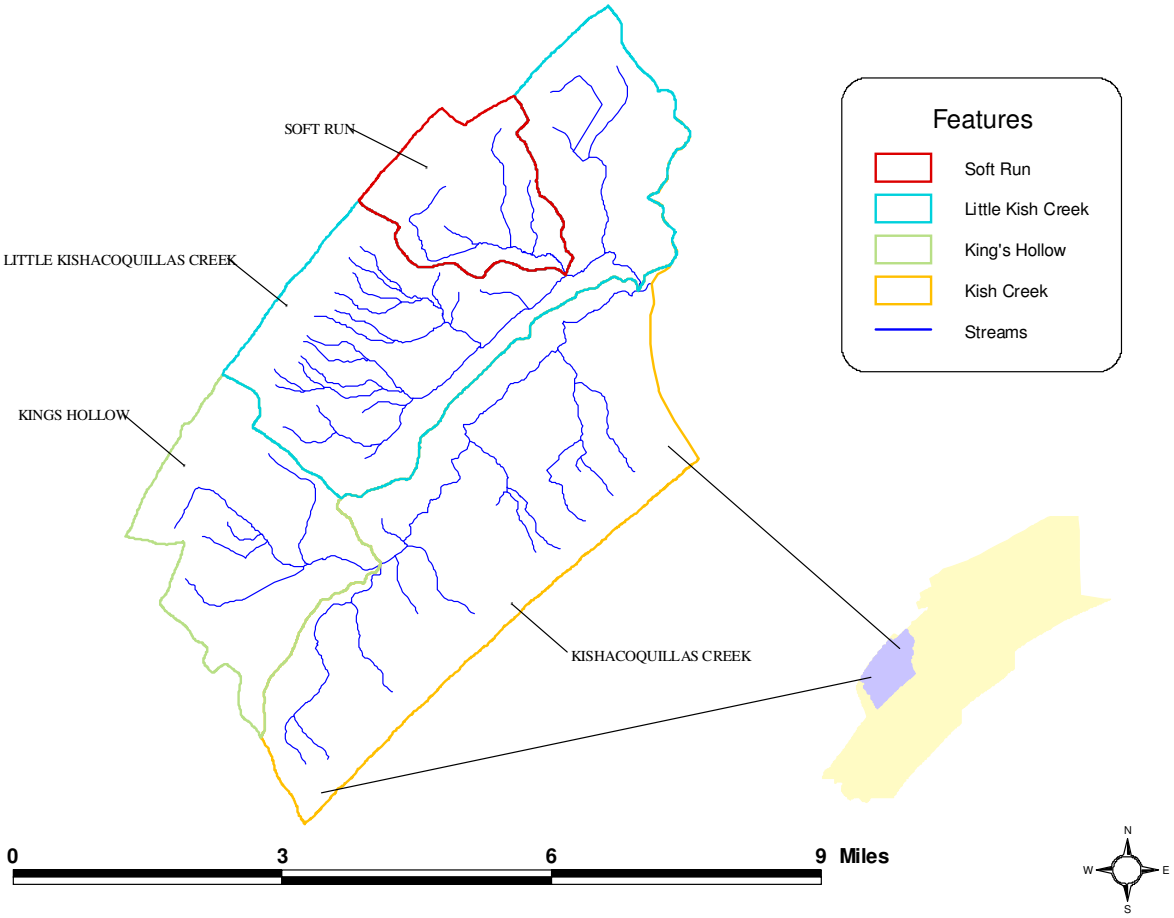
319 WATERSHED IMPLEMENTATION PLAN: UPPER KISHACOQUILLAS CREEK

Watershed Background:

The Upper Kishacoquillas watershed or "Upper Kish" watershed is located within the municipalities of Menno and Union townships in Mifflin County and drains approximately 19,100 acres or 30 square miles of Kishacoquillas Valley, known locally as "Big Valley". The Kishacoquillas Creek (Kish Creek) watershed is not formally divided into the "Upper Kish", so for the purpose of this report The Upper Kish watershed includes the main stem of Kish Creek starting at the New Holland plant in Belleville, Little Kish Creek from the confluence with Kish Creek in Belleville to its source in White Hall, and all of the tributaries flowing into these two streams from Belleville to Allensville including the subwatersheds of King's Hollow, and Soft Run (See Figure 1: Upper Kishacoquillas Creek - Sub-watershed Boundaries, page 3). According to the State Water Plan 12A map, the Kish Creek watershed ends in Allensville. This boundary is not visually distinct, but in Allensville the direction of the flow changes so that the water flows southwest into Saddler Run.

The Upper Kish Watershed is characterized by vast agricultural land use. This is apparent by the 141 farms comprising 11,359 acres of the 19,100 acres of land, or roughly 60% of the total acreage. Because of the relatively large number of farms, sedimentation and nutrient loading through run-off have become a problem in the watershed. Amish farms comprise 7,523 acres (66%) of the agricultural acres in the watershed.

There are 58.6 miles of stream in the Upper Kish watershed. A disproportionate amount (40.9 miles or 70%) are located in agricultural areas. Soil, animal waste, and other substances enter the streams during precipitation events and also as a result of livestock having direct access to the stream. One way to address these issues has been through the development of Best Management Practices or BMP's. Some commonly



prescribed BMP's include waste management systems, cover cropping, conservation tillage, stream bank fencing, and vegetative buffers.

Topography, Geology, and Soils:

Upper Kish Creek is situated in the "Ridge and Valley" physiographic province. The valley itself is formed on an upward fold in the sequence of Cambrian and Ordovician age limestone and dolomite formations. Many of the smaller tributaries of the watershed begin in the forested mountain ridges and flow downward to the valley. These ridges are composed of primarily of sandstone from the Tuscarora, Juniata, and Bald Eagle formations. Since limestone and dolomite are both carbonate bed rock, the

valley is very susceptible to the formation of sink holes, caves, caverns, and depressions caused by the dilution of calcite within the limestone.

The soils in the Upper Kish vary depending on elevation and geology. The predominant soil association in Kishacoquillas Valley is Hagerstown- Opequon- Murrill. Hagerstown soils (42% of the association), is well drained, has moderate permeability, and moderate to high available water capacity. Opequon soils (25 % of the association) is a shallow soil type, has moderate to slow permeability, and very low available water capacity. Because of its shallow nature, it is more prone to erosion and practices to reduce erosion should be used during earth disturbance activities and tillage. Murrill soils (12 % of the association) have moderate permeability and moderate to high available water capacity. Productivity is excellent with the Hagerstown- Opequon- Murrill association however there is a moderate hazard of erosion. Other soil types found in this soil association include Melvin, Newark, Nolin, and Penlaw. These rich valley soils are very productive

The ridges are composed primarily of the Hazleton-Laidig-Buchanan soil association. Slope ranges from 25-70 percent, and the soils are moderately deep, and extremely stony. Hazleton soils (26% of this association) are deep well drained soils. Laidig soils (22% of this association) have moderately slow permeability and moderate available water capacity. Buchanan soils (11% of the association) have slow permeability and moderate available water capacity. All three of these soils are strongly to very strongly acidic throughout un-limed areas. Well drained Dekalb and Leetonia soils, poorly drained Andover soils, and rubble land make up the remaining 41 percent of this association. This association is mainly wooded because it is too stony for cultivation. The places that are less stony are suited to farming uses if adequately managed to control erosion and conserve moisture (Reference: MCCD).

Land Use:

Agriculture (60%), forested land (36%), developed land (approx. 2%), and transitional land (approx. 2%) compose the main land use types in the watershed. The majority of the agriculture land occurs in the lower lying valley with rich, fertile soils.

The majority of developed land is located around the town of Belleville, located at the far eastern end of the watershed.

Water Quality Standards:

Designated uses and the standards for water quality can be found in the Commonwealth of Pennsylvania, Pennsylvania Code, Title 25, Environmental Protection, Chapter 93, Water Quality Standards (Chapter 93). Chapter 93 outlines protected water uses, statewide water uses, and the water quality standards that protected water uses must meet. Kish Creek basin from its source to the confluence with Tea Creek has a designated protected water use classification of Cold Water Fisheries (CWF).

Except where otherwise noted, water quality standards apply to all surface waters. Since the Upper Kish Watershed is classified CWF it must meet specific water quality standards found in Chapter 93 in addition to the standards that all surface waters must meet. These standards differ depending on the classification type of a particular body of water. It is important to note that just because this watershed is not meeting CWF requirements does not mean it can not support a population of cold water fishes, but does mean that they are more susceptible to health threats. For standards specific to CWF refer to Table 1 below.

Table 1. Temperature and Water Quality Standards

Temperature

Critical Use Period	Temperature (^{o}F)
January 1-31	38
February 1-29	38
March 1-31	42
April 1-15	48
April 16-30	52
May 1-15	54
May 16-31	58
June 1-15	60
June 16-30	64
July 1-31	66
August 1-15	66
August 16-30	66
September 1-15	64
September 16-30	60
October 1-15	54

October 16-31	50
November 1-15	46
November 16-30	42
December 1-31	40

Water Quality Standards

Parameter	***Criteria***
Dissolved Oxygen (DO)	AVG 6.0 mg/L daily; minimum 5.0 mg/L daily
Iron (Fe)	30 day AVG of 1.5 mg/L as total recoverable
pH	6.0 to 9.0 inclusive
Alkalinity	Minimum 20 mg/L as $CaCO_3$ (except where natural conditions are less)
Total Dissolved Solids (TDS)	500 mg/L as a monthly AVG value; maximum 750 mg/L

(Reference: Commonwealth of PA)

Assessment of Water Quality:

In accordance with The Clean Water Act, all states must identify and report on water quality. The Pennsylvania Department of Environmental Protection (PA DEP) conducted a statewide survey of unassessed waters to determine if the waters were meeting their designated uses. In this survey the PA DEP sampled macroinvertebrates throughout the watershed and classified streams as either attaining the designated use, or not attaining the designated use thereby being "impaired" (see figures 3 & 4, page 8) (Reference: MCCD). The sub-sheds now identified as the Upper Kish watershed was found to be "impaired" by PA DEP. To view these sub-shed results from the PA DEP 303 (d) designated use attainment sampling for biologic, chemical, and physical parameters see Appendix A. The results of PA DEP's survey helped prompt the Mifflin County Conservation District (Conservation District or MCCD) to apply for a grant to conduct a more comprehensive evaluation of the watershed.

In 2000 the Conservation District began the Kishacoquillas Creek Watershed Assessment and Restoration Plan. As part of this project, chemical, biological, and physical sampling was done over the entire Kish watershed, which included the sub-sheds that make up the "Upper Kish". Chemical sampling was done each month, while macroinvertebrate surveys and habitat evaluations were done yearly. Sampling continued

through summer 2003, when the assessment was completed. Of the sites in the Conservation District assessment, 6 overlap with sample sites used by the PA DEP during their 303 (d) designated use attainment sampling (See Figure 2, Page 7). Particular emphasis will be placed on data from these sites and comparison between 303 (d) and Kish Assessment results. To view results from the Kish assessment for those sites that overlap with PA DEP sites see Appendix B. This data has provided an excellent framework for other studies and projects in the watershed and provides good baseline data for future studies.

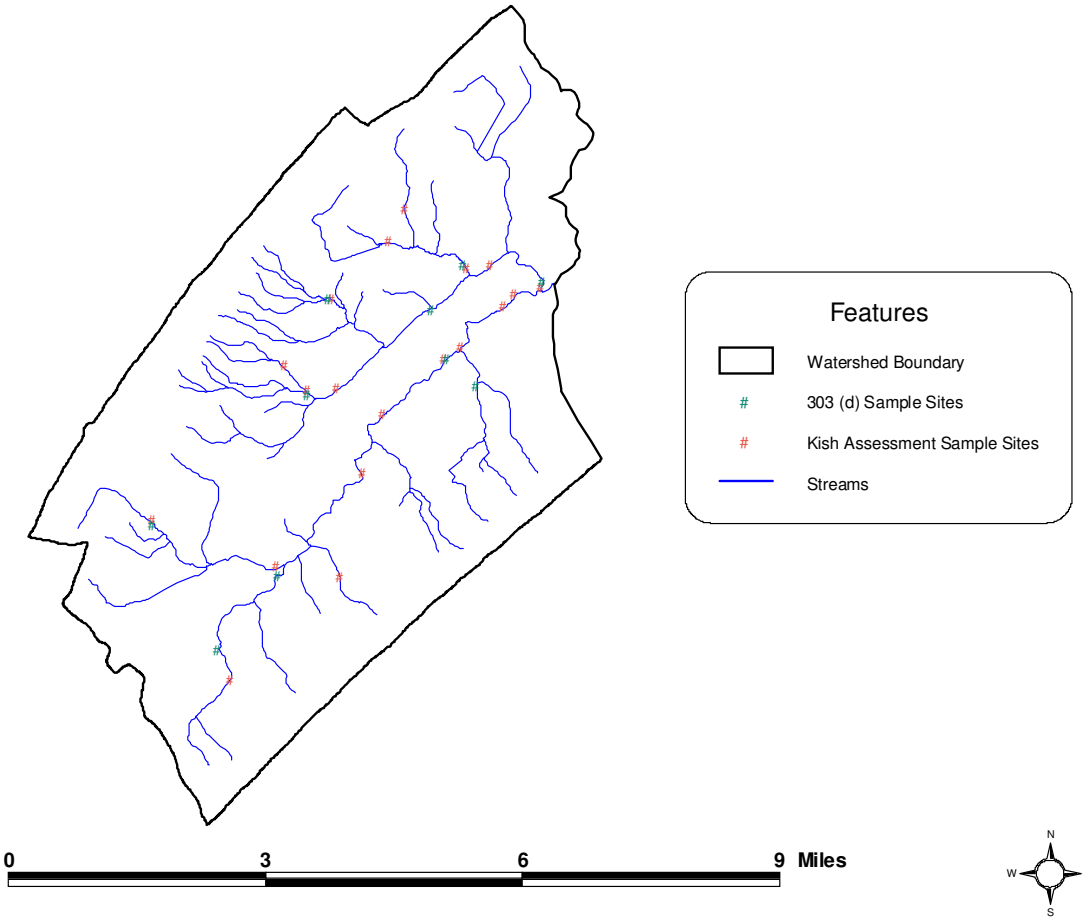


Figure 2: Upper Kishacoquillas Creek - 303 (d) and Kish Assessment Sample Sites

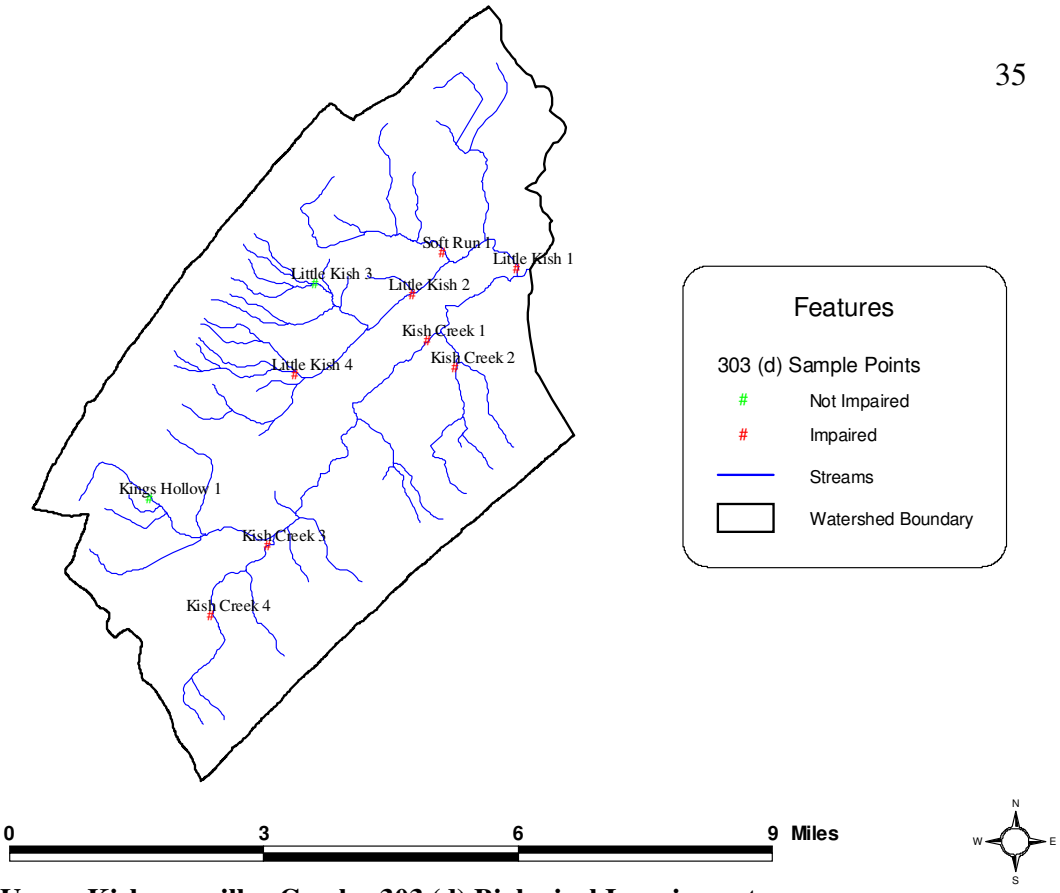


Figure 3: Upper Kishacoquillas Creek - 303 (d) Biological Impairment

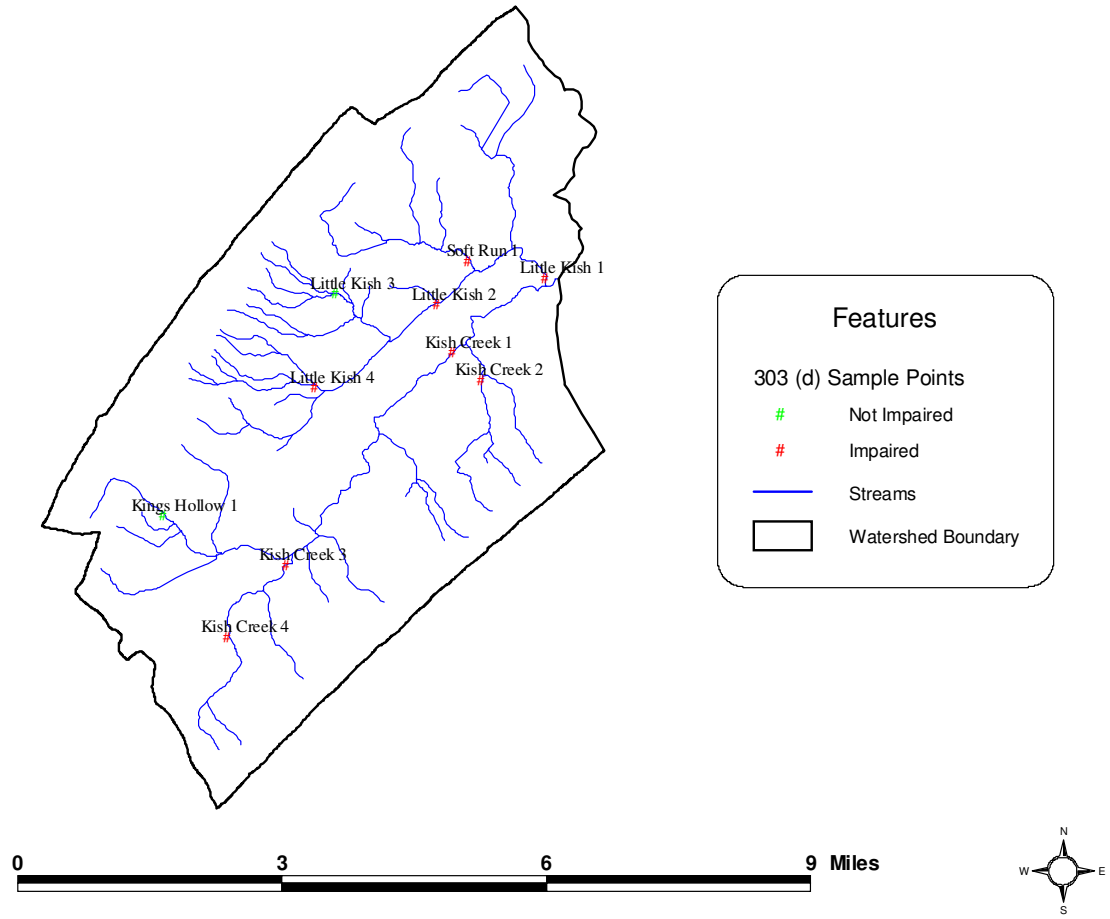


Figure 4: Upper Kishacoquillas Creek - 303 (d) Habitat Impairment

Total Maximum Daily Loads:

The U.S. EPA and (in Pennsylvania) PA DEP must set guidelines and determine conditions that will return impaired waters to a status that meets water quality standards. To accomplish this task, water bodies that do not meet water quality standards may be assigned a total maximum daily load (TMDL) (Clean Water Act Section 303(d)), which quantifies the loading capacity of a water body for a given stressor and ultimately provides a quantitative scheme for allocating loadings among pollutant sources. Nearly the entire Upper Kish watershed was placed on the 303 (d) list of impaired waters.

