

# **319 Watershed Implementation Plan: Upper Kishacoquillas Creek**



**Prepared by the Mifflin County Conservation District**



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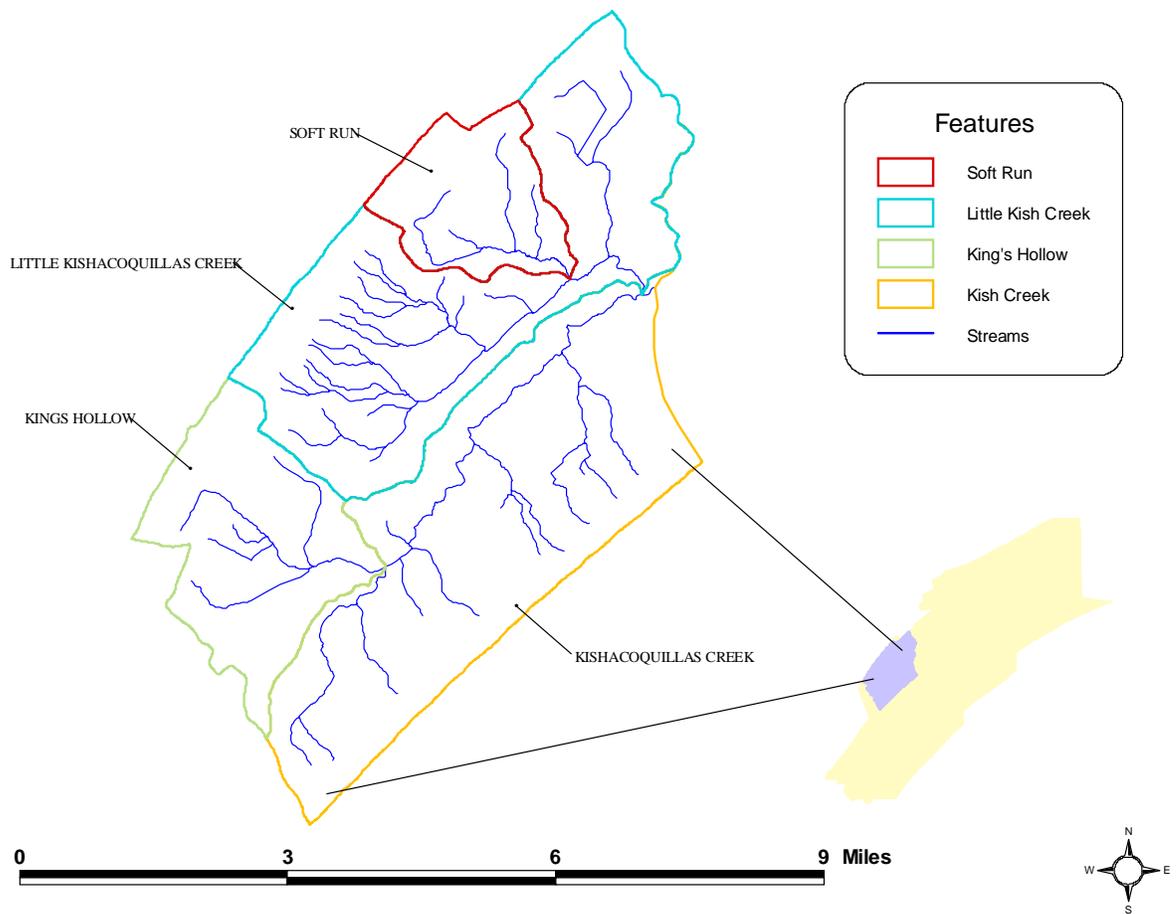
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## **Watershed Background:**

The Upper Kishacoquillas watershed or “Upper Kish” watershed is located within the municipalities of Menno and Union townships in Mifflin County and drains approximately 19,064 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 4). 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 19,064 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.



**Figure 1: Upper Kishacoquillas Watershed - Subwatershed Boundaries**

*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 (°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*

<i>Parameter</i>	<i>Criteria</i>
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 <sub>3</sub> (except where natural conditions are less)
Total Dissolved Solids (TDS)	500 mg/L as a monthly AVG value; maximum 750 mg/L

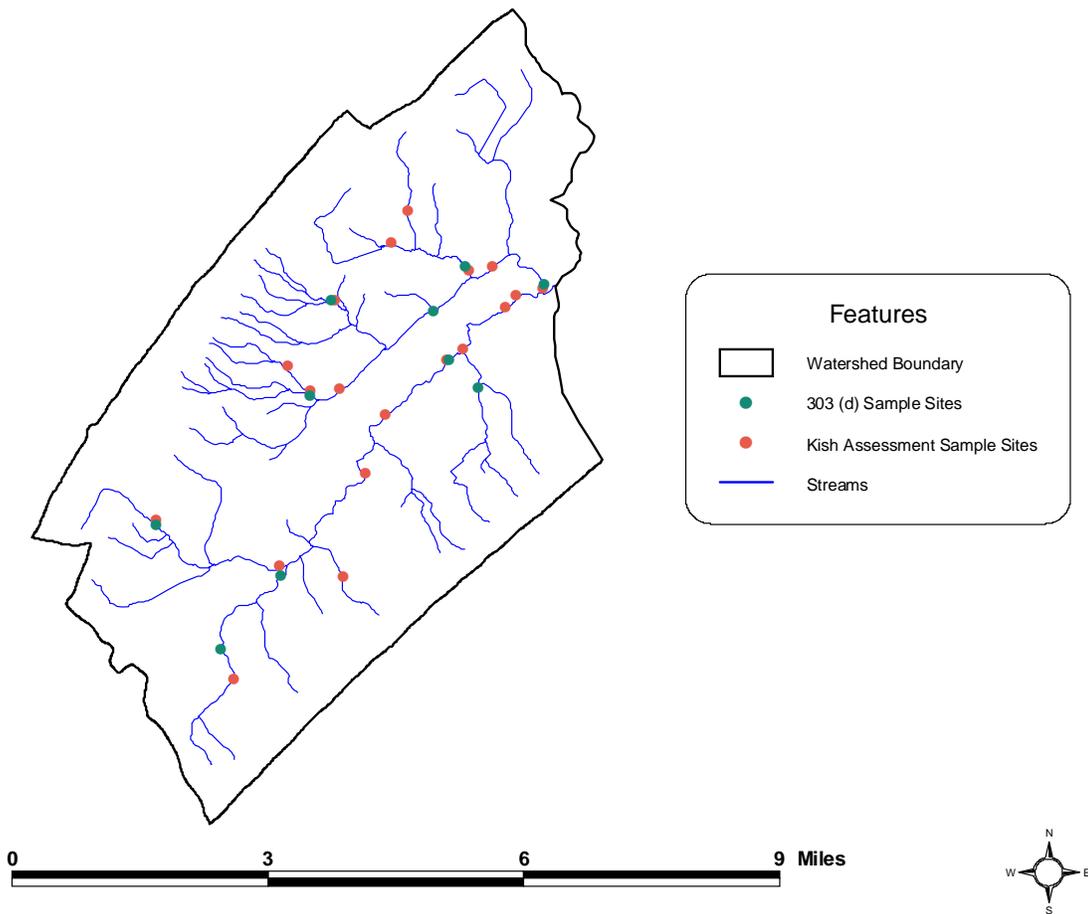
(Reference: Commonwealth of PA)