A TMDL is the sum of the allowable loads of a single pollutant from all contributing point and non-point sources. The calculation must include a margin of safety to ensure that the body of water can be used for the purposes that PA DEP has designated and must also account for seasonal variation in water quality (Reference: EPA-6). TMDL's are established in accordance with the EPA Section 319 (h) of the Clean Water Act and focus on non-point source management.

The goal of a TMDL report is to provide detailed technical and scientific documentation that identifies the water quality impairment and the causes of impairment. An important part of TMDL determination is the use of scientific and mathematic models in conjunction with stream sampling. Current loading rates and TMDL endpoints are determined from the models. Sampling can then be done to check these values and also determine if change is being made over time as the load reductions and additional BMP's are implemented. It is also important that a TMDL be reasonable for the watershed(s) for which they are proposed. Public participation and input is an important factor in TMDL development (Reference: PA DEP-3).

At this time, TMDLs have not been developed for the Upper Kish watershed; however they are expected to be established in the near future. Once completed, the calculated loads will be compared with the loads projected for this watershed by PRedICT and adjustments will be made accordingly.

Problem Identification by Sub-watershed in the Upper Kish

Soft Run:

The Soft Run subwatershed is roughly 1870 acres or 2.92 square miles and is found in the north-northeast section of the Upper Kish (See Figure 1: Upper Kishacoquillas Creek - Sub-watersheds). Currently 5.8 miles of stream are listed on the PA 303 (d) list for impairment due to sedimentation and nutrient loading caused by agriculture, siltation, nutrients, and other habitat alterations. As of May 2000, 29 agricultural BMP's existed in the Soft Run basin, and 2 known BMP's have been added since then.

Little Kish Creek:

The Little Kish Creek subwatershed encompasses approximately 6509 acres or 10.17 square miles of the central and northern sections of the Upper Kish watershed (See Figure 1: Upper Kishacoquillas Creek - Sub-watersheds). Currently 18.7 miles of stream are listed on the PA 303(d) list for impairment due to urban runoff, storm sewers, flow alterations, agriculture, nutrients, siltation, and other habitat alterations. As of May 2000, 55 agricultural BMP's existed, and 71 have been added since then.

King's Hollow:

The King's Hollow subwatershed is located on the far western side of the watershed and includes 3031.53 acres or 5.16 square miles (See Figure 1: Upper Kishacoquillas Creek - Sub-watersheds). Currently 1.65 miles of stream are listed on the PA 303(d) list for impairment due to agriculture, siltation, and nutrients. As of May 2000, 22 agriculture BMP's existed in King's Hollow. 12 BMP's have been added since then.

Kish Creek:

The portion of the Kish Creek watershed located in the Upper Kish watershed covers 7623.07 acres or 11.91 square miles (See Figure 1: Upper Kishacoquillas Creek - Sub-watersheds). Currently 26.5 miles of Kish Creek are listed on the PA 303 (d) list for impairment due to agriculture, siltation, nutrients, hydromodification, construction, flow variability, flow alterations, storm sewers, and urban runoff. As of May 2000, 112 agricultural BMP's existed in the Upper Kish section of the Kish Creek Watershed. Since then, 145 additional BMP's have been installed.

Problem Identification:

Sedimentation and Nutrient Loading

Because of the intensive agricultural use in the watershed, sedimentation and nutrient loading are the primary threats to water quality. Secondary threats include sewage and unpaved roads, which are addressed in the sections following.

Agricultural BMP's are designed to remedy the problems of sedimentation and nutrient loading associated with farming. The Conservation District is working with willing landowners to implement agricultural BMP's to reduce sediment and nutrient loading in the Upper Kish Watershed, with the ultimate goal of meeting the water quality standards for Cold Water Fisheries. In a primarily Amish watershed, reception to this outreach has been slow.

Currently only 71 of the 141 farms in the watershed have conservation plans or farm plans and many of these are not as complete as the district would like. Plans incorporate the various BMP's prescribed for a given farm. In those 71 plans, 449 BMP's are prescribed to be implemented. Most plans identify multiple BMP's, which address the various aspects of farming such as row crops, hay fields, pasture, and animal feeding operations.

Sewage

Sewage is potentially a major issue in the Upper Kish watershed. The only water treatment facility that services the watershed is located in Belleville. It services a total of 816 customers, many of which are not located within the area we have defined as the Upper Kish watershed. Menno Township has no municipal sewer hook-ups at all.

Of the 1563 parcels in the Upper Kish watershed, 365 parcels have municipal sewer hook-ups, 718 parcels have septic systems, and 269 parcels have neither, but do have occupied buildings. There are also roughly 30 known outhouses in the watershed, all of which should technically be considered failing. It is generally believed that septic system malfunction is becoming a considerable problem. This could potentially lead to noteworthy changes in water quality in both surface and ground water.

Unpaved Roads

There are only 1.4 miles of unpaved municipal road within the watershed. However, there are many more miles of privately owned unpaved roads. None of the unpaved municipal roads are managed or protected using the Dirt and Gravel Road Program implemented by the State Conservation Commission in 1997 through State Act 606 and administered locally by the Conservation District. Unpaved roads are a proven source of sedimentation and nutrient loading through run-off.

Water Detention Basins and Constructed Wetlands

The Upper Kish watershed has a lack of water detention basins and constructed wetlands. Efficiency values in PRedICT for both structures rank them as two of the more efficient BMP's, particularly for sediment control. They are also very effective modes of storm water management, allowing storm water and runoff to slowly infiltrate into streams. Prior to 2002, water detention basins had to be created during construction, but did not have to be permanent features. Since then such structures must be permanently installed under law. Because of this relatively new legislation, there are very few of either in the watershed, with only 2 water detention basins and no known constructed wetlands.

Prioritization:

Due to the predominance of agriculture- related reasons for impairment and listing on the 303 (d) list, agricultural practices were given the highest priority for remediation over sewage and unpaved roads. In order to determine which individual farms would receive priority; all farms were ranked on a sliding scale of one to five (See Figure 5, Page 14). A score of one implied that the practices used were not a significant threat to water quality, and a score of five implied that the practices used were a very significant threat to water quality. Categories which were a simple yes or no answer were assigned either a one or a five. Farms were ranked on 7 factors. Those factors were farm size, distance from stream, slope, soil type(s), livestock stream access, having an up-to-date conservation plan, having a concrete barnyard, and having a manure storage tank or waste treatment system. Farms with a higher total score were considered to be of higher priority because they potentially have the greatest negative impact on the watershed, and farms with lower total scores were given a lesser priority. The farms with higher total scores will be evaluated first in an attempt to establish nutrient reducing and cost effective BMP's.

Actual implementation of the prescribed BMP's will be based upon land owner cooperation, permits, cost, feasibility, and availability of technical services. However, farms with highest priority values will still be contacted first, and the District will continue to communicate with the landowner in an attempt to install various BMP's.

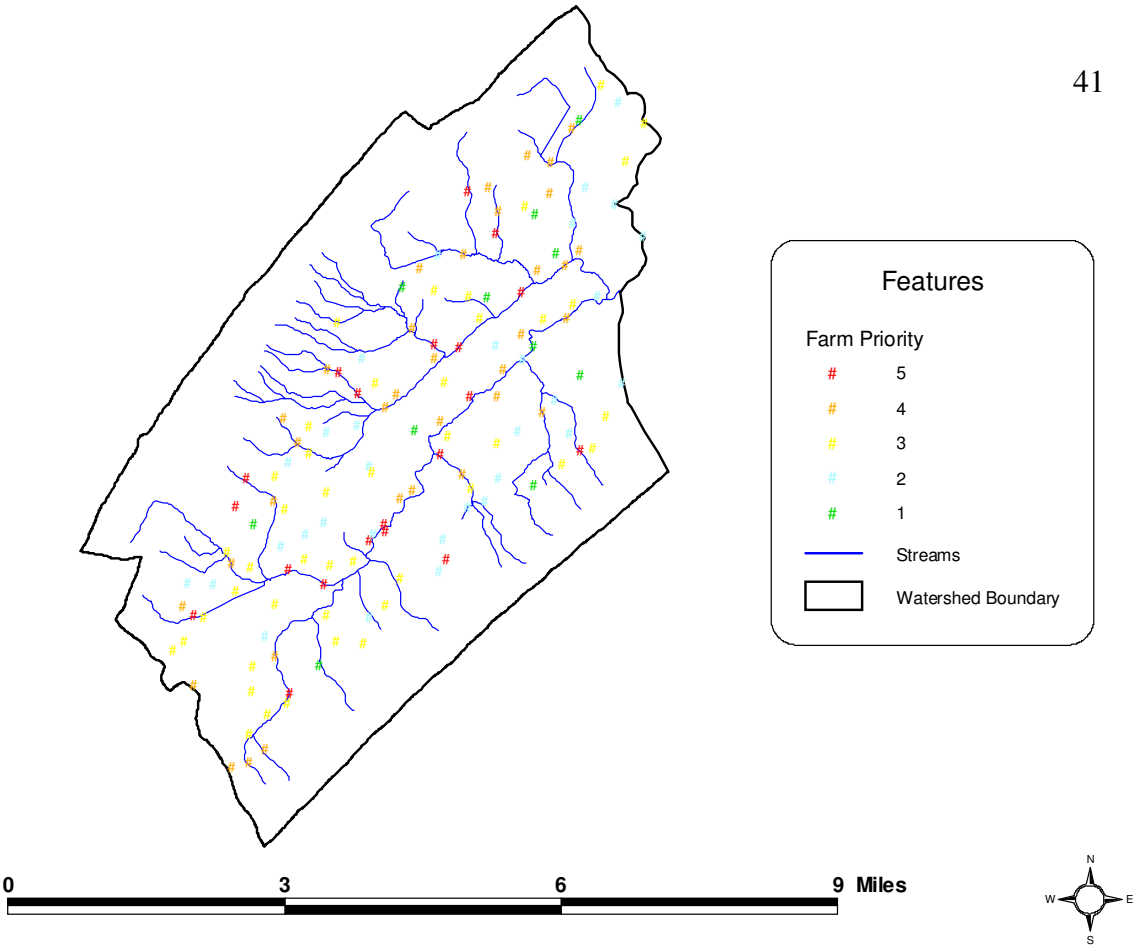


Figure 5: Map of Upper Kishacoquillas Creek – Prioritized Farms

BMP and Watershed Modeling:

A model of the Upper Kish watershed was created using ArcView GIS and additional modeling software created by Penn State University and PA DEP. Initially BMP's were entered into ArcView Non-Point Source Tool (AVNPS Tool). These BMP's were mapped in ArcView using digital orthographic photos, a variety of other ArcView layers, and conservation plans that had been written for specific farms in the watershed. Conservation Plans detail the BMP's installed on a particular farm and include a digital photo and acreage of each practice. A watershed for the Upper Kish was also delineated using ArcView Generalized Watershed Loading Function (AVGWLF) and additional baseline information was determined. A scenario file was then created in AVNPS Tool using this information and the BMP data. This scenario file used the PA DEP unassessed waters date of May 2000 as a reference date or end date for BMP

installation so that load reductions occurring after that date can be credited towards attainment.

The scenario file was then used in the Pollution Reduction Impact Comparison Tool (PRedICT). PRedICT used the data from the AVNPS Tool scenario file and put it into a model that allows one to compare past, present, and future changes in sediment, nitrogen, and phosphorous based on characteristics of installed BMP's as well as other factors such as area, land use, and sewers. PRedICT is able to calculate the percent of acres affected for each BMP in the watershed. In PRedICT, an efficiency value, determined from literature and previous research, has been assigned to eleven individual BMP's plus eight additional practices determined to significantly impact water quality. These are then used to determine the overall impact of these BMP's with the goal of reducing sediment and nutrient loading. PRedICT also calculates estimates of current and future project costs, based on current prices, which can be altered by the user as needed.

Management Measures:

Table 2 (below) shows the BMP's that were installed between January 1990 and May 2000 (active BMP contracts). Table 3 (page 17) shows BMP's installed between May 2000 and Spring 2005.

Table 2. Best Management Practices (BMP's) Projects Completed From January 1990 to May 2000:

BMP Title and Code No.	Total Acreage	Total Feet
Conservation Cover (327)	112.3	---
Conservation Crop Rotation (328)	3214.9	---
Conservation Plan (003)	3652.5	---
Contour Buffer Strips (332)	1257.5	1200
Contour Farming (330)	2792.8	---
Cover Crop (340)	1529.3	---
Fencing (382)	---	655
Grassed Waterway (412)	13.91	---
Nutrient Management (590)	1660.8	745
Residue Management (329)	2867.0	---
Roof Runoff Structure (558)	1.0	640
Streambank and Shoreline Protection (580)	---	825
Water and Sediment Control Basin (638)	2	---
Conservation Tillage (344)	2257.0	---
Animal Waste Management System	12	---
Barnyard/Feed-lot Runoff Control	7	---

Table 3. Best Management Practice (BMP's) Projects Completed From May 2000 to Spring 2005:

BMP Title and Code No.	Total Acreage	Total Feet
Conservation Cover (327)	143.1	---
Conservation Crop Rotation (328)	1999.4	---
Conservation Plan (003)	2123.3	1200
Contour Buffer Strips (332)	415.6	---
Contour Farming (330)	2046.9	---
Cover Crop (340)	1115.8	---
Fencing (382)	---	1865
Filter Strip (393)	1	---
Grassed Waterway (412)	33.1	---
Heavy Use Area Protection (590)	0.3	---
Nutrient Management (590)	2071.3	---
Prescribed Grazing (528)	124.2	---
Residue Management (329)	1496.4	---
Roof Runoff Structure (558)	1.0	200
Water and Sediment Control Basin (638)	3	---
Conservation Tillage (344)	137.0	---
Animal Waste Management System	7	---
Barnyard/Feed-lot Runoff Control	4	---
Riparian Forested Buffers	3	---
Riparian Vegetative Buffers	3	---

Future Management Measures:

Projects Completed or Scheduled for Implementation:

A few projects have recently been completed in the Upper Kish Watershed. Three farms, owned or farmed by J. Irvin Zook, Lynn Neer, and Shawn Yoder, are participants in a Growing Greener grant to establish and maintain riparian buffers. These three buffers equal a total width of approximately 167 feet and total length of 2,134.5 feet.

Two stream restoration projects are occurring on the Little Kish, one at the upper end on Ezra Zook's farm, and the other in Belleville from the bridge over State Route 655 to the confluence with Kishacoquillas Creek. The project on Ezra Zook's farm is restoring approximately 1,374.5 feet of stream. It includes stream fencing, streambank stabilization using practices employed by natural stream design such as log veins and vortex rock weirs, riparian buffer planting, and livestock crossing installation. The stream restoration work will be complete in August 2005, but the riparian buffer installation will wait until cooler weather to plant and is expected to be completed in September or October 2005.

The project in downtown Belleville, initiated by Village Pride, will restore 2,000 feet of stream, 4,000 feet of riparian area, and 9 acres of floodplain. The goal is to turn the largely developed area which now has a cement channel and is prone to flooding into a natural stream design, which will include a park and recreation area. The project encompasses parts of both Little Kish and Kish Creek. Groundbreaking occurred in late July 2005 and a scheduled end date has not yet been set. This if the first project in the Upper Kish watershed in which the focus is not upon agricultural land.

A number of other projects have recently been finished or are scheduled for immediate implementation on five farms in the watershed (see Table 4, Page 19).

Table 4. BMP's scheduled to be installed in 2005 in the Upper Kish watershed

BMP Title and Code No.	Total Acreage	Total Feet
Prescribed Grazing (528a)	17.8	---
Fencing (382)	---	1550
Waste Storage Facility (313)	1	---
Residue Management, Mulch Till (329)	72.2	---
Nutrient Management (590)	72.2	---
Grassed Waterway (412)	.7	---
Residue Management, Seasonal (344)	72.2	---
Cover Crop (340)	72.2	---
Contour Farming (330)	72.2	---
Conservation Crop Rotation (328)	72.2	---
Livestock Stream Crossing	1	---
Roof Water Structure (558)	2	---
Heavy Use Area Protection (561)	.35	---
Barnyard Runoff Control (357)	1	---
Diversion (362)	7.5	---

Technical and Financial Assistance for Proposed BMP's

The estimated cost for each BMP was determined by NRCS projections of costs for Mifflin County and can be found in Table 5 (page 20). These costs were used to estimate total costs of BMP projects in Table 6 (page 22), where the total cost of BMP design, construction, and installation can be seen.

Table 5. Technical and Financial Assistance Needed for BMP Installation

BMP Title	Design & Construction Cost	Annual Operations and Maintenance Cost*	Potential Sources of Funding
Conservation Crop Rotation (328)	$30.00 / acre	$1.20 / acre	Growing Greener, 319 Program, Other available sources
Contour Farming (330)	$7.50 / acre	$.30 / acre	Growing Greener, 319 Program, Other available sources
Nutrient Management (590)	$7.50 / acre	$.30 / acre	Growing Greener, 319 Program, Other available sources
Residue Management, No-Till (329A)	$30.00 / acre	$1.20 / acre	Growing Greener, 319 Program, Other available sources
Cover Crop (340)	$20.00 /acre	$.80 / acre	Growing Greener, 319 Program, Other available sources
Barnyard Run-off Control (357)	$20,000.00	$800.00	Growing Greener, 319 Program, Other available sources
Waste Management System (312)	$13,000.00	$520.00	Growing Greener, 319 Program, Other available sources
Riparian Forested Buffer (391)	$0.55 / foot	$.02 / foot	Growing Greener, 319 Program, Other available sources
Riparian Herbaceous Cover (390)	$0.35 / foot	$.02 / foot	Growing Greener, 319 Program, Other available sources
Fence (382)	$1.50 / foot	$.06 / foot	Growing Greener, 319 Program, Other available sources
Stream Channel Stabilization (584)	$25.00 / foot	$1.00 / foot	Growing Greener, 319 Program, Other available sources

** Operation and maintenance costs calculate at 4% of design and construction cost*

Proposed and Future Projects for Implementation:

Table 6 lists all current and proposed BMP's as well as area and cost for each. Five main BMP's were prescribed for every farm based on the current conservation plans in the watershed. These BMP's are Cover Crop (340), Conservation Crop Rotation (328), Contour Farming (330), Nutrient Management (590), and Residue Management (329). While many farms currently have some type of residue management an emphasis was placed on no-till in the proposed BMP's. Also, in order to reduce sediment, the largest problem source, streambank fencing and riparian buffers were prescribed for any farm that bordered a section of stream. Since barnyard run-off control, waste management systems, waste storage facilities, and water and sediment control basins are all important and efficient BMP's, each farm without one was proposed a Waste Management System (312) and Barnyard Run-off Control (357). These structures were included in the prioritization of farms due to their importance, but are not included in PRedICT. Stream Channel Stabilization (584) is a BMP that is not currently proposed for installation on all farms due to its high cost; however it does have a high efficiency value and would be helpful for many of the tributaries in this watershed because many of them have been artificially altered to accommodate current farming practices.