#### **Assessment of Water Quality:**

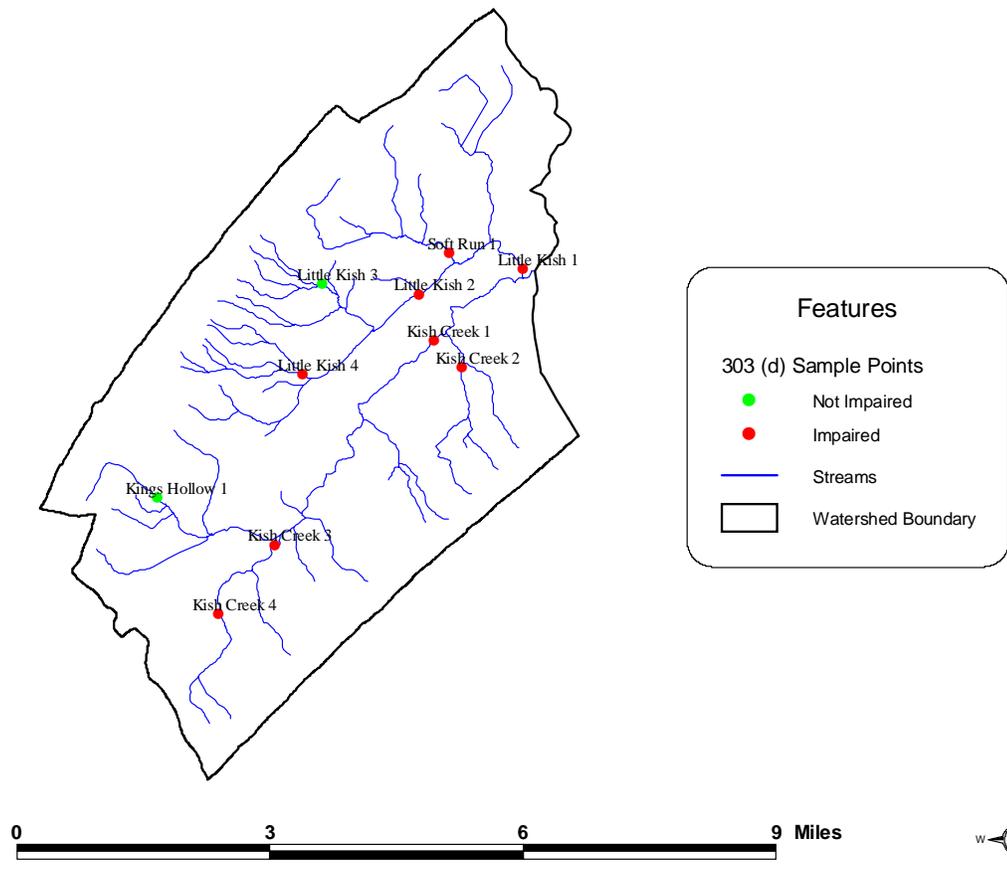
In accordance with The Clean Water Act (CWA), the primary federal law that protects our nation's waters, all states must identify and report on water quality. The Pennsylvania Department of Environmental Protection (PA DEP) conducted a statewide survey of unassessed waters to determine if the waters were meeting their Chapter 93 designated uses. In this survey the PA DEP sampled macroinvertebrates throughout the state and classified streams as either attaining the designated use, or not attaining the designated use thereby being "impaired". The sub-sheds now identified as the Upper Kish watershed was found to be "impaired" by PA DEP (see figures 3 & 4, page 9) and subsequently listed on the CWA Section 303 (d) list of impaired waters (Reference: MCCD). To view the PA DEP survey results for the sub-sheds in the Upper Kish watershed 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 assessment 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

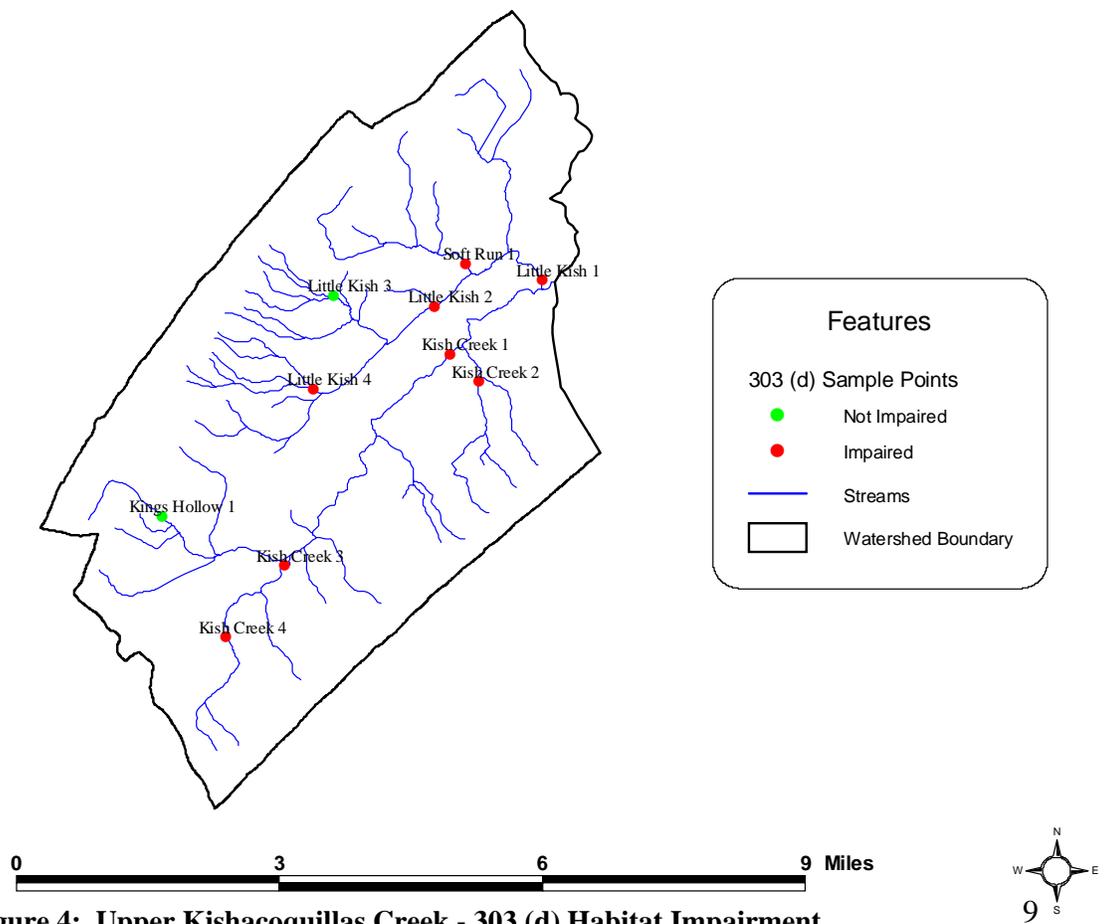
Conservation District assessment, 6 overlap with sample sites used by the PA DEP during their survey of unassessed waters (See Figure 2, Page 8). To view results from the Kish assessment for those sites that overlap with PA DEP sites see Appendix B. This data has provided an excellent framework for other 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 United States Environmental Protection Agency (EPA) and PA DEP must set guidelines and determine conditions that will return impaired waters to a status that meets the water quality standards identified in Chapter 93. To accomplish this task, water bodies that do not meet water quality standards may be assigned a total maximum daily load (TMDL), 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.

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 focuses 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 as soon as 2008. 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 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 6540 acres or 10.22 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 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 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 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.

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 Conservation 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.

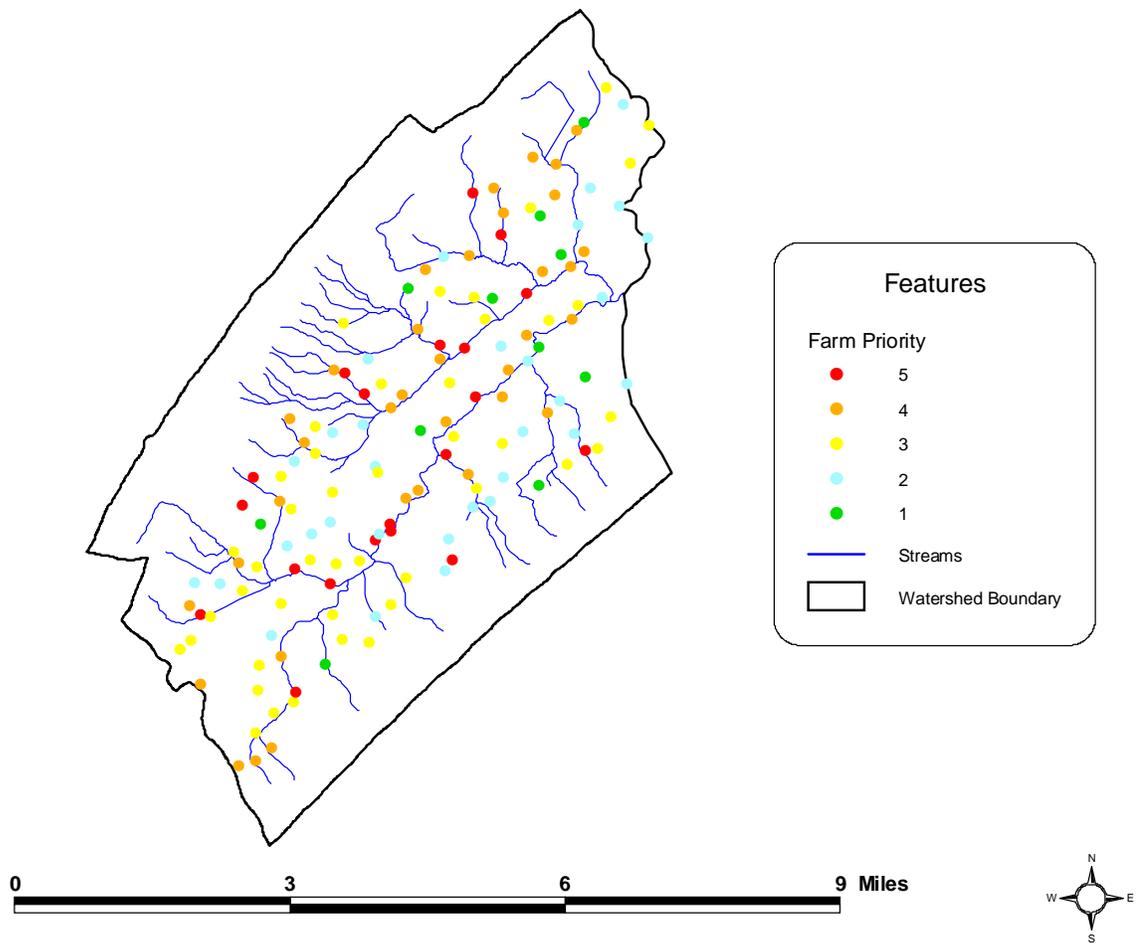
### *Water Detention Basins and Constructed Wetlands*

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 7 factors including 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. A score of one implied that the farming practices employed are not creating a significant threat to water quality, and a score of five implied that the farming practices employed are creating a very significant threat to water quality (See Figure 5, Page 15). 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. When a scenario file is modeled in PRedICT, everything before the reference date is labeled as "Existing" and everything after as "Future." 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 proposed project costs, based on current prices, which can be altered by the user as needed.

**Past Management Measures:**

Table 2 (below) shows past BMP's installed between January 1990 and May 2000 and Table 3 (page 18) shows past BMP's installed between May 2000 and December 2004.

**Table 2. Past Best Management Practices (BMP's): 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. Past Best Management Practices (BMP's): May 2000 to December 2004:**

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	---

## **Current Management Measures:**

### *Projects Recently 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 is 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 20).

**Table 4. Current BMP's to be installed in 2005-2006 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 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 21). These costs were used to estimate total costs of BMP projects in Table 6 (page 23), 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

## **Past, Current, and Proposed Projects for Implementation:**

Table 6 lists all past, 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 pollutant, 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 can not be modeled in PRedICT because efficiency values have not been determined for these practices. 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: past, current and proposed BMP's area and estimated cost**

No.	Rank	Total Acres	Acres Treated*	Installed BMP's and Code No.	Proposed Acres Treated*	Proposed BMP's	Estimated Cost per Unit	Total Cost
1	3	70	70	Conservation Crop Rotation (328)	1 (No.)	Barnyard Run-off Control (357)	\$20,000.00	\$20,000.00
			70	Contour Buffer Strips (332)	1 (No.)	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 (No.)	Barnyard Run-off Control (357)	\$20,000.00	\$20,000.00
					1 (No.)	Waste Management System (312)	\$13,000.00	\$13,000.00
					900 ft.	Riparian Forested Buffer (391)	\$0.55	\$495.00
					900 ft.	Riparian Herbaceous Cover (390)	\$0.35	\$315.00
					1375 ft.	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 (No.)	Barnyard Run-off Control (357)	\$20,000.00	\$20,000.00
					1 (No.)	Waste Management System (312)	\$13,000.00	\$13,000.00
					1200 ft.	Riparian Forested Buffer (391)	\$0.55	\$660.00
					1200 ft.	Riparian Herbaceous Cover (390)	\$0.35	\$420.00
					1800 ft.	Fence (382)	\$1.50	\$2,700.00
		1200 ft.	Stream Channel Stabilization (584)	\$25.00	\$30,000.00			

No.	Rank	Total Acres	Acres Treated*	Installed BMP's and Code No.	Proposed Acres Treated*	Proposed BMP's	Estimated Cost per Unit	Total Cost
4	3	55	1 (No.)	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 (No.)	Barnyard Run-off Control (357)	\$20,000.00	\$20,000.00
					500 ft.	Riparian Forested Buffer (391)	\$0.55	\$275.00
					500 ft.	Riparian Herbaceous Cover (390)	\$0.35	\$175.00
					500 ft.	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
				Contour Buffer Strips (332)	1 (No.)	Barnyard Run-off Control (357)	\$20,000.00	\$20,000.00
				Contour Farming (330)	1000 ft.	Fence (382)	\$1.50	\$1,500.00
				Grassed Waterway (412)	24.2	Cover Crop (340)	\$20.00	\$484.00
				Nutrient Management (590)				
			1 (No.)	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
				Contour Farming (330)	74.4	Nutrient Management (590)	\$7.50	\$558.00
				Cover Crop (340)	1 (No.)	Barnyard Run-off Control (357)	\$20,000.00	\$20,000.00
					1 (No.)	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 (329A)	\$30.00	\$2,580.00
					86	Nutrient Management (590)	\$7.50	\$645.00
					86	Cover Crop (340)	\$20.00	\$1,720.00
					1 (No.)	Barnyard Run-off Control (357)		
			1 (No.)	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