Ideally all of the proposed BMP's would be installed, but since this is improbable, a BMP compliance rate of 50% is our goal within the next 7 years with a goal of 75% by 2020. We are hoping to meet these goals by implementing our public participation and information section of this plan as well as working with the PA DEP to develop funding sources and cost share contracts for these projects.

Table 6. All of the farms within the Upper Kish Watershed, the BMP's currently in practice, proposed BMP's, area and estimated cost

No.	Rank	Total Acres	Acres Treated	Installed BMP's and Code No.	Proposed Area Treated	Proposed BMP's	Estimated Cost	Total Cost
1	3	70	70	Conservation Crop Rotation (328)	1	Barnyard Run-off Control (357)	$20,000.00	$20,000.00
			70	Contour Buffer Strips (332)	1	Waste Management System (312)	$13,000.00	$13,000.00
			70	Contour Farming (330)	70	Nutrient Management (590)	$7.50	$525.00
			70	Residue Management, Mulch Till (329)	70	Cover Crop (340)	$20.00	$1,400.00
					70	Residue Management, No-Till (329A)	$30.00	$2,100.00
2	4	NA	NA	None	55	Conservation Crop Rotation (328)	$30.00	$1,650.00
					55	Contour Farming (330)	$7.50	$412.50
					55	Residue Management, No-Till (329A)	$30.00	$1,650.00
					55	Nutrient Management (590)	$7.50	$412.50
					55	Cover Crop (340)	$20.00	$1,100.00
					1	Barnyard Run-off Control (357)	$20,000.00	$20,000.00
					1	Waste Management System (312)	$13,000.00	$13,000.00
					900	Riparian Forested Buffer (391)	$0.55	$495.00
					900	Riparian Herbaceous Cover (390)	$0.35	$315.00
					1375	Fence (382)	$1.50	$2,062.50
3	4	NA	NA	None	59	Conservation Crop Rotation (328)	$30.00	$1,770.00
					59	Contour Farming (330)	$7.50	$442.50
					59	Residue Management, No-Till (329A)	$30.00	$1,770.00
					59	Nutrient Management (590)	$7.50	$442.50
					59	Cover Crop (340)	$20.00	$1,180.00
					1	Barnyard Run-off Control (357)	$20,000.00	$20,000.00
					1	Waste Management System (312)	$13,000.00	$13,000.00
					1200	Riparian Forested Buffer (391)	$0.55	$660.00

No.	Rank	Total Acres	Acres Treated	Installed BMP's and Code No.	Proposed Area Treated	Proposed BMP's	Estimated Cost	Total Cost
					1200	Riparian Herbaceous Cover (390)	$0.35	$420.00
					1800	Fence (382)	$1.50	$2,700.00
					1200	Stream Channel Stabilization (584)	$25.00	$30,000.00
4	3	55	1	Waste Management System (312)	52	Conservation Crop Rotation (328)	$30.00	$1,560.00
					52	Contour Farming (330)	$7.50	$390.00
					52	Residue Management, No-Till (329A)	$30.00	$1,560.00
					52	Nutrient Management (590)	$7.50	$390.00
					52	Cover Crop (340)	$20.00	$1,040.00
					1	Barnyard Run-off Control (357)	$20,000.00	$20,000.00
					500	Riparian Forested Buffer (391)	$0.55	$275.00
					500	Riparian Herbaceous Cover (390)	$0.35	$175.00
					500	Fence (382)	$1.50	$750.00
5	2	24.2	24.2	Conservation Crop Rotation (328)	24.2	Residue Management, No-Till (329A)	$30.00	$726.00
			24.2	Contour Buffer Strips (332)	1	Barnyard Run-off Control (357)	$20,000.00	$20,000.00
			24.2	Contour Farming (330)	1000	Fence (382)	$1.50	$1,500.00
			1	Grassed Waterway (412)	24.2	Cover Crop (340)	$20.00	$484.00
			24.2	Nutrient Management (590)				
			1	Water and Sediment Control Basin (638)				
6	2	74.4	74.4	Conservation Crop Rotation (328)	74.4	Residue Management, No-Till (329A)	$30.00	$2,232.00
			74.4	Contour Farming (330)	74.4	Nutrient Management (590)	$7.50	$558.00
			74.4	Cover Crop (340)	1	Barnyard Run-off Control (357)	$20,000.00	$20,000.00
					1	Waste Management System (312)	$13,000.00	$13,000.00
7	3	NA	NA	None	86	Conservation Crop Rotation (328)	$30.00	$2,580.00
					86	Contour Farming (330)	$7.50	$645.00
					86	Residue Management, No-Till	$30.00	$2,580.00

No.	Rank	Total Acres	Acres Treated	Installed BMP's and Code No.	Proposed Area Treated	Proposed BMP's	Estimated Cost	Total Cost
						(329A)		
					86	Nutrient Management (590)	$7.50	$645.00
					86	Cover Crop (340)	$20.00	$1,720.00
					1	Barnyard Run-off Control (357)		
					1	Waste Management System (312)	$13,000.00	$13,000.00
8	3	NA	NA	None	88	Conservation Crop Rotation (328)	$30.00	$2,640.00
					88	Contour Farming (330)	$7.50	$660.00
					88	Residue Management, No-Till (329A)	$30.00	$2,640.00
					88	Nutrient Management (590)	$7.50	$660.00
					88	Cover Crop (340)	$20.00	$1,760.00
					1	Barnyard Run-off Control (357)	$20,000.00	$20,000.00
					1	Waste Management System (312)	$13,000.00	$13,000.00
9	3	NA	NA	None	50	Conservation Crop Rotation (328)	$30.00	$1,500.00
					50	Contour Farming (330)	$7.50	$375.00
					50	Residue Management, No-Till (329A)	$30.00	$1,500.00
					50	Nutrient Management (590)	$7.50	$375.00
					50	Cover Crop (340)	$20.00	$1,000.00
					1	Barnyard Run-off Control (357)	$20,000.00	$20,000.00
					1	Waste Management System (312)	$13,000.00	$13,000.00
					1000	Riparian Forested Buffer (391)	$0.55	$550.00
					1000	Riparian Herbaceous Cover (390)	$0.35	$350.00
					1500	Fence (382)	$1.50	$2,250.00
					1000		$25.00	$25,000.00
10	2	201	158	Contour Buffer Strips (332)	158	Cover Crop (340)	$20.00	$3,160.00
			158	Conservation Crop Rotation (328)	1	Barnyard Run-off Control (357)		
			116	Contour Farming (330)				

No.	Rank	Total Acres	Acres Treated	Installed BMP's and Code No.	Proposed Area Treated	Proposed BMP's	Estimated Cost	Total Cost
			158	Nutrient Management (590)				
			158	Residue Management, Mulch Till (329)				
			1	Waste Management System (312)				
11	3	93.1	93.1	Conservation Crop Rotation (328)	93.1	Cover Crop (340)	$20.00	$1,862.00
			93.1	Contour Farming (330)	1	Barnyard Run-off Control (357)	$20,000.00	$20,000.00
			93.1	Nutrient Management (590)	1	Waste Management System (312)	$13,000.00	$13,000.00
			93.1	Residue Management, Mulch Till (329)				
12	4	NA	NA	None	40	Conservation Crop Rotation (328)	$30.00	$1,200.00
					40	Contour Farming (330)	$7.50	$300.00
					40	Residue Management, No-Till (329A)	$30.00	$1,200.00
					40	Nutrient Management (590)	$7.50	$300.00
					40	Cover Crop (340)	$20.00	$800.00
					1	Barnyard Run-off Control (357)	$20,000.00	$20,000.00
					1	Waste Management System (312)	$13,000.00	$13,000.00
					500	Riparian Forested Buffer (391)	$0.55	$275.00
					500	Riparian Herbaceous Cover (390)	$0.35	$175.00
					500	Fence (382)	$1.50	$750.00
13	4	NA	NA	None	53	Conservation Crop Rotation (328)	$30.00	$1,590.00
					53	Contour Farming (330)	$7.50	$397.50
					53	Residue Management, No-Till (329A)	$30.00	$1,590.00
					53	Nutrient Management (590)	$7.50	$397.50
					53	Cover Crop (340)	$20.00	$1,060.00
					1	Barnyard Run-off Control (357)	$20,000.00	$20,000.00
					1	Waste Management System (312)	$13,000.00	$13,000.00
					480	Riparian Forested Buffer (391)	$0.55	$264.00
					480	Riparian Herbaceous Cover (390)	$0.35	$168.00

No.	Rank	Total Acres	Acres Treated	Installed BMP's and Code No.	Proposed Area Treated	Proposed BMP's	Estimated Cost	Total Cost
					480	Fence (382)	$1.50	$720.00
14	3	NA	NA	None	56	Conservation Crop Rotation (328)	$30.00	$1,680.00
					56	Contour Farming (330)	$7.50	$420.00
					56	Residue Management, No-Till (329A)	$30.00	$1,680.00
					56	Nutrient Management (590)	$7.50	$420.00
					56	Cover Crop (340)	$20.00	$1,120.00
					1	Barnyard Run-off Control (357)	$20,000.00	$20,000.00
					1	Waste Management System (312)	$13,000.00	$13,000.00
					440	Riparian Forested Buffer (391)	$0.55	$242.00
					440	Riparian Herbaceous Cover (390)	$0.35	$154.00
					440	Fence (382)	$1.50	$660.00
15	3	NA	NA	None	6	Conservation Crop Rotation (328)	$30.00	$180.00
					6	Contour Farming (330)	$7.50	$45.00
					6	Residue Management, No-Till (329A)	$30.00	$180.00
					6	Nutrient Management (590)	$7.50	$45.00
					6	Cover Crop (340)	$20.00	$120.00
					1	Barnyard Run-off Control (357)	$20,000.00	$20,000.00
					1	Waste Management System (312)	$13,000.00	$13,000.00
16	3	91.4	91.4	Conservation Crop Rotation (328)	91.4	Residue Management, No-Till (329A)	$30.00	$2,742.00
			88.2	Contour Buffer Strips (332)	91.4	Nutrient Management (590)	$7.50	$685.50
			91.4	Contour Farming (330)	1	Barnyard Run-off Control (357)	$20,000.00	$20,000.00
			91.4	Cover Crop (340)	1	Waste Management System (312)	$13,000.00	$13,000.00
			1	Grassed Waterway (412)	575	Riparian Forested Buffer (391)	$0.55	$316.25
					575	Riparian Herbaceous Cover (390)	$0.35	$201.25
					575	Fence (382)	$1.50	$862.50

No.	Rank	Total Acres	Acres Treated	Installed BMP's and Code No.	Proposed Area Treated	Proposed BMP's	Estimated Cost	Total Cost
17	3	5.1	5.1	Conservation Crop Rotation (328)	5.1	Residue Management, No-Till (329A)	$30.00	$153.00
			5.1	Contour Farming (330)	5.1	Nutrient Management (590)	$7.50	$38.25
			5.1	Cover Crop (340)	760	Riparian Forested Buffer (391)	$0.55	$418.00
					760	Riparian Herbaceous Cover (390)	$0.35	$266.00
					760	Fence (382)	$1.50	$1,140.00
					1	Barnyard Run-off Control (357)	$20,000.00	$20,000.00
					1	Waste Management System (312)	$13,000.00	$13,000.00
18	5	NA	NA	None	69	Conservation Crop Rotation (328)	$30.00	$2,070.00
					69	Contour Farming (330)	$7.50	$517.50
					69	Residue Management, No-Till (329A)	$30.00	$2,070.00
					69	Nutrient Management (590)	$7.50	$517.50
					69	Cover Crop (340)	$20.00	$1,380.00
					1	Barnyard Run-off Control (357)	$20,000.00	$20,000.00
					1	Waste Management System (312)	$13,000.00	$13,000.00
					1000	Riparian Forested Buffer (391)	$0.55	$550.00
					1000	Riparian Herbaceous Cover (390)	$0.35	$350.00
					1500	Fence (382)	$1.50	$2,250.00
19	4	84.1	84.1	Conservation Crop Rotation (328)	1000	Riparian Forested Buffer (391)	$0.55	$550.00
			84.1	Contour Farming (330)	1000	Riparian Herbaceous Cover (390)	$0.35	$350.00
			84.1	Cover Crop (340)	1000	Stream Channel Stabilization (584)	$25.00	$25,000.00
			84.1	Nutrient Management (590)	1400	Fence (382)	$1.50	$2,100.00
			84.1	Residue Management, Mulch Till (329)	1	Barnyard Run-off Control (357)	$20,000.00	$20,000.00
					1	Waste Management System (312)	$13,000.00	$13,000.00
20	3	NA	NA	None	51	Conservation Crop Rotation (328)	$30.00	$1,530.00
					51	Contour Farming (330)	$7.50	$382.50
					51	Residue Management, No-Till	$30.00	$1,530.00

No.	Rank	Total Acres	Acres Treated	Installed BMP's and Code No.	Proposed Area Treated	Proposed BMP's	Estimated Cost	Total Cost
						(329A)		
					51	Nutrient Management (590)	$7.50	$382.50
					51	Cover Crop (340)	$20.00	$1,020.00
					1	Barnyard Run-off Control (357)	$20,000.00	$20,000.00
					1	Waste Management System (312)	$13,000.00	$13,000.00
21	2	14.3	14.3	Conservation Crop Rotation (328)	14.3	Cover Crop (340)	$20.00	$286.00
			14.3	Contour Farming (330)	1	Barnyard Run-off Control (357)	$20,000.00	$20,000.00
			14.3	Nutrient Management (590)	1	Waste Management System (312)	$13,000.00	$13,000.00
			14.3	Residue Management, Mulch Till (329)				
22	2	71.5	71.5	Conservation Crop Rotation (328)	71.5	Cover Crop (340)	$20.00	$1,430.00
			71.5	Contour Buffer Strips (332)	1	Barnyard Run-off Control (357)	$20,000.00	$20,000.00
			71.5	Contour Farming (330)	1	Waste Management System (312)	$13,000.00	$13,000.00
			71.5	Nutrient Management (590)				
			71.5	Residue Management, Mulch Till (329)				
23	2	78.6	78.6	Conservation Crop Rotation (328)	1	Barnyard Run-off Control (357)	$20,000.00	$20,000.00
			78.6	Contour Farming (330)	78.6	Nutrient Management (590)	$7.50	$589.50
			78.6	Cover Crop (340)	1500	Riparian Forested Buffer (391)	$0.55	$825.00
			78.6	Residue Management, Mulch Till (329)	1500	Riparian Herbaceous Cover (390)	$0.35	$525.00
			1	Waste Management System (312)	1900	Fence (382)	$1.50	$2,850.00
24	3	1	1	Barnyard Run-off Control (357)	1400	Riparian Forested Buffer (391)	$0.55	$770.00
					1400	Riparian Herbaceous Cover (390)	$0.35	$490.00
					1500	Fence (382)	$1.50	$2,250.00
					102	Conservation Crop Rotation (328)	$30.00	$3,060.00
					102	Contour Farming (330)	$7.50	$765.00
					102	Residue Management, No-Till (329A)	$30.00	$3,060.00
					102	Nutrient Management (590)	$7.50	$765.00
					102	Cover Crop (340)	$20.00	$2,040.00

No.	Rank	Total Acres	Acres Treated	Installed BMP's and Code No.	Proposed Area Treated	Proposed BMP's	Estimated Cost	Total Cost
					1	Waste Management System (312)	$13,000.00	$13,000.00
25	3	12.3	4.4	Conservation Cover (327)	1200	Riparian Forested Buffer (391)	$0.55	$660.00
			12.3	Conservation Crop Rotation (328)	1200	Riparian Herbaceous Cover (390)	$0.35	$420.00
			7.9	Nutrient Management (590)	1300	Fence (382)	$1.50	$1,950.00
			7.9	Cover Crop (340)	1	Barnyard Run-off Control (357)	$20,000.00	$20,000.00
			7.9	Contour Farming (330)				
			12.3	Residue Management, Mulch Till (329)				
26	5	NA	NA	None	89	Conservation Crop Rotation (328)	$30.00	$2,670.00
					89	Contour Farming (330)	$7.50	$667.50
					89	Residue Management, No-Till (329A)	$30.00	$2,670.00
					89	Nutrient Management (590)	$7.50	$667.50
					89	Cover Crop (340)	$20.00	$1,780.00
					1	Barnyard Run-off Control (357)	$20,000.00	$20,000.00
					1	Waste Management System (312)	$13,000.00	$13,000.00
					1200	Riparian Forested Buffer (391)	$0.55	$660.00
					1200	Riparian Herbaceous Cover (390)	$0.35	$420.00
					1200	Fence (382)	$1.50	$1,800.00
27	5	NA	NA	None	2000	Riparian Forested Buffer (391)	$0.55	$1,100.00
					2000	Riparian Herbaceous Cover (390)	$0.35	$700.00
					2300	Fence (382)	$1.50	$3,450.00
					52	Conservation Crop Rotation (328)	$30.00	$1,560.00
					52	Contour Farming (330)	$7.50	$390.00
					52	Residue Management, No-Till (329A)	$30.00	$1,560.00
					52	Nutrient Management (590)	$7.50	$390.00
					52	Cover Crop (340)	$20.00	$1,040.00
					1	Barnyard Run-off Control (357)	$20,000.00	$20,000.00