No.	Rank	Total Acres	Acres Treated*	Installed BMP's and Code No.	Proposed Acres Treated*	Proposed BMP's	Estimated Cost per Unit	Total Cost
					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 (No.)	Barnyard Run-off Control (357)	\$20,000.00	\$20,000.00
					1 (No.)	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 (No.)	Barnyard Run-off Control (357)	\$20,000.00	\$20,000.00
					1 (No.)	Waste Management System (312)	\$13,000.00	\$13,000.00
					1000 ft.	Riparian Forested Buffer (391)	\$0.55	\$550.00
					1000 ft.	Riparian Herbaceous Cover (390)	\$0.35	\$350.00
					1500 ft.	Fence (382)	\$1.50	\$2,250.00
					1000 ft.	Stream Channel Stabilization (584)	\$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 (No.)	Barnyard Run-off Control (357)		
			116	Contour Farming (330)				
			158	Nutrient Management (590)				
			158	Residue Management, Mulch Till (329)				
			1 (No.)	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 (No.)	Barnyard Run-off Control (357)	\$20,000.00	\$20,000.00
			93.1	Nutrient Management (590)	1 (No.)	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

No.	Rank	Total Acres	Acres Treated*	Installed BMP's and Code No.	Proposed Acres Treated*	Proposed BMP's	Estimated Cost per Unit	Total Cost
					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 (No.)	Barnyard Run-off Control (357)	\$20,000.00	\$20,000.00
					1 (No.)	Waste Management System (312)	\$13,000.00	\$13,000.00
					500 ft.	Riparian Forested Buffer (391)	\$0.55	\$275.00
					500 ft.	Riparian Herbaceous Cover (390)	\$0.35	\$175.00
					500 ft.	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 (No.)	Barnyard Run-off Control (357)	\$20,000.00	\$20,000.00
					1 (No.)	Waste Management System (312)	\$13,000.00	\$13,000.00
					480 ft.	Riparian Forested Buffer (391)	\$0.55	\$264.00
					480 ft.	Riparian Herbaceous Cover (390)	\$0.35	\$168.00
					480 ft.	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 (No.)	Barnyard Run-off Control (357)	\$20,000.00	\$20,000.00
					1 (No.)	Waste Management System (312)	\$13,000.00	\$13,000.00
					440 ft.	Riparian Forested Buffer (391)	\$0.55	\$242.00
					440 ft.	Riparian Herbaceous Cover (390)	\$0.35	\$154.00
					440 ft.	Fence (382)	\$1.50	\$660.00

No.	Rank	Total Acres	Acres Treated*	Installed BMP's and Code No.	Proposed Acres Treated*	Proposed BMP's	Estimated Cost per Unit	Total Cost
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 (No.)	Barnyard Run-off Control (357)	\$20,000.00	\$20,000.00
					1 (No.)	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 (No.)	Barnyard Run-off Control (357)	\$20,000.00	\$20,000.00
			91.4	Cover Crop (340)	1 (No.)	Waste Management System (312)	\$13,000.00	\$13,000.00
			1	Grassed Waterway (412)	575 ft.	Riparian Forested Buffer (391)	\$0.55	\$316.25
					575 ft.	Riparian Herbaceous Cover (390)	\$0.35	\$201.25
					575 ft.	Fence (382)	\$1.50	\$862.50
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 ft.	Riparian Forested Buffer (391)	\$0.55	\$418.00
					760 ft.	Riparian Herbaceous Cover (390)	\$0.35	\$266.00
					760 ft.	Fence (382)	\$1.50	\$1,140.00
					1 (No.)	Barnyard Run-off Control (357)	\$20,000.00	\$20,000.00
					1 (No.)	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 (No.)	Barnyard Run-off Control (357)	\$20,000.00	\$20,000.00
					1 (No.)	Waste Management System (312)	\$13,000.00	\$13,000.00

No.	Rank	Total Acres	Acres Treated*	Installed BMP's and Code No.	Proposed Acres Treated*	Proposed BMP's	Estimated Cost per Unit	Total Cost
					1000 ft.	Riparian Forested Buffer (391)	\$0.55	\$550.00
					1000 ft.	Riparian Herbaceous Cover (390)	\$0.35	\$350.00
					1500 ft.	Fence (382)	\$1.50	\$2,250.00
19	4	84.1	84.1	Conservation Crop Rotation (328)	1000 ft.	Riparian Forested Buffer (391)	\$0.55	\$550.00
			84.1	Contour Farming (330)	1000 ft.	Riparian Herbaceous Cover (390)	\$0.35	\$350.00
			84.1	Cover Crop (340)	1000 ft.	Stream Channel Stabilization (584)	\$25.00	\$25,000.00
			84.1	Nutrient Management (590)	1400 ft.	Fence (382)	\$1.50	\$2,100.00
			84.1	Residue Management, Mulch Till (329)	1 (No.)	Barnyard Run-off Control (357)	\$20,000.00	\$20,000.00
					1 (No.)	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 (329A)	\$30.00	\$1,530.00
					51	Nutrient Management (590)	\$7.50	\$382.50
					51	Cover Crop (340)	\$20.00	\$1,020.00
					1 (No.)	Barnyard Run-off Control (357)	\$20,000.00	\$20,000.00
					1 (No.)	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 (No.)	Barnyard Run-off Control (357)	\$20,000.00	\$20,000.00
			14.3	Nutrient Management (590)	1 (No.)	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 (No.)	Barnyard Run-off Control (357)	\$20,000.00	\$20,000.00
			71.5	Contour Farming (330)	1 (No.)	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 (No.)	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 ft.	Riparian Forested Buffer (391)	\$0.55	\$825.00

No.	Rank	Total Acres	Acres Treated*	Installed BMP's and Code No.	Proposed Acres Treated*	Proposed BMP's	Estimated Cost per Unit	Total Cost
			78.6	Residue Management, Mulch Till (329)	1500 ft.	Riparian Herbaceous Cover (390)	\$0.35	\$525.00
			1 (No.)	Waste Management System (312)	1900 ft.	Fence (382)	\$1.50	\$2,850.00
24	3	1	1 (No.)	Barnyard Run-off Control (357)	1400 ft.	Riparian Forested Buffer (391)	\$0.55	\$770.00
					1400 ft.	Riparian Herbaceous Cover (390)	\$0.35	\$490.00
					1500 ft.	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
					1 (No.)	Waste Management System (312)	\$13,000.00	\$13,000.00
25	3	12.3	4.4	Conservation Cover (327)	1200 ft.	Riparian Forested Buffer (391)	\$0.55	\$660.00
			12.3	Conservation Crop Rotation (328)	1200 ft.	Riparian Herbaceous Cover (390)	\$0.35	\$420.00
			7.9	Nutrient Management (590)	1300 ft.	Fence (382)	\$1.50	\$1,950.00
			7.9	Cover Crop (340)	1 (No.)	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 (No.)	Barnyard Run-off Control (357)	\$20,000.00	\$20,000.00
					1 (No.)	Waste Management System (312)	\$13,000.00	\$13,000.00
					1200 ft.	Riparian Forested Buffer (391)	\$0.55	\$660.00
					1200 ft.	Riparian Herbaceous Cover (390)	\$0.35	\$420.00
					1200 ft.	Fence (382)	\$1.50	\$1,800.00
27	5	NA	NA	None	2000 ft.	Riparian Forested Buffer (391)	\$0.55	\$1,100.00