No.	Rank	Total Acres	Acres Treated	Installed BMP's and Code No.	Proposed Area Treated	Proposed BMP's	Estimated Cost	Total Cost
					1	Waste Management System (312)	$13,000.00	$13,000.00
28	4	1.9	1.9	Conservation Crop Rotation (328)	3200	Fence (382)	$1.50	$4,800.00
			1.9	Contour Farming (330)	3000	Riparian Forested Buffer (391)	$0.55	$1,650.00
			1.9	Residue Management, Mulch Till (329)	3000	Riparian Herbaceous Cover (390)	$0.35	$1,050.00
					37	Nutrient Management (590)	$7.50	$277.50
					37	Cover Crop (340)	$20.00	$740.00
					1	Barnyard Run-off Control (357)	$20,000.00	$20,000.00
					1	Waste Management System (312)	$13,000.00	$13,000.00
					37	Conservation Crop Rotation (328)	$30.00	$1,110.00
					37	Contour Farming (330)	$7.50	$277.50
					37	Residue Management, Mulch Till (329)	$30.00	$1,110.00
29	3	14.5	14.5	Conservation Crop Rotation (328)	14.5	Cover Crop (340)	$20.00	$290.00
			14.5	Contour Farming (330)	900	Fence (382)	$1.50	$1,350.00
			11.8	Nutrient Management (590)	900	Riparian Forested Buffer (391)	$0.55	$495.00
			14.5	Residue Management, Mulch Till (329)	900	Riparian Herbaceous Cover (390)	$0.35	$315.00
					1	Barnyard Run-off Control (357)	$20,000.00	$20,000.00
					1	Waste Management System (312)	$13,000.00	$13,000.00
30	4	69.4	69.4	Conservation Crop Rotation (328)	69.4	Nutrient Management (590)	$7.50	$520.50
			69.4	Contour Farming (330)	1400	Riparian Forested Buffer (391)	$0.55	$770.00
			1	Grassed Waterway (412)	1400	Riparian Herbaceous Cover (390)	$0.35	$490.00
			69.4	Residue Management, Mulch Till (329)	1400	Fence (382)	$1.50	$2,100.00
					1	Barnyard Run-off Control (357)	$20,000.00	$20,000.00
					1	Waste Management System (312)	$13,000.00	$13,000.00
					69.4	Cover Crop (340)	$20.00	$1,388.00
31	5	NA	NA	None	550	Riparian Forested Buffer (391)	$0.55	$302.50
					550	Riparian Herbaceous Cover (390)	$0.35	$192.50
					600	Fence (382)	$1.50	$900.00

No.	Rank	Total Acres	Acres Treated	Installed BMP's and Code No.	Proposed Area Treated	Proposed BMP's	Estimated Cost	Total Cost
					22	Conservation Crop Rotation (328)	$30.00	$660.00
					22	Contour Farming (330)	$7.50	$165.00
					22	Residue Management, No-Till (329A)	$30.00	$660.00
					22	Nutrient Management (590)	$7.50	$165.00
					22	Cover Crop (340)	$20.00	$440.00
					1	Barnyard Run-off Control (357)	$20,000.00	$20,000.00
					1	Waste Management System (312)	$13,000.00	$13,000.00
32	3	NA	NA	None	1	Barnyard Run-off Control (357)	$20,000.00	$20,000.00
					1	Waste Management System (312)	$13,000.00	$13,000.00
					500	Riparian Forested Buffer (391)	$0.55	$275.00
					500	Riparian Herbaceous Cover (390)	$0.35	$175.00
					600	Fence (382)	$1.50	$900.00
					60	Conservation Crop Rotation (328)	$30.00	$1,800.00
					60	Contour Farming (330)	$7.50	$450.00
					60	Cover Crop (340)	$20.00	$1,200.00
					60	Nutrient Management (590)	$7.50	$450.00
					60	Residue Management, Mulch Till (329)	$30.00	$1,800.00
33	5	NA	NA	None	52	Cover Crop (340)	$20.00	$1,040.00
					1500	Riparian Forested Buffer (391)	$0.55	$825.00
					1500	Riparian Herbaceous Cover (390)	$0.35	$525.00
					1600	Fence (382)	$1.50	$2,400.00
					52	Conservation Crop Rotation (328)	$30.00	$1,560.00
					52	Contour Farming (330)	$7.50	$390.00
					52	Residue Management, No-Till (329A)	$30.00	$1,560.00
					52	Nutrient Management (590)	$7.50	$390.00

No.	Rank	Total Acres	Acres Treated	Installed BMP's and Code No.	Proposed Area Treated	Proposed BMP's	Estimated Cost	Total Cost
					1	Barnyard Run-off Control (357)	$20,000.00	$20,000.00
					1	Waste Management System (312)	$13,000.00	$13,000.00
34	2	84.8	1	Barnyard Runoff Control (357)	84.8	Nutrient Management (590)	$7.50	$636.00
			1	Waste Management System (312)	650	Riparian Forested Buffer (391)	$0.55	$357.50
			84.8	Conservation Crop Rotation (328)	650	Riparian Herbaceous Cover (390)	$0.35	$227.50
			84.8	Contour Farming (330)	650	Fence (382)	$1.50	$975.00
			84.8	Cover Crop (340)				
			84.8	Residue Management, Mulch Till (329)				
35	5	99.2	99.2	Conservation Crop Rotation (328)	99.2	Cover Crop (340)	$20.00	$1,984.00
			99.2	Contour Farming (330)	200	Riparian Forested Buffer (391)	$0.55	$110.00
			99.2	Nutrient Management (590)	200	Riparian Herbaceous Cover (390)	$0.35	$70.00
			99.2	Residue Management, Mulch Till (329)	200	Fence (382)	$1.50	$300.00
					1	Barnyard Run-off Control (357)	$20,000.00	$20,000.00
					1	Waste Management System (312)	$13,000.00	$13,000.00
36	5	NA	NA	None	84	Cover Crop (340)	$20.00	$1,680.00
					450	Riparian Forested Buffer (391)	$0.55	$247.50
					450	Riparian Herbaceous Cover (390)	$0.35	$157.50
					450	Fence (382)	$1.50	$675.00
					84	Conservation Crop Rotation (328)	$30.00	$2,520.00
					84	Contour Farming (330)	$7.50	$630.00
					84	Residue Management, No-Till (329A)	$30.00	$2,520.00
					84	Nutrient Management (590)	$7.50	$630.00
					1	Barnyard Run-off Control (357)	$20,000.00	$20,000.00
					1	Waste Management System (312)	$13,000.00	$13,000.00
37	4	73	73	Conservation Crop Rotation (328)	73	Nutrient Management (590)	$7.50	$547.50
			26	Contour Buffer Strips (332)	73	Cover Crop (340)	$20.00	$1,460.00
			64	Contour Farming (330)	1	Barnyard Run-off Control (357)	$20,000.00	$20,000.00

No.	Rank	Total Acres	Acres Treated	Installed BMP's and Code No.	Proposed Area Treated	Proposed BMP's	Estimated Cost	Total Cost
			0.3	Grassed Waterway (412)	1	Waste Management System (312)	$13,000.00	$13,000.00
			73	Residue Management, Mulch Till (329)	2000	Riparian Forested Buffer (391)	$0.55	$1,100.00
					2000	Riparian Herbaceous Cover (390)	$0.35	$700.00
					2100	Fence (382)	$1.50	$3,150.00
38	4	60.3	60.3	Conservation Crop Rotation (328)	1	Barnyard Run-off Control (357)	$20,000.00	$20,000.00
			60.3	Contour Farming (330)	1	Waste Management System (312)	$13,000.00	$13,000.00
			60.3	Cover Crop (340)	1700	Riparian Forested Buffer (391)	$0.55	$935.00
			60.3	Nutrient Management (590)	1700	Riparian Herbaceous Cover (390)	$0.35	$595.00
			60.3	Residue Management, Mulch Till (329)	1700	Fence (382)	$1.50	$2,550.00
39	5	NA	NA	None	60	Cover Crop (340)	$20.00	$1,200.00
					600	Riparian Forested Buffer (391)	$0.55	$330.00
					600	Riparian Herbaceous Cover (390)	$0.35	$210.00
					600	Fence (382)	$1.50	$900.00
					60	Conservation Crop Rotation (328)	$30.00	$1,800.00
					60	Contour Farming (330)	$7.50	$450.00
					60	Residue Management, No-Till (329A)	$30.00	$1,800.00
					60	Nutrient Management (590)	$7.50	$450.00
					1	Barnyard Run-off Control (357)	$20,000.00	$20,000.00
					1	Waste Management System (312)	$13,000.00	$13,000.00
40	4	60.7	60.7	Conservation Crop Rotation (328)	60.7	Cover Crop (340)	$20.00	$1,214.00
			60.7	Contour Farming (330)	1	Barnyard Run-off Control (357)	$20,000.00	$20,000.00
			60.7	Nutrient Management (590)	1	Waste Management System (312)	$13,000.00	$13,000.00
			60.7	Residue Management, Mulch Till (329)	1500	Riparian Forested Buffer (391)	$0.55	$825.00
					1500	Riparian Herbaceous Cover (390)	$0.35	$525.00
					1500	Fence (382)	$1.50	$2,250.00
41	5	NA	NA	None	65	Cover Crop (340)	$20.00	$1,300.00
					900	Riparian Forested Buffer (391)	$0.55	$495.00

No.	Rank	Total Acres	Acres Treated	Installed BMP's and Code No.	Proposed Area Treated	Proposed BMP's	Estimated Cost	Total Cost
					900	Riparian Herbaceous Cover (390)	$0.35	$315.00
					900	Fence (382)	$1.50	$1,350.00
					65	Conservation Crop Rotation (328)	$30.00	$1,950.00
					65	Contour Farming (330)	$7.50	$487.50
					65	Residue Management, No-Till (329A)	$30.00	$1,950.00
					65	Nutrient Management (590)	$7.50	$487.50
					1	Barnyard Run-off Control (357)	$20,000.00	$20,000.00
					1	Waste Management System (312)	$13,000.00	$13,000.00
42	3	62.4	1	Barnyard Runoff Control (357)	800	Riparian Forested Buffer (391)	$0.55	$440.00
			62.4	Conservation Crop Rotation (328)	800	Riparian Herbaceous Cover (390)	$0.35	$280.00
			62.4	Contour Farming (330)	800	Fence (382)	$1.50	$1,200.00
			62.4	Nutrient Management (590)	1	Waste Management System (312)	$13,000.00	$13,000.00
			62.4	Residue Management, Mulch Till (329)				
			62.4	Cover Crop (340)				
43	2	99.9	79.9	Conservation Crop Rotation (328)	1	Barnyard Run-off Control (357)	$20,000.00	$20,000.00
			79.9	Contour Farming (330)	1900	Riparian Forested Buffer (391)	$0.55	$1,045.00
			79.9	Cover Crop (340)	1900	Riparian Herbaceous Cover (390)	$0.35	$665.00
			79.9	Nutrient Management (590)				
			79.9	Residue Management, Mulch Till (329)				
			1410	Fence (382)				
			1	Filter Strip (393)				
			0.3	Heavy Use Area Protection (561)				
			1	Waste Management System (312)				
			1	Roof Runoff Structure (558)				
44	2	56.1	56.1	Conservation Crop Rotation (328)	1	Barnyard Run-off Control (357)	$20,000.00	$20,000.00
			56.1	Contour Farming (330)	1500	Riparian Forested Buffer (391)	$0.55	$825.00
			1	Grassed Waterway (412)	1500	Riparian Herbaceous Cover (390)	$0.35	$525.00

No.	Rank	Total Acres	Acres Treated	Installed BMP's and Code No.	Proposed Area Treated	Proposed BMP's	Estimated Cost	Total Cost
			56.1	Nutrient Management (590)	56.1	Residue Management, Mulch Till (329)	$30.00	$1,683.00
			1	Water and Sediment Control Basin (638)	56.1	Cover Crop (340)	$20.00	$1,122.00
					1500	Fence (382)	$1.50	$2,250.00
45	3	61.1	61.1	Conservation Crop Rotation (328)	61.1	Nutrient Management (590)	$7.50	$458.25
			18.2	Contour Buffer Strips (332)	61.1	Cover Crop (340)	$20.00	$1,222.00
			15.5	Contour Farming (330)	700	Fence (382)	$1.50	$1,050.00
			1	Grassed Waterway (412)	700	Riparian Forested Buffer (391)	$0.55	$385.00
			61.1	Residue Management, Mulch Till (329)	700	Riparian Herbaceous Cover (390)	$0.35	$245.00
46	5	NA	NA	None	77	Cover Crop (340)	$20.00	$1,540.00
					700	Riparian Forested Buffer (391)	$0.55	$385.00
					700	Riparian Herbaceous Cover (390)	$0.35	$245.00
					700	Fence (382)	$1.50	$1,050.00
					77	Conservation Crop Rotation (328)	$30.00	$2,310.00
					77	Contour Farming (330)	$7.50	$577.50
					77	Residue Management, No-Till (329A)	$30.00	$2,310.00
					77	Nutrient Management (590)	$7.50	$577.50
					1	Barnyard Run-off Control (357)	$20,000.00	$20,000.00
					1	Waste Management System (312)	$13,000.00	$13,000.00
47	5	NA	NA	None	1100	Riparian Forested Buffer (391)	$0.55	$605.00
					1100	Riparian Herbaceous Cover (390)	$0.35	$385.00
					1100	Fence (382)	$1.50	$1,650.00
					1	Barnyard Run-off Control (357)	$20,000.00	$20,000.00
					1	Waste Management System (312)	$13,000.00	$13,000.00
					25	Conservation Crop Rotation (328)	$30.00	$750.00
					25	Contour Farming (330)	$7.50	$187.50

No.	Rank	Total Acres	Acres Treated	Installed BMP's and Code No.	Proposed Area Treated	Proposed BMP's	Estimated Cost	Total Cost
					25	Residue Management, No-Till (329A)	$30.00	$750.00
					25	Nutrient Management (590)	$7.50	$187.50
					25	Cover Crop (340)	$20.00	$500.00
48	4	NA	NA	None	200	Riparian Forested Buffer (391)	$0.55	$110.00
					200	Riparian Herbaceous Cover (390)	$0.35	$70.00
					200	Fence (382)	$1.50	$300.00
					1	Barnyard Run-off Control (357)	$20,000.00	$20,000.00
					1	Waste Management System (312)	$13,000.00	$13,000.00
					22	Conservation Crop Rotation (328)	$30.00	$660.00
					22	Contour Farming (330)	$7.50	$165.00
					22	Residue Management, No-Till (329A)	$30.00	$660.00
					22	Nutrient Management (590)	$7.50	$165.00
					22	Cover Crop (340)	$20.00	$440.00
49	3	NA	NA	None	550	Riparian Forested Buffer (391)	$0.55	$302.50
					550	Riparian Herbaceous Cover (390)	$0.35	$192.50
					550	Fence (382)	$1.50	$825.00
					1	Barnyard Run-off Control (357)	$20,000.00	$20,000.00
					1	Waste Management System (312)	$13,000.00	$13,000.00
					88	Conservation Crop Rotation (328)	$30.00	$2,640.00
					88	Contour Farming (330)	$7.50	$660.00
					88	Residue Management, No-Till (329A)	$30.00	$2,640.00
					88	Nutrient Management (590)	$7.50	$660.00
					88	Cover Crop (340)	$20.00	$1,760.00
50	4	NA	NA	None	800	Riparian Forested Buffer (391)	$0.55	$440.00
					800	Riparian Herbaceous Cover (390)	$0.35	$280.00

No.	Rank	Total Acres	Acres Treated	Installed BMP's and Code No.	Proposed Area Treated	Proposed BMP's	Estimated Cost	Total Cost
					850	Fence (382)	$1.50	$1,275.00
					1	Barnyard Run-off Control (357)	$20,000.00	$20,000.00
					1	Waste Management System (312)	$13,000.00	$13,000.00
					53	Conservation Crop Rotation (328)	$30.00	$1,590.00
					53	Contour Farming (330)	$7.50	$397.50
					53	Residue Management, No-Till (329A)	$30.00	$1,590.00
					53	Nutrient Management (590)	$7.50	$397.50
					53	Cover Crop (340)	$20.00	$1,060.00
51	4	66.6	40.5	Conservation Crop Rotation (328)	40.5	Residue Management, No-Till (329A)	$30.00	$1,215.00
			40.5	Contour Farming (330)	2300	Riparian Forested Buffer (391)	$0.55	$1,265.00
			40.5	Cover Crop (340)	2300	Riparian Herbaceous Cover (390)	$0.35	$805.00
			40.5	Nutrient Management (590)	2300	Fence (382)	$1.50	$3,450.00
			26.1	Prescribed Grazing (528)	1	Barnyard Run-off Control (357)	$20,000.00	$20,000.00
					1	Waste Management System (312)	$13,000.00	$13,000.00
52	3	51.5	51.5	Conservation Crop Rotation (328)	51.5	Residue Management, No-Till (329A)	$30.00	$1,545.00
			51.5	Contour Farming (330)	875	Riparian Forested Buffer (391)	$0.55	$481.25
			51.5	Cover Crop (340)	875	Riparian Herbaceous Cover (390)	$0.35	$306.25
			51.5	Nutrient Management (590)	875	Fence (382)	$1.50	$1,312.50
					1	Barnyard Run-off Control (357)	$20,000.00	$20,000.00
					1	Waste Management System (312)	$13,000.00	$13,000.00
53	2	NA	NA	Same property as farm 76				
54	4	22.8	22.8	Conservation Crop Rotation (328)	22.8	Cover Crop (340)	$20.00	$456.00
			22.8	Contour Farming (330)	1	Barnyard Run-off Control (357)	$20,000.00	$20,000.00
			22.8	Residue Management, Mulch Till (329)	1	Waste Management System (312)	$13,000.00	$13,000.00
			22.8	Residue Management, Seasonal (344)	22.8	Nutrient Management (590)	$7.50	$171.00

No.	Rank	Total Acres	Acres Treated	Installed BMP's and Code No.	Proposed Area Treated	Proposed BMP's	Estimated Cost	Total Cost
			0.95	Riparian Forested Buffer (391)				
			0.95	Riparian Herbaceous Cover (390)				
			1375	Fence (382)				
			1000	Stream Channel Stabilization (584)				
55	5	NA	NA	None	2200	Riparian Forested Buffer (391)	$0.55	$1,210.00
					2200	Riparian Herbaceous Cover (390)	$0.35	$770.00
					2200	Fence (382)	$1.50	$3,300.00
					1	Barnyard Run-off Control (357)	$20,000.00	$20,000.00
					1	Waste Management System (312)	$13,000.00	$13,000.00
					69	Conservation Crop Rotation (328)	$30.00	$2,070.00
					69	Contour Farming (330)	$7.50	$517.50
					69	Residue Management, No-Till (329A)	$30.00	$2,070.00
					69	Nutrient Management (590)	$7.50	$517.50
					69	Cover Crop (340)	$20.00	$1,380.00
56	5	NA	NA	None	350	Riparian Forested Buffer (391)	$0.55	$192.50
					350	Riparian Herbaceous Cover (390)	$0.35	$122.50
					350	Fence (382)	$1.50	$525.00
					1	Barnyard Run-off Control (357)	$20,000.00	$20,000.00
					1	Waste Management System (312)	$13,000.00	$13,000.00
					12	Conservation Crop Rotation (328)	$30.00	$360.00
					12	Contour Farming (330)	$7.50	$90.00
					12	Residue Management, No-Till (329A)	$30.00	$360.00
					12	Nutrient Management (590)	$7.50	$90.00
					12	Cover Crop (340)	$20.00	$240.00
57	4	49.7	49.7	Conservation Crop Rotation (328)	2925	Riparian Forested Buffer (391)	$0.55	$1,608.75
			49.7	Contour Farming (330)	2925	Riparian Herbaceous Cover (390)	$0.35	$1,023.75