No.	Rank	Total Acres	Acres Treated*	Installed BMP's and Code No.	Proposed Acres Treated*	Proposed BMP's	Estimated Cost per Unit	Total Cost
					2000 ft.	Riparian Herbaceous Cover (390)	\$0.35	\$700.00
					2300 ft.	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 (No.)	Barnyard Run-off Control (357)	\$20,000.00	\$20,000.00
					1 (No.)	Waste Management System (312)	\$13,000.00	\$13,000.00
28	4	1.9	1.9	Conservation Crop Rotation (328)	3200 ft.	Fence (382)	\$1.50	\$4,800.00
			1.9	Contour Farming (330)	3000 ft.	Riparian Forested Buffer (391)	\$0.55	\$1,650.00
			1.9	Residue Management, Mulch Till (329)	3000 ft.	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 (No.)	Barnyard Run-off Control (357)	\$20,000.00	\$20,000.00
					1 (No.)	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 ft.	Fence (382)	\$1.50	\$1,350.00
			11.8	Nutrient Management (590)	900 ft.	Riparian Forested Buffer (391)	\$0.55	\$495.00
			14.5	Residue Management, Mulch Till (329)	900 ft.	Riparian Herbaceous Cover (390)	\$0.35	\$315.00
					1 (No.)	Barnyard Run-off Control (357)	\$20,000.00	\$20,000.00
					1 (No.)	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 ft.	Riparian Forested Buffer (391)	\$0.55	\$770.00
			1	Grassed Waterway (412)	1400 ft.	Riparian Herbaceous Cover (390)	\$0.35	\$490.00

No.	Rank	Total Acres	Acres Treated*	Installed BMP's and Code No.	Proposed Acres Treated*	Proposed BMP's	Estimated Cost per Unit	Total Cost
			69.4	Residue Management, Mulch Till (329)	1400 ft.	Fence (382)	\$1.50	\$2,100.00
					1 (No.)	Barnyard Run-off Control (357)	\$20,000.00	\$20,000.00
					1 (No.)	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 ft.	Riparian Forested Buffer (391)	\$0.55	\$302.50
					550 ft.	Riparian Herbaceous Cover (390)	\$0.35	\$192.50
					600 ft.	Fence (382)	\$1.50	\$900.00
					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
					1 (No.)	Barnyard Run-off Control (357)	\$20,000.00	\$20,000.00
					1 (No.)	Waste Management System (312)	\$13,000.00	\$13,000.00
32	3	NA	NA	None	1 (No.)	Barnyard Run-off Control (357)	\$20,000.00	\$20,000.00
					1 (No.)	Waste Management System (312)	\$13,000.00	\$13,000.00
					500 ft.	Riparian Forested Buffer (391)	\$0.55	\$275.00
					500 ft.	Riparian Herbaceous Cover (390)	\$0.35	\$175.00
					600 ft.	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 ft.	Riparian Forested Buffer (391)	\$0.55	\$825.00
					1500 ft.	Riparian Herbaceous Cover (390)	\$0.35	\$525.00
					1600 ft.	Fence (382)	\$1.50	\$2,400.00

No.	Rank	Total Acres	Acres Treated*	Installed BMP's and Code No.	Proposed Acres Treated*	Proposed BMP's	Estimated Cost per Unit	Total Cost
					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
					1 (No.)	Barnyard Run-off Control (357)	\$20,000.00	\$20,000.00
					1 (No.)	Waste Management System (312)	\$13,000.00	\$13,000.00
34	2	84.8	1 (No.)	Barnyard Runoff Control (357)	84.8	Nutrient Management (590)	\$7.50	\$636.00
			1 (No.)	Waste Management System (312)	650 ft.	Riparian Forested Buffer (391)	\$0.55	\$357.50
			84.8	Conservation Crop Rotation (328)	650 ft.	Riparian Herbaceous Cover (390)	\$0.35	\$227.50
			84.8	Contour Farming (330)	650 ft.	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 ft.	Riparian Forested Buffer (391)	\$0.55	\$110.00
			99.2	Nutrient Management (590)	200 ft.	Riparian Herbaceous Cover (390)	\$0.35	\$70.00
			99.2	Residue Management, Mulch Till (329)	200 ft.	Fence (382)	\$1.50	\$300.00
					1 (No.)	Barnyard Run-off Control (357)	\$20,000.00	\$20,000.00
					1 (No.)	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 ft.	Riparian Forested Buffer (391)	\$0.55	\$247.50
					450 ft.	Riparian Herbaceous Cover (390)	\$0.35	\$157.50
					450 ft.	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 (No.)	Barnyard Run-off Control (357)	\$20,000.00	\$20,000.00
					1 (No.)	Waste Management System (312)	\$13,000.00	\$13,000.00

No.	Rank	Total Acres	Acres Treated*	Installed BMP's and Code No.	Proposed Acres Treated*	Proposed BMP's	Estimated Cost per Unit	Total Cost
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 (No.)	Barnyard Run-off Control (357)	\$20,000.00	\$20,000.00
			0.3	Grassed Waterway (412)	1 (No.)	Waste Management System (312)	\$13,000.00	\$13,000.00
			73	Residue Management, Mulch Till (329)	2000 ft.	Riparian Forested Buffer (391)	\$0.55	\$1,100.00
					2000 ft.	Riparian Herbaceous Cover (390)	\$0.35	\$700.00
					2100 ft.	Fence (382)	\$1.50	\$3,150.00
38	4	60.3	60.3	Conservation Crop Rotation (328)	1 (No.)	Barnyard Run-off Control (357)	\$20,000.00	\$20,000.00
			60.3	Contour Farming (330)	1 (No.)	Waste Management System (312)	\$13,000.00	\$13,000.00
			60.3	Cover Crop (340)	1700 ft.	Riparian Forested Buffer (391)	\$0.55	\$935.00
			60.3	Nutrient Management (590)	1700 ft.	Riparian Herbaceous Cover (390)	\$0.35	\$595.00
			60.3	Residue Management, Mulch Till (329)	1700 ft.	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 (No.)	Barnyard Run-off Control (357)	\$20,000.00	\$20,000.00
					1 (No.)	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 (No.)	Barnyard Run-off Control (357)	\$20,000.00	\$20,000.00
			60.7	Nutrient Management (590)	1 (No.)	Waste Management System (312)	\$13,000.00	\$13,000.00
			60.7	Residue Management, Mulch Till (329)	1500 ft.	Riparian Forested Buffer (391)	\$0.55	\$825.00
					1500 ft.	Riparian Herbaceous Cover (390)	\$0.35	\$525.00
					1500 ft.	Fence (382)	\$1.50	\$2,250.00