No.	Rank	Total Acres	Acres Treated	Installed BMP's and Code No.	Proposed Area Treated	Proposed BMP's	Estimated Cost	Total Cost
			49.7	Nutrient Management (590)	2925	Fence (382)	$1.50	$4,387.50
			49.7	Residue Management, Mulch Till (329)	1	Barnyard Run-off Control (357)	$20,000.00	$20,000.00
			49.7	Cover Crop (340)	1	Waste Management System (312)	$13,000.00	$13,000.00
58	4	NA	NA	None	1300	Riparian Forested Buffer (391)	$0.55	$715.00
					1300	Riparian Herbaceous Cover (390)	$0.35	$455.00
					1300	Fence (382)	$1.50	$1,950.00
					1	Barnyard Run-off Control (357)	$20,000.00	$20,000.00
					1	Waste Management System (312)	$13,000.00	$13,000.00
					55	Conservation Crop Rotation (328)	$30.00	$1,650.00
					55	Contour Farming (330)	$7.50	$412.50
					55	Residue Management, No-Till (329A)	$30.00	$1,650.00
					55	Nutrient Management (590)	$7.50	$412.50
					55	Cover Crop (340)	$20.00	$1,100.00
59	1	59.8	59.8	Conservation Crop Rotation (328)	1250	Riparian Forested Buffer (391)	$0.55	$687.50
			59.8	Contour Farming (330)	1250	Riparian Herbaceous Cover (390)	$0.35	$437.50
			59.8	Cover Crop (340)	1250	Fence (382)	$1.50	$1,875.00
			59.8	Nutrient Management (590)				
			59.8	Residue Management, Mulch Till (329)				
			1	Barnyard Run-off Control (357)				
			1	Waste Management System (312)				
60	3	1	1	Barnyard Runoff Control (357)	2800	Riparian Forested Buffer (391)	$0.55	$1,540.00
					2800	Riparian Herbaceous Cover (390)	$0.35	$980.00
					2800	Fence (382)	$1.50	$4,200.00
					1	Waste Management System (312)	$13,000.00	$13,000.00
					61	Conservation Crop Rotation (328)	$30.00	$1,830.00
					61	Contour Farming (330)	$7.50	$457.50
					61	Residue Management, No-Till	$30.00	$1,830.00

No.	Rank	Total Acres	Acres Treated	Installed BMP's and Code No.	Proposed Area Treated	Proposed BMP's	Estimated Cost	Total Cost
						(329A)		
					61	Nutrient Management (590)	$7.50	$457.50
					61	Cover Crop (340)	$20.00	$1,220.00
61	5	NA	NA	None	375	Riparian Forested Buffer (391)	$0.55	$206.25
					375	Riparian Herbaceous Cover (390)	$0.35	$131.25
					375	Fence (382)	$1.50	$562.50
					1	Barnyard Run-off Control (357)	$20,000.00	$20,000.00
					1	Waste Management System (312)	$13,000.00	$13,000.00
					4	Conservation Crop Rotation (328)	$30.00	$120.00
					4	Contour Farming (330)	$7.50	$30.00
					4	Residue Management, No-Till (329A)	$30.00	$120.00
					4	Nutrient Management (590)	$7.50	$30.00
					4	Cover Crop (340)	$20.00	$80.00
62	4	59.3	59.3	Conservation Crop Rotation (328)	59.3	Residue Management, No-Till (329A)	$30.00	$1,779.00
			59.3	Contour Farming (330)	2400	Riparian Forested Buffer (391)	$0.55	$1,320.00
			59.3	Cover Crop (340)	2400	Riparian Herbaceous Cover (390)	$0.35	$840.00
			59.3	Nutrient Management (590)	2400	Fence (382)	$1.50	$3,600.00
					1	Barnyard Run-off Control (357)	$20,000.00	$20,000.00
					1	Waste Management System (312)	$13,000.00	$13,000.00
63	4	NA	NA	None	975	Riparian Forested Buffer (391)	$0.55	$536.25
					975	Riparian Herbaceous Cover (390)	$0.35	$341.25
					975	Fence (382)	$1.50	$1,462.50
					1	Barnyard Run-off Control (357)	$20,000.00	$20,000.00
					1	Waste Management System (312)	$13,000.00	$13,000.00
					55	Conservation Crop Rotation (328)	$30.00	$1,650.00
					55	Contour Farming (330)	$7.50	$412.50

No.	Rank	Total Acres	Acres Treated	Installed BMP's and Code No.	Proposed Area Treated	Proposed BMP's	Estimated Cost	Total Cost
					55	Residue Management, No-Till (329A)	$30.00	$1,650.00
					55	Nutrient Management (590)	$7.50	$412.50
					55	Cover Crop (340)	$20.00	$1,100.00
64	5	NA	NA	None	1600	Riparian Forested Buffer (391)	$0.55	$880.00
					1600	Riparian Herbaceous Cover (390)	$0.35	$560.00
					1600	Fence (382)	$1.50	$2,400.00
					1	Barnyard Run-off Control (357)	$20,000.00	$20,000.00
					1	Waste Management System (312)	$13,000.00	$13,000.00
					83	Conservation Crop Rotation (328)	$30.00	$2,490.00
					83	Contour Farming (330)	$7.50	$622.50
					83	Residue Management, No-Till (329A)	$30.00	$2,490.00
					83	Nutrient Management (590)	$7.50	$622.50
					83	Cover Crop (340)	$20.00	$1,660.00
65	4	58.8	58.8	Contour Buffer Strips (332)	58.8	Conservation Crop Rotation (328)	$30.00	$1,764.00
			58.8	Cover Crop (340)	58.8	Contour Farming (330)	$7.50	$441.00
			2	Grassed Waterway (412)	2200	Riparian Forested Buffer (391)	$0.55	$1,210.00
			7.9	Nutrient Management (590)	2200	Riparian Herbaceous Cover (390)	$0.35	$770.00
			58.8	Residue Management, Mulch Till (329)	2200	Fence (382)	$1.50	$3,300.00
					1	Barnyard Run-off Control (357)	$20,000.00	$20,000.00
					1	Waste Management System (312)	$13,000.00	$13,000.00
66	2	40.1	40.1	Conservation Crop Rotation (328)	40.1	Residue Management, No-Till (329A)	$30.00	$1,203.00
			40.1	Contour Farming (330)	1200	Riparian Forested Buffer (391)	$0.55	$660.00
			40.1	Cover Crop (340)	1200	Riparian Herbaceous Cover (390)	$0.35	$420.00
			40.1	Nutrient Management (590)	1000	Stream Channel Stabilization	$25.00	$25,000.00
			600	Diversion (362)	1200	Fence (382)	$1.50	$1,800.00

No.	Rank	Total Acres	Acres Treated	Installed BMP's and Code No.	Proposed Area Treated	Proposed BMP's	Estimated Cost	Total Cost
			1	Waste Management System (312)	1	Barnyard Run-off Control (357)	$20,000.00	$20,000.00
67	1	1	1	Barnyard Runoff Control (357)	1050	Riparian Forested Buffer (391)	$0.55	$577.50
			1	Waste Management System (312)	1050	Riparian Herbaceous Cover (390)	$0.35	$367.50
					1050	Fence (382)	$1.50	$1,575.00
					68	Conservation Crop Rotation (328)	$30.00	$2,040.00
					68	Contour Farming (330)	$7.50	$510.00
					68	Residue Management, No-Till (329A)	$30.00	$2,040.00
					68	Nutrient Management (590)	$7.50	$510.00
					68	Cover Crop (340)	$20.00	$1,360.00
68	4	NA	NA	None	1100	Riparian Forested Buffer (391)	$0.55	$605.00
					1100	Riparian Herbaceous Cover (390)	$0.35	$385.00
					1100	Fence (382)	$1.50	$1,650.00
					1	Barnyard Run-off Control (357)	$20,000.00	$20,000.00
					1	Waste Management System (312)	$13,000.00	$13,000.00
					45	Conservation Crop Rotation (328)	$30.00	$1,350.00
					45	Contour Farming (330)	$7.50	$337.50
					45	Residue Management, No-Till (329A)	$30.00	$1,350.00
					45	Nutrient Management (590)	$7.50	$337.50
					45	Cover Crop (340)	$20.00	$900.00
69	3	38.3	38.3	Conservation Crop Rotation (328)	38.3	Cover Crop (340)	$20.00	$766.00
			18.6	Contour Buffer Strips (332)	1	Barnyard Run-off Control (357)	$20,000.00	$20,000.00
			38.3	Contour Farming (330)	1	Waste Management System (312)	$13,000.00	$13,000.00
			38.3	Nutrient Management (590)				
			38.3	Residue Management, Mulch Till (329)				
			0.82	Riparian Forested Buffer (391)				

No.	Rank	Total Acres	Acres Treated	Installed BMP's and Code No.	Proposed Area Treated	Proposed BMP's	Estimated Cost	Total Cost
			0.82	Riparian Herbaceous Cover (390)				
			875	Fence (382)				
70	2	51.2	1	Waste Management System (312)	51.2	Cover Crop (340)	$20.00	$1,024.00
			51.2	Conservation Crop Rotation (328)	1	Barnyard Run-off Control (357)	$20,000.00	$20,000.00
			51.2	Contour Farming (330)	1500	Riparian Forested Buffer (391)	$0.55	$825.00
			51.2	Nutrient Management (590)	1500	Riparian Herbaceous Cover (390)	$0.35	$525.00
			51.2	Residue Management, Mulch Till (329)	1500	Fence (382)	$1.50	$2,250.00
71	4	31.6	31.6	Conservation Crop Rotation (328)	31.6	Nutrient Management (590)	$7.50	$237.00
			27.4	Contour Buffer Strips (332)	1300	Riparian Forested Buffer (391)	$0.55	$715.00
			4.2	Contour Farming (330)	1300	Riparian Herbaceous Cover (390)	$0.35	$455.00
			31.6	Cover Crop (340)	1300	Fence (382)	$1.50	$1,950.00
			27.4	Residue Management, Mulch Till (329)				
72	5	NA	NA	None	1600	Riparian Forested Buffer (391)	$0.55	$880.00
					1600	Riparian Herbaceous Cover (390)	$0.35	$560.00
					1600	Fence (382)	$1.50	$2,400.00
					1	Barnyard Run-off Control (357)	$20,000.00	$20,000.00
					1	Waste Management System (312)	$13,000.00	$13,000.00
					92	Conservation Crop Rotation (328)	$30.00	$2,760.00
					92	Contour Farming (330)	$7.50	$690.00
					92	Residue Management, No-Till (329A)	$30.00	$2,760.00
					92	Nutrient Management (590)	$7.50	$690.00
					92	Cover Crop (340)	$20.00	$1,840.00
73	5	NA	NA	None	2225	Riparian Forested Buffer (391)	$0.55	$1,223.75
					2225	Riparian Herbaceous Cover (390)	$0.35	$778.75
					2225	Fence (382)	$1.50	$3,337.50
					1	Barnyard Run-off Control (357)	$20,000.00	$20,000.00
					1	Waste Management System (312)	$13,000.00	$13,000.00

No.	Rank	Total Acres	Acres Treated	Installed BMP's and Code No.	Proposed Area Treated	Proposed BMP's	Estimated Cost	Total Cost
					61	Conservation Crop Rotation (328)	$30.00	$1,830.00
					61	Contour Farming (330)	$7.50	$457.50
					61	Residue Management, No-Till (329A)	$30.00	$1,830.00
					61	Nutrient Management (590)	$7.50	$457.50
					61	Cover Crop (340)	$20.00	$1,220.00
74	4	65.1	36.4	Prescribed Grazing (528)	65.1	Residue Management, No-Till (329A)	$30.00	$1,953.00
			65.1	Conservation Crop Rotation (328)	3200	Riparian Forested Buffer (391)	$0.55	$1,760.00
			65.1	Contour Farming (330)	3200	Riparian Herbaceous Cover (390)	$0.35	$1,120.00
			65.1	Cover Crop (340)	3200	Fence (382)	$1.50	$4,800.00
			65.1	Nutrient Management (590)	1	Barnyard Run-off Control (357)		$0.00
					1	Waste Management System (312)	$13,000.00	$13,000.00
75	3	NA	NA	None	1	Barnyard Run-off Control (357)	$20,000.00	$20,000.00
					1	Waste Management System (312)	$13,000.00	$13,000.00
					60	Conservation Crop Rotation (328)	$30.00	$1,800.00
					60	Contour Farming (330)	$7.50	$450.00
					60	Residue Management, No-Till (329A)	$30.00	$1,800.00
					60	Nutrient Management (590)	$7.50	$450.00
					60	Cover Crop (340)	$20.00	$1,200.00
76	1	193.5	189.5	Conservation Crop Rotation (328)	193.5	Contour Farming (330)	$7.50	$1,451.25
			193.5	Contour Buffer Strips (332)	193.5	Residue Management, No-Till (329A)	$30.00	$5,805.00
			193.5	Cover Crop (340)				
			3	Grassed Waterway (412)				
			193	Nutrient Management (590)				
			193	Residue Management, Mulch Till (329)				
			1	Roof Runoff Structure (558)				

No.	Rank	Total Acres	Acres Treated	Installed BMP's and Code No.	Proposed Area Treated	Proposed BMP's	Estimated Cost	Total Cost
			1	Water and Sediment Control Basin (638)				
77	5	NA	NA	None	1800	Riparian Forested Buffer (391)	$0.55	$990.00
					1800	Riparian Herbaceous Cover (390)	$0.35	$630.00
					1800	Fence (382)	$1.50	$2,700.00
					1	Barnyard Run-off Control (357)	$20,000.00	$20,000.00
					1	Waste Management System (312)	$13,000.00	$13,000.00
					68	Conservation Crop Rotation (328)	$30.00	$2,040.00
					68	Contour Farming (330)	$7.50	$510.00
					68	Residue Management, No-Till (329A)	$30.00	$2,040.00
					68	Nutrient Management (590)	$7.50	$510.00
					68	Cover Crop (340)	$20.00	$1,360.00
78	3	85.7	85.7	Conservation Crop Rotation (328)	85.7	Nutrient Management (590)	$7.50	$642.75
			85.7	Contour Farming (330)	2500	Riparian Forested Buffer (391)	$0.55	$1,375.00
			85.7	Cover Crop (340)	2500	Riparian Herbaceous Cover (390)	$0.35	$875.00
			85.7	Residue Management, Mulch Till (329)	2600	Fence (382)	$1.50	$3,900.00
					1	Barnyard Run-off Control (357)	$20,000.00	$20,000.00
					1	Waste Management System (312)	$13,000.00	$13,000.00
79	2	12.1	12.1	Conservation Crop Rotation (328)	12.1	Cover Crop (340)	$20.00	$242.00
			12.1	Contour Farming (330)	1050	Riparian Forested Buffer (391)	$0.55	$577.50
			12.1	Nutrient Management (590)	1050	Riparian Herbaceous Cover (390)	$0.35	$367.50
			12.1	Residue Management, Mulch Till (329)	1050	Fence (382)	$1.50	$1,575.00
					1	Barnyard Run-off Control (357)	$20,000.00	$20,000.00
					1	Waste Management System (312)	$13,000.00	$13,000.00
80	3	25.7	25.7	Conservation Crop Rotation (328)	25.7	Nutrient Management (590)	$7.50	$192.75
			25.7	Contour Farming (330)	1400	Riparian Forested Buffer (391)	$0.55	$770.00
			17.3	Cover Crop (340)	1400	Riparian Herbaceous Cover (390)	$0.35	$490.00

No.	Rank	Total Acres	Acres Treated	Installed BMP's and Code No.	Proposed Area Treated	Proposed BMP's	Estimated Cost	Total Cost
			0.21	Grassed Waterway (412)	1400	Fence (382)	$1.50	$2,100.00
			25.7	Residue Management, Mulch Till (329)	1	Barnyard Run-off Control (357)	$20,000.00	$20,000.00
					1	Waste Management System (312)	$13,000.00	$13,000.00
81	5	NA	NA	None	2450	Riparian Forested Buffer (391)	$0.55	$1,347.50
					2450	Riparian Herbaceous Cover (390)	$0.35	$857.50
					2450	Fence (382)	$1.50	$3,675.00
					1	Barnyard Run-off Control (357)	$20,000.00	$20,000.00
					1	Waste Management System (312)	$13,000.00	$13,000.00
					44	Conservation Crop Rotation (328)	$30.00	$1,320.00
					44	Contour Farming (330)	$7.50	$330.00
					44	Residue Management, No-Till (329A)	$30.00	$1,320.00
					44	Nutrient Management (590)	$7.50	$330.00
					44	Cover Crop (340)	$20.00	$880.00
82	4	NA	NA	None	1050	Riparian Forested Buffer (391)	$0.55	$577.50
					1050	Riparian Herbaceous Cover (390)	$0.35	$367.50
					1050	Fence (382)	$1.50	$1,575.00
					1	Barnyard Run-off Control (357)	$20,000.00	$20,000.00
					1	Waste Management System (312)	$13,000.00	$13,000.00
					33	Conservation Crop Rotation (328)	$30.00	$990.00
					33	Contour Farming (330)	$7.50	$247.50
					33	Residue Management, No-Till (329A)	$30.00	$990.00
					33	Nutrient Management (590)	$7.50	$247.50
					33	Cover Crop (340)	$20.00	$660.00
83	5	NA	NA	None	2400	Riparian Forested Buffer (391)	$0.55	$1,320.00
					2400	Riparian Herbaceous Cover (390)	$0.35	$840.00
					2400	Fence (382)	$1.50	$3,600.00

No.	Rank	Total Acres	Acres Treated	Installed BMP's and Code No.	Proposed Area Treated	Proposed BMP's	Estimated Cost	Total Cost
					1	Barnyard Run-off Control (357)	$20,000.00	$20,000.00
					1	Waste Management System (312)	$13,000.00	$13,000.00
					67	Conservation Crop Rotation (328)	$30.00	$2,010.00
					67	Contour Farming (330)	$7.50	$502.50
					67	Residue Management, No-Till (329A)	$30.00	$2,010.00
					67	Nutrient Management (590)	$7.50	$502.50
					67	Cover Crop (340)	$20.00	$1,340.00
84	4	16	16	Conservation Crop Rotation (328)	375	Riparian Forested Buffer (391)	$0.55	$206.25
			12	Contour Farming (330)	375	Riparian Herbaceous Cover (390)	$0.35	$131.25
			12	Cover Crop (340)	375	Fence (382)	$1.50	$562.50
			12	Contour Buffer Strips (332)	1	Barnyard Run-off Control (357)	$20,000.00	$20,000.00
			12	Nutrient Management (590)	1	Waste Management System (312)	$13,000.00	$13,000.00
			12	Residue Management, Mulch Till (329)				
85	4	60.4	60.4	Conservation Crop Rotation (328)	1200	Fence (382)	$1.50	$1,800.00
			15.4	Contour Farming (330)	1	Barnyard Run-off Control (357)	$20,000.00	$20,000.00
			7.4	Cover Crop (340)	1	Waste Management System (312)	$13,000.00	$13,000.00
			7.4	Nutrient Management (590)				
			55.4	Residue Management, Mulch Till (329)				
			1200	Contour Buffer Strips (332)				
			825	Streambank and Shoreline Protection (580)				
			0.71	Riparian Forested Buffer (391)				
			0.71	Riparian Herbaceous Cover (390)				
86	4	NA	NA	None	500	Riparian Forested Buffer (391)	$0.55	$275.00
					500	Riparian Herbaceous Cover (390)	$0.35	$175.00
					500	Fence (382)	$1.50	$750.00
					1	Barnyard Run-off Control (357)	$20,000.00	$20,000.00

No.	Rank	Total Acres	Acres Treated	Installed BMP's and Code No.	Proposed Area Treated	Proposed BMP's	Estimated Cost	Total Cost
					1	Waste Management System (312)	$13,000.00	$13,000.00
					3	Conservation Crop Rotation (328)	$30.00	$90.00
					3	Contour Farming (330)	$7.50	$22.50
					3	Residue Management, No-Till (329A)	$30.00	$90.00
					3	Nutrient Management (590)	$7.50	$22.50
					3	Cover Crop (340)	$20.00	$60.00
87	1	68.4	68.4	Conservation Crop Rotation (328)	68.4	Cover Crop (340)	$20.00	$1,368.00
			68.4	Contour Farming (330)	68.4	Residue Management, No-Till (329A)	$30.00	$2,052.00
			26.7	Grassed Waterway (412)	445	Fence (382)	$1.50	$667.50
			68.4	Nutrient Management (590)	1	Barnyard Run-off Control (357)	$20,000.00	$20,000.00
			3.2	Prescribed Grazing (528)				
			445	Riparian Forested Buffer (391)				
			445	Riparian Herbaceous Cover (390)				
			1	Waste Management System (312)				
88	2	50.3	50.3	Conservation Crop Rotation (328)	50.3	Residue Management, No-Till (329A)	$30.00	$1,509.00
			32.3	Contour Buffer Strips (332)	50.3	Nutrient Management (590)	$7.50	$377.25
			18	Contour Farming (330)	50.3	Cover Crop (340)	$20.00	$1,006.00
					1	Barnyard Run-off Control (357)	$20,000.00	$20,000.00
					1	Waste Management System (312)	$13,000.00	$13,000.00
89	1	1	1	Barnyard Runoff Control (357)	1375	Riparian Forested Buffer (391)	$0.55	$756.25
					1375	Riparian Herbaceous Cover (390)	$0.35	$481.25
					1375	Fence (382)	$1.50	$2,062.50
					1	Waste Management System (312)	$13,000.00	$13,000.00
					99	Conservation Crop Rotation (328)	$30.00	$2,970.00
					99	Contour Farming (330)	$7.50	$742.50

No.	Rank	Total Acres	Acres Treated	Installed BMP's and Code No.	Proposed Area Treated	Proposed BMP's	Estimated Cost	Total Cost
					99	Residue Management, No-Till (329A)	$30.00	$2,970.00
					99	Nutrient Management (590)	$7.50	$742.50
					99	Cover Crop (340)	$20.00	$1,980.00
90	4	NA	NA	None	1850	Riparian Forested Buffer (391)	$0.55	$1,017.50
					1850	Riparian Herbaceous Cover (390)	$0.35	$647.50
					1000	Stream Channel Stabilization (584)	$25.00	$25,000.00
					1850	Fence (382)	$1.50	$2,775.00
					1	Barnyard Run-off Control (357)	$20,000.00	$20,000.00
					1	Waste Management System (312)	$13,000.00	$13,000.00
					79	Conservation Crop Rotation (328)	$30.00	$2,370.00
					79	Contour Farming (330)	$7.50	$592.50
					79	Residue Management, No-Till (329A)	$30.00	$2,370.00
					79	Nutrient Management (590)	$7.50	$592.50
					79	Cover Crop (340)	$20.00	$1,580.00
91	1	1	1	Barnyard Runoff Control (357)	250	Riparian Forested Buffer (391)	$0.55	$137.50
			1	Waste Management System (312)	250	Riparian Herbaceous Cover (390)	$0.35	$87.50
					250	Fence (382)	$1.50	$375.00
					70	Conservation Crop Rotation (328)	$30.00	$2,100.00
					70	Contour Farming (330)	$7.50	$525.00
					70	Residue Management, No-Till (329A)	$30.00	$2,100.00
					70	Nutrient Management (590)	$7.50	$525.00
					70	Cover Crop (340)	$20.00	$1,400.00
92	3	NA	NA	None	1900	Riparian Forested Buffer (391)	$0.55	$1,045.00
					1900	Riparian Herbaceous Cover (390)	$0.35	$665.00
					2100	Fence (382)	$1.50	$3,150.00

No.	Rank	Total Acres	Acres Treated	Installed BMP's and Code No.	Proposed Area Treated	Proposed BMP's	Estimated Cost	Total Cost
					1	Barnyard Run-off Control (357)	$20,000.00	$20,000.00
					1	Waste Management System (312)	$13,000.00	$13,000.00
					107	Conservation Crop Rotation (328)	$30.00	$3,210.00
					107	Contour Farming (330)	$7.50	$802.50
					107	Residue Management, No-Till (329A)	$30.00	$3,210.00
					107	Nutrient Management (590)	$7.50	$802.50
					107	Cover Crop (340)	$20.00	$2,140.00
93	3	NA	NA	None	2700	Riparian Forested Buffer (391)	$0.55	$1,485.00
					2700	Riparian Herbaceous Cover (390)	$0.35	$945.00
					2700	Fence (382)	$1.50	$4,050.00
					1	Barnyard Run-off Control (357)	$20,000.00	$20,000.00
					1	Waste Management System (312)	$13,000.00	$13,000.00
					92	Conservation Crop Rotation (328)	$30.00	$2,760.00
					92	Contour Farming (330)	$7.50	$690.00
					92	Residue Management, No-Till (329A)	$30.00	$2,760.00
					92	Nutrient Management (590)	$7.50	$690.00
					92	Cover Crop (340)	$20.00	$1,840.00
94	2	100.7	100.7	Conservation Cover (327)	100.7	Cover Crop (340)	$20.00	$2,014.00
			100.7	Conservation Crop Rotation (328)	1950	Riparian Forested Buffer (391)	$0.55	$1,072.50
			100.7	Contour Farming (330)	1950	Riparian Herbaceous Cover (390)	$0.35	$682.50
			100.7	Nutrient Management (590)	1950	Fence (382)	$1.50	$2,925.00
			100.7	Residue Management, Mulch Till (329)	1	Barnyard Run-off Control (357)	$20,000.00	$20,000.00
					1	Waste Management System (312)	$13,000.00	$13,000.00
95	1	126.9	42.5	Prescribed Grazing (528)	84.4	Conservation Crop Rotation (328)	$30.00	$2,532.00
			84.4	Contour Farming (330)	84.4	Cover Crop (340)	$20.00	$1,688.00
					1	Barnyard Run-off Control (357)	$20,000.00	$20,000.00

No.	Rank	Total Acres	Acres Treated	Installed BMP's and Code No.	Proposed Area Treated	Proposed BMP's	Estimated Cost	Total Cost
					1	Waste Management System (312)	$13,000.00	$13,000.00
96	3	NA	NA	None	1	Barnyard Run-off Control (357)	$20,000.00	$20,000.00
					1	Waste Management System (312)	$13,000.00	$13,000.00
					66	Conservation Crop Rotation (328)	$30.00	$1,980.00
					66	Contour Farming (330)	$7.50	$495.00
					66	Residue Management, No-Till (329A)	$30.00	$1,980.00
					66	Nutrient Management (590)	$7.50	$495.00
					66	Cover Crop (340)	$20.00	$1,320.00
97	2	93	93	Conservation Crop Rotation (328)	1	Barnyard Run-off Control (357)	$20,000.00	$20,000.00
			93	Residue Management, Seasonal (344)				
			93	Contour Farming (330)				
			93	Cover Crop (340)				
			93	Nutrient Management (590)				
			1	Waste Management System (312)				
98	3	NA	NA	None	1	Barnyard Run-off Control (357)	$20,000.00	$20,000.00
					1	Waste Management System (312)	$13,000.00	$13,000.00
					10	Conservation Crop Rotation (328)	$30.00	$300.00
					10	Contour Farming (330)	$7.50	$75.00
					10	Residue Management, No-Till (329A)	$30.00	$300.00
					10	Nutrient Management (590)	$7.50	$75.00
					10	Cover Crop (340)	$20.00	$200.00
99	2	39.4	39.4	Conservation Crop Rotation (328)	39.4	Nutrient Management (590)	$7.50	$295.50
			14	Contour Farming (330)	1	Barnyard Run-off Control (357)	$20,000.00	$20,000.00
			14	Cover Crop (340)	2075	Riparian Forested Buffer (391)	$0.55	$1,141.25
			2	Grassed Waterway (412)	2075	Riparian Herbaceous Cover (390)	$0.35	$726.25
			6	Residue Management, Mulch Till (329)	2075	Fence (382)	$1.50	$3,112.50

No.	Rank	Total Acres	Acres Treated	Installed BMP's and Code No.	Proposed Area Treated	Proposed BMP's	Estimated Cost	Total Cost
			1	Waste Management System (312)				
100	4	NA	NA	None	1	Barnyard Run-off Control (357)	$20,000.00	$20,000.00
					1	Waste Management System (312)	$13,000.00	$13,000.00
					62	Conservation Crop Rotation (328)	$30.00	$1,860.00
					62	Contour Farming (330)	$7.50	$465.00
					62	Residue Management, No-Till (329A)	$30.00	$1,860.00
					62	Nutrient Management (590)	$7.50	$465.00
					62	Cover Crop (340)	$20.00	$1,240.00
101	4	NA	NA	None	1500	Riparian Forested Buffer (391)	$0.55	$825.00
					1500	Riparian Herbaceous Cover (390)	$0.35	$525.00
					1500	Fence (382)	$1.50	$2,250.00
					1	Barnyard Run-off Control (357)	$20,000.00	$20,000.00
					1	Waste Management System (312)	$13,000.00	$13,000.00
					39	Conservation Crop Rotation (328)	$30.00	$1,170.00
					39	Contour Farming (330)	$7.50	$292.50
					39	Residue Management, No-Till (329A)	$30.00	$1,170.00
					39	Nutrient Management (590)	$7.50	$292.50
					39	Cover Crop (340)	$20.00	$780.00
102	4	NA	NA	None	2800	Riparian Forested Buffer (391)	$0.55	$1,540.00
					2800	Riparian Herbaceous Cover (390)	$0.35	$980.00
					2800	Fence (382)	$1.50	$4,200.00
					1	Barnyard Run-off Control (357)	$20,000.00	$20,000.00
					1	Waste Management System (312)	$13,000.00	$13,000.00
					71	Conservation Crop Rotation (328)	$30.00	$2,130.00
					71	Contour Farming (330)	$7.50	$532.50
					71	Residue Management, No-Till	$30.00	$2,130.00

No.	Rank	Total Acres	Acres Treated	Installed BMP's and Code No.	Proposed Area Treated	Proposed BMP's	Estimated Cost	Total Cost
						(329A)		
					71	Nutrient Management (590)	$7.50	$532.50
					71	Cover Crop (340)	$20.00	$1,420.00
103	4	44.8	44.8	Conservation Crop Rotation (328)	44.8	Residue Management, No-Till (329A)	$30.00	$1,344.00
			44.8	Contour Farming (330)	750	Riparian Forested Buffer (391)	$0.55	$412.50
			44.8	Cover Crop (340)	750	Riparian Herbaceous Cover (390)	$0.35	$262.50
			44.8	Nutrient Management (590)	750	Fence (382)	$1.50	$1,125.00
			3.7	Prescribed Grazing (528)	1	Barnyard Run-off Control (357)	$20,000.00	$20,000.00
					1	Waste Management System (312)	$13,000.00	$13,000.00
104	1	158	158	Conservation Crop Rotation (328)	800	Riparian Forested Buffer (391)	$0.55	$440.00
			158	Contour Buffer Strips (332)	800	Riparian Herbaceous Cover (390)	$0.35	$280.00
			116	Contour Farming (330)	800	Fence (382)	$1.50	$1,200.00
			158	Nutrient Management (590)	1	Barnyard Run-off Control (357)	$20,000.00	$20,000.00
			158	Residue Management, Mulch Till (329)	1	Waste Management System (312)	$13,000.00	$13,000.00
105	2	65.3	65.3	Conservation Crop Rotation (328)	65.3	Residue Management, No-Till (329A)	$30.00	$1,959.00
			65.3	Contour Farming (330)	2000	Riparian Forested Buffer (391)	$0.55	$1,100.00
			65.3	Cover Crop (340)	2000	Riparian Herbaceous Cover (390)	$0.35	$700.00
			65.3	Nutrient Management (590)	2000	Fence (382)	$1.50	$3,000.00
					1	Barnyard Run-off Control (357)	$20,000.00	$20,000.00
					1	Waste Management System (312)	$13,000.00	$13,000.00
106	2	74.7	74.7	Conservation Crop Rotation (328)	1	Barnyard Run-off Control (357)	$20,000.00	$20,000.00
			74.7	Contour Farming (330)	1	Waste Management System (312)	$13,000.00	$13,000.00
			74.7	Cover Crop (340)	74.7	Residue Management, No-Till (329A)	$30.00	$2,241.00
			74.7	Nutrient Management (590)				
107	3	NA	NA	None	1	Barnyard Run-off Control (357)	$20,000.00	$20,000.00

No.	Rank	Total Acres	Acres Treated	Installed BMP's and Code No.	Proposed Area Treated	Proposed BMP's	Estimated Cost	Total Cost
					1	Waste Management System (312)	$13,000.00	$13,000.00
					51	Conservation Crop Rotation (328)	$30.00	$1,530.00
					51	Contour Farming (330)	$7.50	$382.50
					51	Residue Management, No-Till (329A)	$30.00	$1,530.00
					51	Nutrient Management (590)	$7.50	$382.50
					51	Cover Crop (340)	$20.00	$1,020.00
108	3	NA	NA	None	1	Barnyard Run-off Control (357)	$20,000.00	$20,000.00
					1	Waste Management System (312)	$13,000.00	$13,000.00
					20	Conservation Crop Rotation (328)	$30.00	$600.00
					20	Contour Farming (330)	$7.50	$150.00
					20	Residue Management, No-Till (329A)	$30.00	$600.00
					20	Nutrient Management (590)	$7.50	$150.00
					20	Cover Crop (340)	$20.00	$400.00
109	3	NA	NA	None	1	Barnyard Run-off Control (357)	$20,000.00	$20,000.00
					1	Waste Management System (312)	$13,000.00	$13,000.00
					10	Conservation Crop Rotation (328)	$30.00	$300.00
					10	Contour Farming (330)	$7.50	$75.00
					10	Residue Management, No-Till (329A)	$30.00	$300.00
					10	Nutrient Management (590)	$7.50	$75.00
					10	Cover Crop (340)	$20.00	$200.00
110	3	18.6	18.6	Conservation Crop Rotation (328)	18.6	Nutrient Management (590)	$7.50	$139.50
			18.6	Contour Farming (330)	1	Barnyard Run-off Control (357)	$20,000.00	$20,000.00
			18.6	Residue Management, Mulch Till (329)	1	Waste Management System (312)	$13,000.00	$13,000.00
			4.6	Residue Management, Seasonal (344)				
			4.6	Cover Crop (340)				

No.	Rank	Total Acres	Acres Treated	Installed BMP's and Code No.	Proposed Area Treated	Proposed BMP's	Estimated Cost	Total Cost
111	4	NA	NA	None	475	Riparian Forested Buffer (391)	$0.55	$261.25
					475	Riparian Herbaceous Cover (390)	$0.35	$166.25
					475	Fence (382)	$1.50	$712.50
					1	Barnyard Run-off Control (357)	$20,000.00	$20,000.00
					1	Waste Management System (312)	$13,000.00	$13,000.00
					52	Conservation Crop Rotation (328)	$30.00	$1,560.00
					52	Contour Farming (330)	$7.50	$390.00
					52	Residue Management, No-Till (329A)	$30.00	$1,560.00
					52	Nutrient Management (590)	$7.50	$390.00
					52	Cover Crop (340)	$20.00	$1,040.00
112	1	37.1	37.1	Conservation Crop Rotation (328)	37.1	Cover Crop (340)	$20.00	$742.00
			37.1	Contour Farming (330)	2350	Riparian Forested Buffer (391)	$0.55	$1,292.50
			37.1	Nutrient Management (590)	2350	Riparian Herbaceous Cover (390)	$0.35	$822.50
			37.1	Residue Management, Mulch Till (329)	2350	Fence (382)	$1.50	$3,525.00
					1	Barnyard Run-off Control (357)	$20,000.00	$20,000.00
					1	Waste Management System (312)	$13,000.00	$13,000.00
113	2	107.2	48.6	Conservation Cover (327)	107.2	Residue Management, No-Till (329A)	$30.00	$3,216.00
			107.2	Conservation Crop Rotation (328)	675	Riparian Forested Buffer (391)	$0.55	$371.25
			107.2	Contour Farming (330)	675	Riparian Herbaceous Cover (390)	$0.35	$236.25
			107.2	Nutrient Management (590)	675	Fence (382)	$1.50	$1,012.50
			1	Waste Management System (312)	1	Barnyard Run-off Control (357)	$20,000.00	$20,000.00
114	2	NA	NA	None	1	Barnyard Run-off Control (357)	$20,000.00	$20,000.00
					1	Waste Management System (312)	$13,000.00	$13,000.00
					10	Conservation Crop Rotation (328)	$30.00	$300.00
					10	Contour Farming (330)	$7.50	$75.00
					10	Residue Management, No-Till	$30.00	$300.00

No.	Rank	Total Acres	Acres Treated	Installed BMP's and Code No.	Proposed Area Treated	Proposed BMP's	Estimated Cost	Total Cost
						(329A)		
					10	Nutrient Management (590)	$7.50	$75.00
					10	Cover Crop (340)	$20.00	$200.00
115	2	NA	NA	None	2700	Riparian Forested Buffer (391)	$0.55	$1,485.00
					2700	Riparian Herbaceous Cover (390)	$0.35	$945.00
					2700	Fence (382)	$1.50	$4,050.00
					1	Barnyard Run-off Control (357)	$20,000.00	$20,000.00
					1	Waste Management System (312)	$13,000.00	$13,000.00
					70	Conservation Crop Rotation (328)	$30.00	$2,100.00
					70	Contour Farming (330)	$7.50	$525.00
					70	Residue Management, No-Till (329A)	$30.00	$2,100.00
					70	Nutrient Management (590)	$7.50	$525.00
					70	Cover Crop (340)	$20.00	$1,400.00
116	2	84.3	84.3	Conservation Crop Rotation (328)	84.3	Nutrient Management (590)	$7.50	$632.25
			84.3	Contour Farming (330)	84.3	Cover Crop (340)	$20.00	$1,686.00
			6.1	Residue Management, Mulch Till (329)	2200	Riparian Forested Buffer (391)	$0.55	$1,210.00
					2200	Riparian Herbaceous Cover (390)	$0.35	$770.00
					2200	Fence (382)	$1.50	$3,300.00
					1	Barnyard Run-off Control (357)	$20,000.00	$20,000.00
					1	Waste Management System (312)	$13,000.00	$13,000.00
117	2	18	18	Conservation Crop Rotation (328)	18	Nutrient Management (590)	$7.50	$135.00
			18	Contour Farming (330)	18	Cover Crop (340)	$20.00	$360.00
					1	Barnyard Run-off Control (357)		$0.00
					1	Waste Management System (312)	$13,000.00	$13,000.00
118	3	NA	NA	None	1	Barnyard Run-off Control (357)	$20,000.00	$20,000.00
					1	Waste Management System (312)	$13,000.00	$13,000.00
					6	Conservation Crop Rotation (328)	$30.00	$180.00