No.	Rank	Total Acres	Acres Treated*	Installed BMP's and Code No.	Proposed Acres Treated*	Proposed BMP's	Estimated Cost per Unit	Total Cost
41	5	NA	NA	None	65	Cover Crop (340)	\$20.00	\$1,300.00
					900 ft.	Riparian Forested Buffer (391)	\$0.55	\$495.00
					900 ft.	Riparian Herbaceous Cover (390)	\$0.35	\$315.00
					900 ft.	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 (No.)	Barnyard Run-off Control (357)	\$20,000.00	\$20,000.00
					1 (No.)	Waste Management System (312)	\$13,000.00	\$13,000.00
42	3	62.4	1 (No.)	Barnyard Runoff Control (357)	800 ft.	Riparian Forested Buffer (391)	\$0.55	\$440.00
			62.4	Conservation Crop Rotation (328)	800 ft.	Riparian Herbaceous Cover (390)	\$0.35	\$280.00
			62.4	Contour Farming (330)	800 ft.	Fence (382)	\$1.50	\$1,200.00
			62.4	Nutrient Management (590)	1 (No.)	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 (No.)	Barnyard Run-off Control (357)	\$20,000.00	\$20,000.00
			79.9	Contour Farming (330)	1900 ft.	Riparian Forested Buffer (391)	\$0.55	\$1,045.00
			79.9	Cover Crop (340)	1900 ft.	Riparian Herbaceous Cover (390)	\$0.35	\$665.00
			79.9	Nutrient Management (590)				
			79.9	Residue Management, Mulch Till (329)				
			1410 ft.	Fence (382)				
			1	Filter Strip (393)				
			0.3	Heavy Use Area Protection (561)				
			1 (No.)	Waste Management System (312)				
			1 (No.)	Roof Runoff Structure (558)				
44	2	56.1	56.1	Conservation Crop Rotation (328)	1 (No.)	Barnyard Run-off Control (357)	\$20,000.00	\$20,000.00
			56.1	Contour Farming (330)	1500 ft.	Riparian Forested Buffer (391)	\$0.55	\$825.00

No.	Rank	Total Acres	Acres Treated*	Installed BMP's and Code No.	Proposed Acres Treated*	Proposed BMP's	Estimated Cost per Unit	Total Cost
			1	Grassed Waterway (412)	1500 ft.	Riparian Herbaceous Cover (390)	\$0.35	\$525.00
			56.1	Nutrient Management (590)	56.1	Residue Management, Mulch Till (329)	\$30.00	\$1,683.00
			1 (No.)	Water and Sediment Control Basin (638)	56.1	Cover Crop (340)	\$20.00	\$1,122.00
					1500 ft.	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 ft.	Fence (382)	\$1.50	\$1,050.00
			1	Grassed Waterway (412)	700 ft.	Riparian Forested Buffer (391)	\$0.55	\$385.00
			61.1	Residue Management, Mulch Till (329)	700 ft.	Riparian Herbaceous Cover (390)	\$0.35	\$245.00
46	5	NA	NA	None	77	Cover Crop (340)	\$20.00	\$1,540.00
					700 ft.	Riparian Forested Buffer (391)	\$0.55	\$385.00
					700 ft.	Riparian Herbaceous Cover (390)	\$0.35	\$245.00
					700 ft.	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 (No.)	Barnyard Run-off Control (357)	\$20,000.00	\$20,000.00
					1 (No.)	Waste Management System (312)	\$13,000.00	\$13,000.00
47	5	NA	NA	None	1100 ft.	Riparian Forested Buffer (391)	\$0.55	\$605.00
					1100 ft.	Riparian Herbaceous Cover (390)	\$0.35	\$385.00
					1100 ft.	Fence (382)	\$1.50	\$1,650.00
					1 (No.)	Barnyard Run-off Control (357)	\$20,000.00	\$20,000.00
					1 (No.)	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
					25	Residue Management, No-Till (329A)	\$30.00	\$750.00
					25	Nutrient Management (590)	\$7.50	\$187.50

No.	Rank	Total Acres	Acres Treated*	Installed BMP's and Code No.	Proposed Acres Treated*	Proposed BMP's	Estimated Cost per Unit	Total Cost
					25	Cover Crop (340)	\$20.00	\$500.00
48	4	NA	NA	None	200 ft.	Riparian Forested Buffer (391)	\$0.55	\$110.00
					200 ft.	Riparian Herbaceous Cover (390)	\$0.35	\$70.00
					200 ft.	Fence (382)	\$1.50	\$300.00
					1 (No.)	Barnyard Run-off Control (357)	\$20,000.00	\$20,000.00
					1 (No.)	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 ft.	Riparian Forested Buffer (391)	\$0.55	\$302.50
					550 ft.	Riparian Herbaceous Cover (390)	\$0.35	\$192.50
					550 ft.	Fence (382)	\$1.50	\$825.00
					1 (No.)	Barnyard Run-off Control (357)	\$20,000.00	\$20,000.00
					1 (No.)	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 ft.	Riparian Forested Buffer (391)	\$0.55	\$440.00
					800 ft.	Riparian Herbaceous Cover (390)	\$0.35	\$280.00
					850 ft.	Fence (382)	\$1.50	\$1,275.00
					1 (No.)	Barnyard Run-off Control (357)	\$20,000.00	\$20,000.00
					1 (No.)	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

No.	Rank	Total Acres	Acres Treated*	Installed BMP's and Code No.	Proposed Acres Treated*	Proposed BMP's	Estimated Cost per Unit	Total Cost
					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 ft.	Riparian Forested Buffer (391)	\$0.55	\$1,265.00
			40.5	Cover Crop (340)	2300 ft.	Riparian Herbaceous Cover (390)	\$0.35	\$805.00
			40.5	Nutrient Management (590)	2300 ft.	Fence (382)	\$1.50	\$3,450.00
			26.1	Prescribed Grazing (528)	1 (No.)	Barnyard Run-off Control (357)	\$20,000.00	\$20,000.00
					1 (No.)	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 ft.	Riparian Forested Buffer (391)	\$0.55	\$481.25
			51.5	Cover Crop (340)	875 ft.	Riparian Herbaceous Cover (390)	\$0.35	\$306.25
			51.5	Nutrient Management (590)	875 ft.	Fence (382)	\$1.50	\$1,312.50
					1 (No.)	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 (No.)	Barnyard Run-off Control (357)	\$20,000.00	\$20,000.00
			22.8	Residue Management, Mulch Till (329)	1 (No.)	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
			0.95	Riparian Forested Buffer (391)				
			0.95	Riparian Herbaceous Cover (390)				
			1375 ft.	Fence (382)				
			1000 ft.	Stream Channel Stabilization (584)				
55	5	NA	NA	None	2200 ft.	Riparian Forested Buffer (391)	\$0.55	\$1,210.00
					2200 ft.	Riparian Herbaceous Cover (390)	\$0.35	\$770.00
					2200 ft.	Fence (382)	\$1.50	\$3,300.00
					1 (No.)	Barnyard Run-off Control (357)	\$20,000.00	\$20,000.00

No.	Rank	Total Acres	Acres Treated*	Installed BMP's and Code No.	Proposed Acres Treated*	Proposed BMP's	Estimated Cost per Unit	Total Cost
					1 (No.)	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 ft.	Riparian Forested Buffer (391)	\$0.55	\$192.50
					350 ft.	Riparian Herbaceous Cover (390)	\$0.35	\$122.50
					350 ft.	Fence (382)	\$1.50	\$525.00
					1 (No.)	Barnyard Run-off Control (357)	\$20,000.00	\$20,000.00
					1 (No.)	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 ft.	Riparian Forested Buffer (391)	\$0.55	\$1,608.75
			49.7	Contour Farming (330)	2925 ft.	Riparian Herbaceous Cover (390)	\$0.35	\$1,023.75
			49.7	Nutrient Management (590)	2925 ft.	Fence (382)	\$1.50	\$4,387.50
			49.7	Residue Management, Mulch Till (329)	1 (No.)	Barnyard Run-off Control (357)	\$20,000.00	\$20,000.00
			49.7	Cover Crop (340)	1 (No.)	Waste Management System (312)	\$13,000.00	\$13,000.00
58	4	NA	NA	None	1300 ft.	Riparian Forested Buffer (391)	\$0.55	\$715.00
					1300 ft.	Riparian Herbaceous Cover (390)	\$0.35	\$455.00
					1300 ft.	Fence (382)	\$1.50	\$1,950.00
					1 (No.)	Barnyard Run-off Control (357)	\$20,000.00	\$20,000.00
					1 (No.)	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 Acres Treated*	Proposed BMP's	Estimated Cost per Unit	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
59	1	59.8	59.8	Conservation Crop Rotation (328)	1250 ft.	Riparian Forested Buffer (391)	\$0.55	\$687.50
			59.8	Contour Farming (330)	1250 ft.	Riparian Herbaceous Cover (390)	\$0.35	\$437.50
			59.8	Cover Crop (340)	1250 ft.	Fence (382)	\$1.50	\$1,875.00
			59.8	Nutrient Management (590)				
			59.8	Residue Management, Mulch Till (329)				
			1 (No.)	Barnyard Run-off Control (357)				
			1 (No.)	Waste Management System (312)				
60	3	1	1 (No.)	Barnyard Runoff Control (357)	2800 ft.	Riparian Forested Buffer (391)	\$0.55	\$1,540.00
					2800 ft.	Riparian Herbaceous Cover (390)	\$0.35	\$980.00
					2800 ft.	Fence (382)	\$1.50	\$4,200.00
					1 (No.)	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 (329A)	\$30.00	\$1,830.00
					61	Nutrient Management (590)	\$7.50	\$457.50
					61	Cover Crop (340)	\$20.00	\$1,220.00
61	5	NA	NA	None	375 ft.	Riparian Forested Buffer (391)	\$0.55	\$206.25
					375 ft.	Riparian Herbaceous Cover (390)	\$0.35	\$131.25
					375 ft.	Fence (382)	\$1.50	\$562.50
					1 (No.)	Barnyard Run-off Control (357)	\$20,000.00	\$20,000.00
					1 (No.)	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

No.	Rank	Total Acres	Acres Treated*	Installed BMP's and Code No.	Proposed Acres Treated*	Proposed BMP's	Estimated Cost per Unit	Total Cost
					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 ft.	Riparian Forested Buffer (391)	\$0.55	\$1,320.00
			59.3	Cover Crop (340)	2400 ft.	Riparian Herbaceous Cover (390)	\$0.35	\$840.00
			59.3	Nutrient Management (590)	2400 ft.	Fence (382)	\$1.50	\$3,600.00
					1 (No.)	Barnyard Run-off Control (357)	\$20,000.00	\$20,000.00
					1 (No.)	Waste Management System (312)	\$13,000.00	\$13,000.00
63	4	NA	NA	None	975 ft.	Riparian Forested Buffer (391)	\$0.55	\$536.25
					975 ft.	Riparian Herbaceous Cover (390)	\$0.35	\$341.25
					975 ft.	Fence (382)	\$1.50	\$1,462.50
					1 (No.)	Barnyard Run-off Control (357)	\$20,000.00	\$20,000.00
					1 (No.)	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
64	5	NA	NA	None	1600 ft.	Riparian Forested Buffer (391)	\$0.55	\$880.00
					1600 ft.	Riparian Herbaceous Cover (390)	\$0.35	\$560.00
					1600 ft.	Fence (382)	\$1.50	\$2,400.00
					1 (No.)	Barnyard Run-off Control (357)	\$20,000.00	\$20,000.00
					1 (No.)	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

No.	Rank	Total Acres	Acres Treated*	Installed BMP's and Code No.	Proposed Acres Treated*	Proposed BMP's	Estimated Cost per Unit	Total Cost
			58.8	Cover Crop (340)	58.8	Contour Farming (330)	\$7.50	\$441.00
			2	Grassed Waterway (412)	2200 ft.	Riparian Forested Buffer (391)	\$0.55	\$1,210.00
			7.9	Nutrient Management (590)	2200 ft.	Riparian Herbaceous Cover (390)	\$0.35	\$770.00
			58.8	Residue Management, Mulch Till (329)	2200 ft.	Fence (382)	\$1.50	\$3,300.00
					1 (No.)	Barnyard Run-off Control (357)	\$20,000.00	\$20,000.00
					1 (No.)	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 ft.	Riparian Forested Buffer (391)	\$0.55	\$660.00
			40.1	Cover Crop (340)	1200 ft.	Riparian Herbaceous Cover (390)	\$0.35	\$420.00
			40.1	Nutrient Management (590)	1000 ft.	Stream Channel Stabilization	\$25.00	\$25,000.00
			600	Diversion (362)	1200 ft.	Fence (382)	\$1.50	\$1,800.00
			1 (No.)	Waste Management System (312)	1 (No.)	Barnyard Run-off Control (357)	\$20,000.00	\$20,000.00
67	1	1	1 (No.)	Barnyard Runoff Control (357)	1050 ft.	Riparian Forested Buffer (391)	\$0.55	\$577.50
			1 (No.)	Waste Management System (312)	1050 ft.	Riparian Herbaceous Cover (390)	\$0.35	\$367.50
					1050 ft.	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 ft.	Riparian Forested Buffer (391)	\$0.55	\$605.00
					1100 ft.	Riparian Herbaceous Cover (390)	\$0.35	\$385.00
					1100 ft.	Fence (382)	\$1.50	\$1,650.00
					1 (No.)	Barnyard Run-off Control (357)	\$20,000.00	\$20,000.00
					1 (No.)	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

No.	Rank	Total Acres	Acres Treated*	Installed BMP's and Code No.	Proposed Acres Treated*	Proposed BMP's	Estimated Cost per Unit	Total Cost
					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 (No.)	Barnyard Run-off Control (357)	\$20,000.00	\$20,000.00
			38.3	Contour Farming (330)	1 (No.)	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)				
			0.82	Riparian Herbaceous Cover (390)				
			875	Fence (382)				
70	2	51.2	1 (No.)	Waste Management System (312)	51.2	Cover Crop (340)	\$20.00	\$1,024.00
			51.2	Conservation Crop Rotation (328)	1 (No.)	Barnyard Run-off Control (357)	\$20,000.00	\$20,000.00
			51.2	Contour Farming (330)	1500 ft.	Riparian Forested Buffer (391)	\$0.55	\$825.00
			51.2	Nutrient Management (590)	1500 ft.	Riparian Herbaceous Cover (390)	\$0.35	\$525.00
			51.2	Residue Management, Mulch Till (329)	1500 ft.	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 ft.	Riparian Forested Buffer (391)	\$0.55	\$715.00
			4.2	Contour Farming (330)	1300 ft.	Riparian Herbaceous Cover (390)	\$0.35	\$455.00
			31.6	Cover Crop (340)	1300 ft.	Fence (382)	\$1.50	\$1,950.00
			27.4	Residue Management, Mulch Till (329)				
72	5	NA	NA	None	1600 ft.	Riparian Forested Buffer (391)	\$0.55	\$880.00
					1600 ft.	Riparian Herbaceous Cover (390)	\$0.35	\$560.00
					1600 ft.	Fence (382)	\$1.50	\$2,400.00
					1 (No.)	Barnyard Run-off Control (357)	\$20,000.00	\$20,000.00
					1 (No.)	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