No.	Rank	Total Acres	Acres Treated	Installed BMP's and Code No.	Proposed Area Treated	Proposed BMP's	Estimated Cost	Total Cost
					6	Contour Farming (330)	$7.50	$45.00
					6	Residue Management, No-Till (329A)	$30.00	$180.00
					6	Nutrient Management (590)	$7.50	$45.00
					6	Cover Crop (340)	$20.00	$120.00
119	1	1	1	Barnyard Runoff Control (357)	1	Waste Management System (312)	$13,000.00	$13,000.00
					45	Conservation Crop Rotation (328)	$30.00	$1,350.00
					45	Contour Farming (330)	$7.50	$337.50
					45	Residue Management, No-Till (329A)	$30.00	$1,350.00
					45	Nutrient Management (590)	$7.50	$337.50
					45	Cover Crop (340)	$20.00	$900.00
					975	Riparian Forested Buffer (391)	$0.55	$536.25
					975	Riparian Herbaceous Cover (390)	$0.35	$341.25
					975	Fence (382)	$1.50	$1,462.50
120	2	4	4	Conservation Crop Rotation (328)	600	Riparian Forested Buffer (391)	$0.55	$330.00
			4	Contour Farming (330)	600	Riparian Herbaceous Cover (390)	$0.35	$210.00
			4	Residue Management, Mulch Till (329)	600	Fence (382)	$1.50	$900.00
			1	Barnyard Run-off Control (357)	1	Waste Management System (312)	$13,000.00	$13,000.00
					39	Nutrient Management (590)	$7.50	$292.50
					39	Cover Crop (340)	$20.00	$780.00
					39	Residue Management, No-Till (329A)	$30.00	$1,170.00
121	2	NA	NA	None	1	Barnyard Run-off Control (357)	$20,000.00	$20,000.00
					1	Waste Management System (312)	$13,000.00	$13,000.00
					37	Conservation Crop Rotation (328)	$30.00	$1,110.00
					37	Contour Farming (330)	$7.50	$277.50
					37	Residue Management, No-Till (329A)	$30.00	$1,110.00

No.	Rank	Total Acres	Acres Treated	Installed BMP's and Code No.	Proposed Area Treated	Proposed BMP's	Estimated Cost	Total Cost
					37	Nutrient Management (590)	$7.50	$277.50
					37	Cover Crop (340)	$20.00	$740.00
122	3	NA	NA	None	51	Conservation Crop Rotation (328)	$30.00	$1,530.00
					51	Contour Farming (330)	$7.50	$382.50
					51	Residue Management, No-Till (329A)	$30.00	$1,530.00
					51	Nutrient Management (590)	$7.50	$382.50
					51	Cover Crop (340)	$20.00	$1,020.00
					1	Barnyard Run-off Control (357)	$20,000.00	$20,000.00
					1	Waste Management System (312)	$13,000.00	$13,000.00
					2000	Riparian Forested Buffer (391)	$0.55	$1,100.00
					2000	Riparian Herbaceous Cover (390)	$0.35	$700.00
					2000	Fence (382)	$1.50	$3,000.00
123	3	61.6	61.6	Conservation Crop Rotation (328)	1	Barnyard Run-off Control (357)	$20,000.00	$20,000.00
			61.6	Contour Farming (330)	1	Waste Management System (312)	$13,000.00	$13,000.00
			61.6	Cover Crop (340)	950	Riparian Forested Buffer (391)	$0.55	$522.50
			61.6	Nutrient Management (590)	950	Riparian Herbaceous Cover (390)	$0.35	$332.50
			61.6	Residue Management, Mulch Till (329)	1000	Fence (382)	$1.50	$1,500.00
			1	Waste Management System (312)				
124	3	NA	NA	None	50	Conservation Crop Rotation (328)	$30.00	$1,500.00
					50	Contour Farming (330)	$7.50	$375.00
					50	Residue Management, No-Till (329A)	$30.00	$1,500.00
					50	Nutrient Management (590)	$7.50	$375.00
					50	Cover Crop (340)	$20.00	$1,000.00
					1	Barnyard Run-off Control (357)	$20,000.00	$20,000.00
					1	Waste Management System (312)	$13,000.00	$13,000.00
					700	Riparian Forested Buffer (391)	$0.55	$385.00

No.	Rank	Total Acres	Acres Treated	Installed BMP's and Code No.	Proposed Area Treated	Proposed BMP's	Estimated Cost	Total Cost
					700	Riparian Herbaceous Cover (390)	$0.35	$245.00
					700	Fence (382)	$1.50	$1,050.00
125	3	NA	NA	None	48	Conservation Crop Rotation (328)	$30.00	$1,440.00
					48	Contour Farming (330)	$7.50	$360.00
					48	Residue Management, No-Till (329A)	$30.00	$1,440.00
					48	Nutrient Management (590)	$7.50	$360.00
					48	Cover Crop (340)	$20.00	$960.00
					1	Barnyard Run-off Control (357)	$20,000.00	$20,000.00
					1	Waste Management System (312)	$13,000.00	$13,000.00
					2200	Riparian Forested Buffer (391)	$0.55	$1,210.00
					2200	Riparian Herbaceous Cover (390)	$0.35	$770.00
					2200	Fence (382)	$1.50	$3,300.00
126	3	71.9	71.9	Conservation Crop Rotation (328)	1	Barnyard Run-off Control (357)	$20,000.00	$20,000.00
			71.9	Contour Farming (330)	1	Waste Management System (312)	$13,000.00	$13,000.00
			68.9	Cover Crop (340)	1350	Riparian Forested Buffer (391)	$0.55	$742.50
			71.9	Nutrient Management (590)	1350	Riparian Herbaceous Cover (390)	$0.35	$472.50
			71.9	Residue Management, Mulch Till (329)	1350	Fence (382)	$1.50	$2,025.00
					1000	Stream Channel Stabilization (584)	$25.00	$25,000.00
127	5	NA	NA	None	101	Conservation Crop Rotation (328)	$30.00	$3,030.00
					101	Contour Farming (330)	$7.50	$757.50
					101	Residue Management, No-Till (329A)	$30.00	$3,030.00
					101	Nutrient Management (590)	$7.50	$757.50
					101	Cover Crop (340)	$20.00	$2,020.00
					1	Barnyard Run-off Control (357)	$20,000.00	$20,000.00
					1	Waste Management System (312)	$13,000.00	$13,000.00
128	3	NA	NA	None	1300	Riparian Forested Buffer (391)	$0.55	$715.00

No.	Rank	Total Acres	Acres Treated	Installed BMP's and Code No.	Proposed Area Treated	Proposed BMP's	Estimated Cost	Total Cost
					1300	Riparian Herbaceous Cover (390)	$0.35	$455.00
					1300	Fence (382)	$1.50	$1,950.00
					59	Conservation Crop Rotation (328)	$30.00	$1,770.00
					59	Contour Farming (330)	$7.50	$442.50
					59	Residue Management, No-Till (329A)	$30.00	$1,770.00
					59	Nutrient Management (590)	$7.50	$442.50
					59	Cover Crop (340)	$20.00	$1,180.00
					1	Barnyard Run-off Control (357)	$20,000.00	$20,000.00
					1	Waste Management System (312)	$13,000.00	$13,000.00
129	3	NA	NA	None	9	Conservation Crop Rotation (328)	$30.00	$270.00
					9	Contour Farming (330)	$7.50	$67.50
					9	Residue Management, No-Till (329A)	$30.00	$270.00
					9	Nutrient Management (590)	$7.50	$67.50
					9	Cover Crop (340)	$20.00	$180.00
					1	Barnyard Run-off Control (357)	$20,000.00	$20,000.00
					1	Waste Management System (312)	$13,000.00	$13,000.00
130	3	NA	NA	None	35	Conservation Crop Rotation (328)	$30.00	$1,050.00
					35	Contour Farming (330)	$7.50	$262.50
					35	Residue Management, No-Till (329A)	$30.00	$1,050.00
					35	Nutrient Management (590)	$7.50	$262.50
					35	Cover Crop (340)	$20.00	$700.00
					1	Barnyard Run-off Control (357)	$20,000.00	$20,000.00
					1	Waste Management System (312)	$13,000.00	$13,000.00
131	2	118.1	26.1	Prescribed Grazing (528)	92	Cover Crop (340)	$20.00	$1,840.00
			92	Conservation Crop Rotation (328)	1	Barnyard Run-off Control (357)	$20,000.00	$20,000.00

No.	Rank	Total Acres	Acres Treated	Installed BMP's and Code No.	Proposed Area Treated	Proposed BMP's	Estimated Cost	Total Cost
			92	Contour Farming (330)	1	Waste Management System (312)	$13,000.00	$13,000.00
			92	Nutrient Management (590)	850	Riparian Forested Buffer (391)	$0.55	$467.50
			92	Residue Management, Mulch Till (329)	850	Riparian Herbaceous Cover (390)	$0.35	$297.50
					850	Fence (382)	$1.50	$1,275.00
132	3	NA	NA	None	29	Conservation Crop Rotation (328)	$30.00	$870.00
					29	Contour Farming (330)	$7.50	$217.50
					29	Nutrient Management (590)	$7.50	$217.50
					29	Residue Management, No-Till (329A)	$30.00	$870.00
					29	Cover Crop (340)	$20.00	$580.00
					1	Barnyard Run-off Control (357)	$20,000.00	$20,000.00
					1	Waste Management System (312)	$13,000.00	$13,000.00
					825	Riparian Forested Buffer (391)	$0.55	$453.75
					825	Riparian Herbaceous Cover (390)	$0.35	$288.75
					825	Fence (382)	$1.50	$1,237.50
133	3	NA	NA	None	54	Conservation Crop Rotation (328)	$30.00	$1,620.00
					54	Contour Farming (330)	$7.50	$405.00
					54	Nutrient Management (590)	$7.50	$405.00
					54	Residue Management, No-Till (329A)	$30.00	$1,620.00
					54	Cover Crop (340)	$20.00	$1,080.00
					1	Barnyard Run-off Control (357)	$20,000.00	$20,000.00
					1	Waste Management System (312)	$13,000.00	$13,000.00
134	2	64	64	Conservation Crop Rotation (328)	64	Nutrient Management (590)	$7.50	$480.00
			53.7	Contour Farming (330)	64	Cover Crop (340)	$20.00	$1,280.00
			10.3	Contour Buffer Strips (332)	1	Barnyard Run-off Control (357)	$20,000.00	$20,000.00
			64	Residue Management, Mulch Till (329)	1	Waste Management System (312)	$13,000.00	$13,000.00
					1475	Riparian Forested Buffer (391)	$0.55	$811.25

No.	Rank	Total Acres	Acres Treated	Installed BMP's and Code No.	Proposed Area Treated	Proposed BMP's	Estimated Cost	Total Cost
					1475	Riparian Herbaceous Cover (390)	$0.35	$516.25
					1475	Fence (382)	$1.50	$2,212.50
135	3	NA	NA	None	73	Conservation Crop Rotation (328)	$30.00	$2,190.00
					73	Contour Farming (330)	$7.50	$547.50
					73	Nutrient Management (590)	$7.50	$547.50
					73	Residue Management, No-Till (329A)	$30.00	$2,190.00
					73	Cover Crop (340)	$20.00	$1,460.00
					1	Barnyard Run-off Control (357)	$20,000.00	$20,000.00
					1	Waste Management System (312)	$13,000.00	$13,000.00
					3850	Riparian Forested Buffer (391)	$0.55	$2,117.50
					3850	Riparian Herbaceous Cover (390)	$0.35	$1,347.50
					3850	Fence (382)	$1.50	$5,775.00
136	3	NA	NA	None	89	Conservation Crop Rotation (328)	$30.00	$2,670.00
					89	Contour Farming (330)	$7.50	$667.50
					89	Nutrient Management (590)	$7.50	$667.50
					89	Residue Management, No-Till (329A)	$30.00	$2,670.00
					89	Cover Crop (340)	$20.00	$1,780.00
					1	Barnyard Run-off Control (357)	$20,000.00	$20,000.00
					1	Waste Management System (312)	$13,000.00	$13,000.00
137	3	NA	NA	None	57	Conservation Crop Rotation (328)	$30.00	$1,710.00
					57	Contour Farming (330)	$7.50	$427.50
					57	Nutrient Management (590)	$7.50	$427.50
					57	Residue Management, No-Till (329A)	$30.00	$1,710.00
					57	Cover Crop (340)	$20.00	$1,140.00
					1	Barnyard Run-off Control (357)	$20,000.00	$20,000.00

No.	Rank	Total Acres	Acres Treated	Installed BMP's and Code No.	Proposed Area Treated	Proposed BMP's	Estimated Cost	Total Cost
					1	Waste Management System (312)	$13,000.00	$13,000.00
138	1	90	72.2	Conservation Crop Rotation (328)	1	Barnyard Run-off Control (357)	$20,000.00	$20,000.00
			72.2	Contour Farming (330)	1550	Riparian Forested Buffer (391)	$0.55	$852.50
			72.2	Cover Crop (340)	1550	Riparian Herbaceous Cover (390)	$0.35	$542.50
			72.2	Residue Management, Seasonal (344)				
			0.7	Grassed Waterway (412)				
			72.2	Nutrient Management (590)				
			72.2	Residue Management, Mulch Till (329)				
			1	Waste Storage Facility (313)				
			1550	Fence (382)				
			17.8	Prescribed Grazing (528A)				
139	3	NA	NA	None	18	Conservation Crop Rotation (328)	$30.00	$540.00
					18	Contour Farming (330)	$7.50	$135.00
					18	Nutrient Management (590)	$7.50	$135.00
					18	Residue Management, No-Till (329A)	$30.00	$540.00
					18	Cover Crop (340)	$20.00	$360.00
					1	Barnyard Run-off Control (357)	$20,000.00	$20,000.00
					1	Waste Management System (312)	$13,000.00	$13,000.00
140	4	65.9	65.9	Conservation Crop Rotation (328)	65.9	Residue Management, No-Till (329A)	$30.00	$1,977.00
			65.9	Contour Farming (330)	65.9	Cover Crop (340)	$20.00	$1,318.00
			65.9	Nutrient Management (590)	1	Barnyard Run-off Control (357)	$20,000.00	$20,000.00
			65.9	Residue Management, Mulch Till (329)	1	Waste Management System (312)	$13,000.00	$13,000.00
141	2	66.2	66.2	Conservation Crop Rotation (328)	1650	Riparian Forested Buffer (391)	$0.55	$907.50
			66.2	Contour Farming (330)	1650	Riparian Herbaceous Cover (390)	$0.35	$577.50
			66.2	Cover Crop (340)	1650	Fence (382)	$1.50	$2,475.00
			66.2	Residue Management, Mulch Till (329)	66.2	Residue Management, No-Till	$30.00	$1,986.00

No.	Rank	Total Acres	Acres Treated	Installed BMP's and Code No.	Proposed Area Treated	Proposed BMP's	Estimated Cost	Total Cost
						(329A)		
					66.2	Nutrient Management (590)	$7.50	$496.50
						TOTAL:		$4,916,182.75*

**Total cost for annual operations and maintenance for proposed BMP's is estimated at $196,647.31 based on a total cost of $4,916,182.75 for design, construction, and installation.*

Implementation Schedule:

Farms that currently do not have any BMP's will require extensive outreach efforts on the part of the Conservation District to convince the farmers to change their practices. This will include providing educational opportunities such as workshops, field days, farm tours and seminars.

1. Projects Scheduled for 2005:

The Growing Greener riparian buffer grant at the farms of J. Irvin Zook, Lynn Neer, and Shawn Yoder will be continued through 2005. Projects at the farms of Titus Peachey, Tobe Peachey, and Ezra Zook were completed as well. Construction began on the Village Pride stream restoration project in Belleville in July 2005. After completion of the EPA 319 grant's watershed implementation plan additional construction will begin on the farms of Shawn Yoder and Dave Byler.

2. Projects Scheduled for 2006:

a) The Conservation District will be hosting an agricultural conference in February 2006. An extra effort will be made to reach out to the farmers in the Upper Kish watershed. If funding was made available, a driver could be hired to pick up Amish and drive them to the conference.

b) Proposals for 4% of farms without existing BMP's will be submitted in 2006. Implementation of these proposals, if funded, would occur in 2007.

3. Projects Scheduled for 2007:

a) If funded, educational events will continue in 2007.

b) Proposals for 8% of farms without existing BMP's will be submitted in 2007. Implementation of these proposals, if funded, would occur in 2008.

4. Projects Scheduled for 2008:

a) If funded, educational events will continue in 2008

b) Proposals for 8% of farms without existing BMP's will be submitted in 2008. Implementation of these proposals, if funded, would occur in 2009.

5. Projects Scheduled for 2009:

a) If funded, educational events will continue in 2009

b) Proposals for 8% of farms without existing BMP's will be submitted in 2009. Implementation of these proposals, if funded, would occur in 2010.

6. Other projects will continue to be scheduled until future TMDL load allocation requirements are met and as many proposed projects as possible are finished. This schedule will act as guideline for success of BMP installation, but does depend on land owner cooperation and funding sources to be successful. The Conservation District is committed to successful completion of this implementation plan and will continue to submit proposals until the goals for the watershed are met.

Model Predictions for Scheduled, Proposed, and Future Projects:

In order to correctly evaluate results from PRedICT one must first understand some of its limitations. There are two limiting factors built into PRedICT that automatically reduce the impact BMP's may have on pollutant load reductions in the watershed. The first limiting factor is the category of "Other". PRedICT incorporates sediment, nitrogen, and phosphorous from sources labeled as "Other". This is significant because BMP installation does not alter this number, which is relatively high. The calculated total sediment in May 2000 was 28,770,726 pounds; 15,300,144 pounds (53%) were from "Other" sources. This means that only 47% of the sediment load can be controlled by BMP's. Likewise, only 69% of the total nitrogen load and 49% of the total phosphorous are influenced by BMP's according to PRedICT.

The second limiting factor is that at this time PRedICT can not model every single BMP. Sufficient research has not been conducted on all of the BMP's to determine efficiency values and some BMP's affect such a small acreage as to not be included in the models. This will result in slightly lower reduction values than what are actually occurring.

Given these limitations, three scenario files were created for the Upper Kish and were run using PRedICT. The initial file included all BMP practices installed before May 2000 as "Existing" (see table 2, page 15) and all those that were actually installed between May 2000 and Spring 2005 as "Future" (see table 3, page 17). The goal was to estimate the pollution load reductions which occurred between the time PA DEP determined the area was "not attaining" (2000) and the present (2005). The results of the initial scenario showed a decline in sediment (2.3%), total nitrogen (4.4%), and phosphorous (2.8%) levels. Based on the results of the initial

scenario, more effort is needed to reduce total sediment load. Total sediment not only decreased the least between May 2000 and the current date, but also has the greatest affect on loading on the watershed in terms of pounds per year. Based on the efficiency value of each BMP, streambank stabilization, streambank fencing, wetland conversion, and conservation tillage would be the best prescribed BMP's to control sedimentation.

According to PRedICT the total cost of "Future" (Post May 2000) BMP's for this scenario was $69,588, the majority of which (93.2%) was for agricultural BMP's. Typically, the more popular BMP's had an average or below average cost estimate when compared to other BMP's. To view the report for this scenario, see Appendix C.

The second scenario also used May 2000 as the reference date, but projects currently being installed or scheduled to be implemented (see table 4, page 19) (not included in the initial scenario) were added to projects installed after May 2000 (see table 3, page 17) (included in the initial scenario) in AVNPS and PRedICT as "future" for this run. The results of this scenario showed an increased reduction over the initial scenario in all three categories. Sediment declined 2.9%- an additional .6% from the first scenario, total nitrogen declined 5.2%- an additional .8% from the first scenario, and total phosphorous declined 3.47%- an additional .67% from the first scenario. These projects, which are now either finished or in the process of being completed, led to a 2.07% overall pollution load reduction.

The addition of the scheduled BMP's increased the cost of scenario two by $194,860 above the estimated cost of the initial scenario, for a total cost of $264,448. One reason the estimated cost is more than two times the amount of the initial scenario is because one project currently being installed is a stream restoration project (Stream Channel Stabilization, BMP 584) in an urban area. This BMP has an estimated cost of $25.00/foot. To view the report for this scenario, see Appendix D.

A third scenario file was created using the current date, August 2005, as the reference date. Because the reference date was changed, all projects previously installed, being installed, or scheduled for installations were accounted for under "Existing" (see tables 2, 3, 4, pages 16-19). All BMP's proposed in Table 6 (page 22) (not included in the other two scenarios) were entered into AVNPS Tool and PRedICT as "Future". By doing this, an approximate value was found for the pollution load reductions that will occur after the installation of these projects. The

results of the third scenario showed that if all the necessary changes would and could be made, it would have significant impact on sedimentation and nutrient loading.

The results of the third scenario field showed a significant decline in sediment (19.6%), total nitrogen (24%), and phosphorous (20.4%) levels. To view results for this scenario, see Appendix E.

The one major factor inhibiting these reductions is the cost. The estimated cost for this scenario was $935,916.75. These numbers estimate that implementing both the scheduled projects (from scenario two) and proposed projects (from scenario three) would lead to a total cost of $1,130,777. However, these costs were calculated by PRedICT, which does not take all proposed BMP's into consideration. In Table 6 (page 22) all of the proposed BMP's can be seen with estimated costs. This table shows that the approximate cost to implement the proposed BMP's alone is $4,916,182.75, a significant increase over the estimation made by the modeling tool.

Stream Channel Stabilization, BMP 584, has a very high efficiency value for sediment, nitrogen, and phosphorous (.95 out of a maximum value of 1.0). The cost for this BMP is estimated at $25.00 per foot, which makes it cost prohibited in most cases, but when removed from the scenario there is very little drop in percent pollution load reduction. Based on this result, stream channel stabilization may be an important tool to be installed on farms where considerable damage to the stream has been done such as stream relocation to accommodate farming practices. Reconnecting the streams to their natural channels and flood ways and restoring meanders aids the efficiency of the stream as well as reduces pollutant loading.

Since currently a TMDL has not been established for Upper Kish Creek these reductions may or may not meet load reduction allocations. When examining other watersheds which currently have TMDL's it is difficult to find one similar in area and land use. It is also difficult to say that the exact values calculated in PRedICT from AVNPS for pounds per year are correct because they are estimates and the model has not been calibrated to the Upper Kish. This step will be done when a TMDL is written and specific loads are allocated for the watershed. Even though the exact values may not be correct, the percent reduction values should not vary greatly.

Public Information and Participation:

The major stakeholders in the Upper Kish are the English, Amish, and Mennonite farmers as well as other residents in the watershed and those who live downstream. Other important sources of information and influence include Amish Bishops, the Conservation District, Union Township Municipal Authority, Menno Township Supervisors, and the Mifflin County Mapping Department.

In an attempt to involve the whole community, surveys and meetings will be designed to inform the public of the Watershed Implementation Plan and what it entails. Particular emphasis will be placed on outreach to the Amish community because the majority of Amish farms and/or parcels do not currently have BMP's installed. To reach the Amish, the Conservation District will solicit assistance from people who know the Amish Community well for the purpose of hosting meetings intended to initiate a relationship. Over a period of years an increased trust and friendship will hopefully be made with their community through a series of meetings, field days, testimonials, events, and informational brochures. Additional importance will be placed on the trust and decision making of the local Amish Bishops, who decide what can and can not be done in the society. Progress in the Amish community is expected to be slow as seen in other documented attempts, but considering they are the majority population in the watershed and the lack of current BMP's, improvements can not be made without their support of BMP installation.

The majority of review, planning, prioritization, gaining of land owner cooperation, and securing of funding will be done by the Conservation District with additional assistance from NRCS. The Conservation District will inform the public of progress through meetings, field days and brochures or when inquiries are made at the district office. They will be open to answer any questions at public meetings, at their office, by phone, or by email which will be distributed through brochures and on surveys.

Water Quality Monitoring and Evaluation:

As mentioned previously, water quality data was collected in the watershed from 2000-2003. Additional sampling will be done periodically as time and funds permit. In order to have comparable data, sampling will be done for water chemistry and aquatic biology at historic sites

in the Upper Kish (See Figure 1, p. 3). Sampling will be done and results evaluated by the Conservation District.

Sampling Methods:

Sampling methods for future testing will use the same techniques used by the Conservation District during the Kish Assessment. The modified EPA Rapid Bioassessment Index habitat protocol score sheet will be used for habitat evaluation (Reference: EPA-5). Chemical evaluation will include stream and air temperature, dissolved oxygen, pH, conductivity, alkalinity. These will be done using a HACH chemistry kit. Nitrogen and sulfate samples will be collected at the same time, but will be sent to a PA DEP approved lab for analysis. PA DEP's "Unassessed Waters Field Form: Wadable Streams" will be used for biologic evaluation when conducting macroinvertebrate and aquatic life sampling (Reference: PA DEP-4).

Remedial Actions:

Comparison of prescribed project implementation and water quality milestones to actual results will be done in order to judge effectiveness and success of those BMP's implemented. These results will then be compared to those criteria needed to meet the CWF designation, which is the goal of this plan.

If the results show that a particular site or area of the watershed is still not meeting CWF standards, a reevaluation will be done to determine what additional actions are needed to attain the water quality standards. Suspected causes of non-attainment include inefficient BMP's or insufficient number of BMP's due to lack of land owner cooperation (particularly within the Amish community) or funding. Depending upon the results, steps may be taken to implement new BMP's, modify existing BMP's, or implement other projects to reduce sedimentation and nutrient loading. At that time additional emphasis may also be put on sewage or enrollment in the Dirt and Gravel Road Program or establishment of a similar program for private roads and farm lanes.

References:

1. Commonwealth of Pennsylvania. May 2005. 93.7 – Specific Water Quality Criteria. http://www.pacode.com/secure/data/025/chapter93/s93.7.html. Accessed July 2005.

2. Mifflin County Conservation District. Kishacoquillas Creek Watershed Assessment and Restoration Plan. pp: 3-4. June 2003.

3. Pennsylvania Department of Environmental Protection (3). January 2002. Watershed Management and TMDLs. http://www.dep.state.pa.us/dep/deputate/watermgt/wqp/wqstandards/Facts/fs2248.htm. Accessed July 2005.

4. PA Department of Environmental Protection (4). Unassessed Waters Field Form: Wadeable Streams.

5. U.S. Environmental Protection Agency (5). September 9, 2003. Rapid Bioassessment Protocols For Use in Streams and Rivers: Periphyton, Benthic, Macroinvertebrates, and Fish. http://www.epa.gov/owowwtr1/monitoring/rbp/app_a.html. Accessed July 2005.

6. U.S. Environmental Protection Agency (6). February 16, 2005. Total Maximum Daily Loads. http://www.epa.gov/owow/tmdl/intro.html. Accessed July 2005.

ATTACHMENT 'B'

UPPER KISHACOQUILLAS AGRICULTURAL COMPLIANCE PLAN

Submitted by the Mifflin County Conservation District

Watershed Background:

The Upper Kishacoquillas (or "Upper Kish") watershed is located within the municipalities of Menno and Union townships in Mifflin County and drains approximately 19,100 acres or 30 square miles of Kishacoquillas Valley, known locally as "Big Valley". The Kishacoquillas Creek (Kish Creek) watershed is not formally divided into the "Upper Kish", so for the purpose of this report The Upper Kish watershed includes the main stem of Kish Creek starting at the New Holland plant in Belleville, Little Kish Creek from the confluence with Kish Creek in Belleville to its source in White Hall, and all of the tributaries flowing into these two streams from Belleville to Allensville including the subwatersheds of King's Hollow, and Soft Run (See Figure 1: Upper Kishacoquillas Creek - Sub-watershed Boundaries). According to the State Water Plan 12A map, the Kish Creek watershed ends in Allensville. This boundary is not visually distinct, but in Allensville the direction of the flow changes so that the water flows southwest into Saddler Run.

The Upper Kish Watershed is characterized by vast agricultural land use. This is apparent by the 141 farms comprising 11,359 acres of the 19,100 acres of land, or roughly 60% of the total acreage. Because of the relatively large number of farms, sedimentation and nutrient loading through run-off have become a problem in the watershed. Amish farms comprise 7,523 acres (66%) of the agricultural acres in the watershed.

There are 58.6 miles of stream in the Upper Kish watershed. A disproportionate amount (40.9 miles or 70%) are located in agricultural areas. Soil, animal waste, and other substances enter the streams during precipitation events and also as a result of livestock having direct access to the stream. One way to address these issues has been through the development of Best Management Practices or BMP's. Some commonly prescribed BMP's include waste management systems, cover cropping, conservation tillage, stream bank fencing, and vegetative buffers

Problem Identification:

As part of DEP's Unassessed Waters Initiative, biological testing was done throughout the Upper Kish Watershed. The result was that most of the basin was placed on the 2002 303(d) Impaired Waters list for excess sediment and nutrients from agricultural sources.
A comprehensive watershed assessment conducted by the Mifflin County Conservation District from 2000 through 2003, and made possible by Growing Greener, more extensively documented chemical, biological, and habitat impairment throughout the basin. Because of intensive agricultural land use, riparian buffers are practically nonexistent.

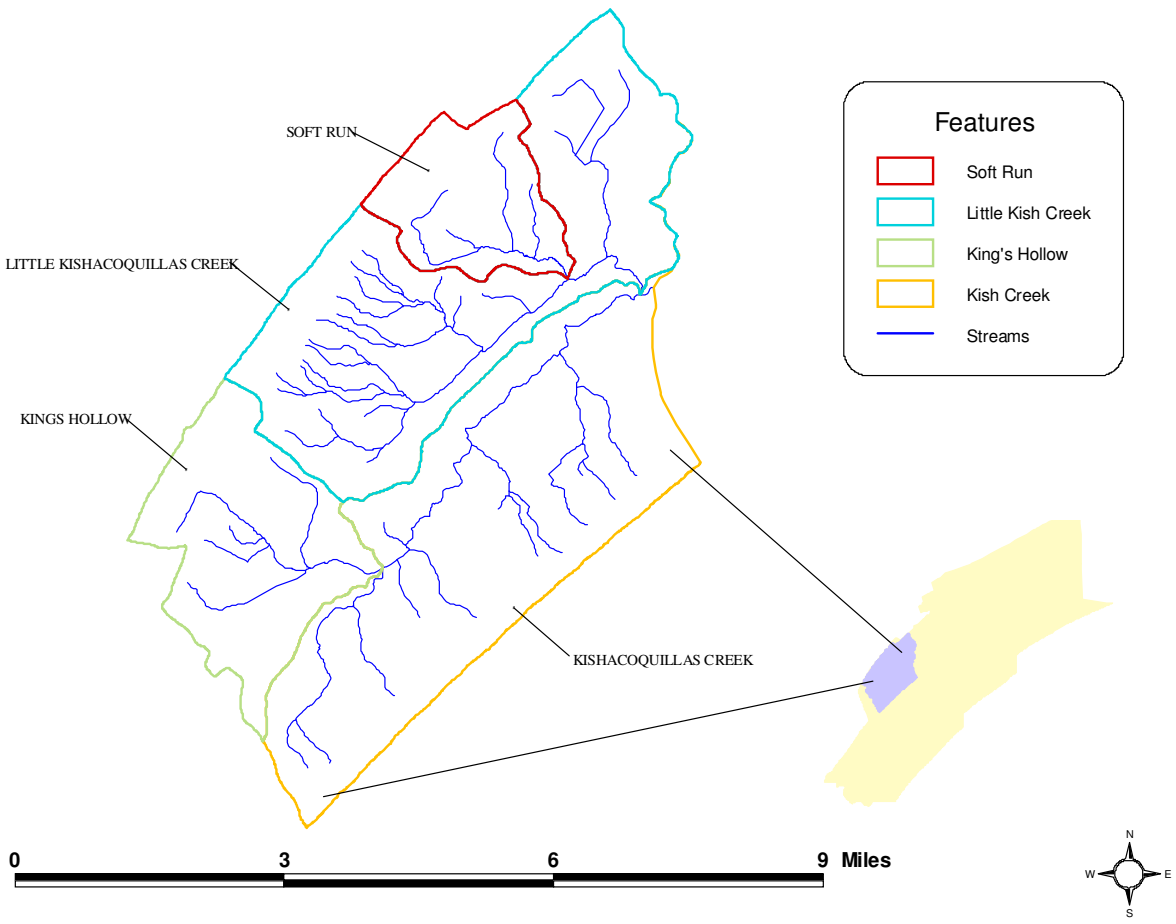


Figure 1. Upper Kish Watershed, Subwatershed Boundaries

The specific impaired subbasins are as follows:

Soft Run:

The Soft Run subwatershed is roughly 1870 acres or 2.92 square miles and is found in the north-northeast section of the Upper Kish (See Figure 1: Upper Kishacoquillas Creek - Sub-watersheds). Currently 5.8 miles of stream are listed on the PA 303 (d) list for impairment due to sedimentation and nutrient loading caused by agriculture, siltation, nutrients, and other habitat alterations.

Little Kish Creek:

The Little Kish Creek subwatershed encompasses approximately 6509 acres or 10.17 square miles of the central and northern sections of the Upper Kish watershed (See Figure 1: Upper Kishacoquillas Creek - Sub-watersheds). Currently 18.7 miles of stream are listed on the PA 303(d) list for impairment due to urban runoff, storm sewers, flow alterations, agriculture, nutrients, siltation, and other habitat alterations.

King's Hollow:

The King's Hollow subwatershed is located on the far western side of the watershed and includes 3031.53 acres or 5.16 square miles (See Figure 1: Upper Kishacoquillas Creek - Sub-watersheds). Currently 1.65 miles of stream are listed on the PA 303(d) list for impairment due to agriculture, siltation, and nutrients.

Kish Creek:

The portion of the Kish Creek watershed located in the Upper Kish watershed covers 7623.07 acres or 11.91 square miles (See Figure 1: Upper Kishacoquillas Creek - Sub-watersheds). Currently 26.5 miles of Kish Creek are listed on the PA 303 (d) list for impairment due to agriculture, siltation, nutrients, hydromodification, construction, flow variability, flow alterations, storm sewers, and urban runoff.

Sedimentation and Nutrient Loading

Because of the intensive agricultural land use in the watershed, sedimentation and nutrient loading are the primary threats to water quality. Secondary threats include sewage and unpaved roads. At this time, Total Maximum Daily Loads (TMDLs) have not been established for the Upper Kish. Primarily because of the District's previous watershed assessment and implementation planning initiatives, the establishment of TMDLs for this subbasin has been put on the fast track and can be expected to be completed by 2008.

Agricultural BMP's are designed to remedy the problems of sedimentation and nutrient loading associated with farming. The Conservation District is working with willing landowners to implement agricultural BMP's to reduce sediment and nutrient loading in the Upper Kish Watershed, with the ultimate goal of meeting the water quality standards for Cold Water Fisheries. In a primarily Amish watershed, reception to this outreach has been slow.

Currently only 71 of the 141 farms in the watershed have current conservation plans or farm plans and many of these are not as complete as the district would like. Plans incorporate the various BMP's prescribed for a given farm. In those 71 plans, 449 BMP's are prescribed to be implemented. Most plans identify multiple BMP's, which address the various aspects of farming such as row crops, hay fields, pasture, and animal feeding operations.

Ag Compliance Strategy

Because more than 2/3 of the agricultural acres in the watershed are owned by Amish farmers, this initiative is targeting, though not limiting itself to, the Plain People in the Upper Kish Watershed. The basic goals of this project are environmental compliance and ultimately improved water quality, but no initiative involving the Amish community can be successful without the consent of the church bishops. The Conservation District will meet with as many of the church elders as possible to begin a dialogue and hopefully gain their support for this effort. Once a relationship is established with the bishops, regular communication with them on compliance issues, including discussion of individual cases is essential.

The first effort towards ag compliance would involve outreach to the local ag community, particularly the Amish residents, to inform them of the Chapter 102 and 91 regulations and how they affect individual farm operations. Initially the District would publish a series of articles in the *County Observer*, a weekly newspaper with extensive circulation within the watershed, including the Amish residents. These articles would inform readers of the water quality problems present in the watershed, the environmental regulations that affect the local farming community, how farms can come into compliance, particularly with conservation planning, possible consequences of noncompliance, and opportunities for assistance from the District and its cooperating partners.

The District would also begin direct contact with watershed landowners. Those landowners willing to cooperate with the District would receive a needs assessment to determine their current level of compliance with environmental regulations. Because of the background work already completed during the development of the Upper Kish Watershed Implementation Plan (2005), the District has information on which farms have up-to-date conservation plans and which don't. This gives us a database of farms to begin targeting. The Implementation Plan also has a fairly accurate list of BMPs that have been implemented and those that are needed, based primarily on sediment and nutrient reduction goals. But the key to ag compliance will initially be the development of individual farm conservation plans, and where appropriate nutrient management plans. After farm plans are developed, BMP implementation can be investigated on a case-by-case basis.

The next step would be to organize several public meetings and field days, including one or more specifically targeting Amish producers, to discuss compliance issues and show specific conservation BMPs in use. This could include hiring a van to transport participants to some local farms to look at recently established stream buffers, Amish milkhouse waste systems (which NRCS designed and in 2 cases the District funded through a Growing Greener grant), no-till systems, and other BMPs. District personnel have also been in contact with the Octoraro Watershed Association about bringing a group of producers to that area to see some of the BMPs and watershed restoration efforts that have taken place on Amish farms. That organization has had considerable success in recent years working with Amish landowners in Lancaster County.

An important tool that the District has available is an NRCS Conservation Innovation Grant-funded project with the PSU Center for Dirt & Gravel Road Studies to do environmentally

sensitive maintenance practices on private lanes and field access roads in this same Kish Watershed, a project that is to continue through 2007. This project could bring more landowners to the District for assistance, and help us make more contacts within the local community. It will also help us address the sediment pollution concerns associated with private lanes and access roads.

One important measure of success of this initiative would be an increase in the number of acres with conservation and nutrient management plans and an increase in the number of BMPs implemented in the Upper Kish Watershed. As mentioned earlier, currently only 71 of 141 subbasin farms have up-to-date plans. A digital file of all subbasin farms, whether or not they have a conservation plan, if so the BMPs prescribed in their plans, and a farm-by-farm list of BMPs needed was already created as part of the Implementation Plan, and this would provide a system to track our success. Tangible results should be evident within one or two years.

Essential to this compliance strategy is a yet-to-be-hired Agricultural Technician on the staff of the Conservation District. Funding for this position is partially in place with the approval of ACT funding for FY 2005-06 and several other miscellaneous grants, but is still not complete. An Agricultural Compliance Initiative Special Project Grant would provide the financial resources necessary to make this position a reality. This staff person, along with our Nutrient Management Specialist, would make most of the contacts with producers in the subbasin. Because the need for conservation planning will likely increase with this initiative, it is essential that this staff person become trained and eventually certified by NRCS in developing conservation plans. Nutrient Management Planning Certification will also be necessary.

Special Project Budget (one year)

• Salaries/benefits-	$ 13,500*
• Office space rent	1,200*
• Travel	750
• Administrative	750
• Educational materials	800
Total requested	**$ 17,000**

*These represent approximately 1/3 of the total anticipated costs for this position, pro-rated to time expected to be devoted to this project.

Conservation District Board Approval

This proposal was discussed by the Mifflin County Conservation District Board on several occasions. Approval to the concept was given at the January 17, 2006 board meeting.