No.	Rank	Total Acres	Acres Treated*	Installed BMP's and Code No.	Proposed Acres Treated*	Proposed BMP's	Estimated Cost per Unit	Total Cost
					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 ft.	Riparian Forested Buffer (391)	\$0.55	\$1,223.75
					2225 ft.	Riparian Herbaceous Cover (390)	\$0.35	\$778.75
					2225 ft.	Fence (382)	\$1.50	\$3,337.50
					1 (No.)	Barnyard Run-off Control (357)	\$20,000.00	\$20,000.00
					1 (No.)	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 (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 ft.	Riparian Forested Buffer (391)	\$0.55	\$1,760.00
			65.1	Contour Farming (330)	3200 ft.	Riparian Herbaceous Cover (390)	\$0.35	\$1,120.00
			65.1	Cover Crop (340)	3200 ft.	Fence (382)	\$1.50	\$4,800.00
			65.1	Nutrient Management (590)	1 (No.)	Barnyard Run-off Control (357)		\$0.00
					1 (No.)	Waste Management System (312)	\$13,000.00	\$13,000.00
75	3	NA	NA	None	1 (No.)	Barnyard Run-off Control (357)	\$20,000.00	\$20,000.00
					1 (No.)	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

No.	Rank	Total Acres	Acres Treated*	Installed BMP's and Code No.	Proposed Acres Treated*	Proposed BMP's	Estimated Cost per Unit	Total Cost
			193.5	Cover Crop (340)				
			3	Grassed Waterway (412)				
			193	Nutrient Management (590)				
			193	Residue Management, Mulch Till (329)				
			1 (No.)	Roof Runoff Structure (558)				
			1 (No.)	Water and Sediment Control Basin (638)				
77	5	NA	NA	None	1800 ft.	Riparian Forested Buffer (391)	\$0.55	\$990.00
					1800 ft.	Riparian Herbaceous Cover (390)	\$0.35	\$630.00
					1800 ft.	Fence (382)	\$1.50	\$2,700.00
					1 (No.)	Barnyard Run-off Control (357)	\$20,000.00	\$20,000.00
					1 (No.)	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 ft.	Riparian Forested Buffer (391)	\$0.55	\$1,375.00
			85.7	Cover Crop (340)	2500 ft.	Riparian Herbaceous Cover (390)	\$0.35	\$875.00
			85.7	Residue Management, Mulch Till (329)	2600 ft.	Fence (382)	\$1.50	\$3,900.00
					1 (No.)	Barnyard Run-off Control (357)	\$20,000.00	\$20,000.00
					1 (No.)	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 ft.	Riparian Forested Buffer (391)	\$0.55	\$577.50
			12.1	Nutrient Management (590)	1050 ft.	Riparian Herbaceous Cover (390)	\$0.35	\$367.50
			12.1	Residue Management, Mulch Till (329)	1050 ft.	Fence (382)	\$1.50	\$1,575.00
					1 (No.)	Barnyard Run-off Control (357)	\$20,000.00	\$20,000.00
					1 (No.)	Waste Management System (312)	\$13,000.00	\$13,000.00

No.	Rank	Total Acres	Acres Treated*	Installed BMP's and Code No.	Proposed Acres Treated*	Proposed BMP's	Estimated Cost per Unit	Total Cost
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 ft.	Riparian Forested Buffer (391)	\$0.55	\$770.00
			17.3	Cover Crop (340)	1400 ft.	Riparian Herbaceous Cover (390)	\$0.35	\$490.00
			0.21	Grassed Waterway (412)	1400 ft.	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 ft.	Riparian Forested Buffer (391)	\$0.55	\$1,347.50
					2450 ft.	Riparian Herbaceous Cover (390)	\$0.35	\$857.50
					2450 ft.	Fence (382)	\$1.50	\$3,675.00
					1 (No.)	Barnyard Run-off Control (357)	\$20,000.00	\$20,000.00
					1 (No.)	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 ft.	Riparian Forested Buffer (391)	\$0.55	\$577.50
					1050 ft.	Riparian Herbaceous Cover (390)	\$0.35	\$367.50
					1050 ft.	Fence (382)	\$1.50	\$1,575.00
					1 (No.)	Barnyard Run-off Control (357)	\$20,000.00	\$20,000.00
					1 (No.)	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 ft.	Riparian Forested Buffer (391)	\$0.55	\$1,320.00
					2400 ft.	Riparian Herbaceous Cover (390)	\$0.35	\$840.00

No.	Rank	Total Acres	Acres Treated*	Installed BMP's and Code No.	Proposed Acres Treated*	Proposed BMP's	Estimated Cost per Unit	Total Cost
					2400 ft.	Fence (382)	\$1.50	\$3,600.00
					1 (No.)	Barnyard Run-off Control (357)	\$20,000.00	\$20,000.00
					1 (No.)	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 ft.	Riparian Forested Buffer (391)	\$0.55	\$206.25
			12	Contour Farming (330)	375 ft.	Riparian Herbaceous Cover (390)	\$0.35	\$131.25
			12	Cover Crop (340)	375 ft.	Fence (382)	\$1.50	\$562.50
			12	Contour Buffer Strips (332)	1 (No.)	Barnyard Run-off Control (357)	\$20,000.00	\$20,000.00
			12	Nutrient Management (590)	1 (No.)	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 ft.	Fence (382)	\$1.50	\$1,800.00
			15.4	Contour Farming (330)	1 (No.)	Barnyard Run-off Control (357)	\$20,000.00	\$20,000.00
			7.4	Cover Crop (340)	1 (No.)	Waste Management System (312)	\$13,000.00	\$13,000.00
			7.4	Nutrient Management (590)				
			55.4	Residue Management, Mulch Till (329)				
			1200 ft.	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 ft.	Riparian Forested Buffer (391)	\$0.55	\$275.00
					500 ft.	Riparian Herbaceous Cover (390)	\$0.35	\$175.00
					500 ft.	Fence (382)	\$1.50	\$750.00
					1 (No.)	Barnyard Run-off Control (357)	\$20,000.00	\$20,000.00

No.	Rank	Total Acres	Acres Treated*	Installed BMP's and Code No.	Proposed Acres Treated*	Proposed BMP's	Estimated Cost per Unit	Total Cost
					1 (No.)	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 (No.)	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 (No.)	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 (No.)	Barnyard Run-off Control (357)	\$20,000.00	\$20,000.00
					1 (No.)	Waste Management System (312)	\$13,000.00	\$13,000.00
89	1	1	1 (No.)	Barnyard Runoff Control (357)	1375 ft.	Riparian Forested Buffer (391)	\$0.55	\$756.25
					1375 ft.	Riparian Herbaceous Cover (390)	\$0.35	\$481.25
					1375 ft.	Fence (382)	\$1.50	\$2,062.50
					1 (No.)	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
					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

No.	Rank	Total Acres	Acres Treated*	Installed BMP's and Code No.	Proposed Acres Treated*	Proposed BMP's	Estimated Cost per Unit	Total Cost
90	4	NA	NA	None	1850 ft.	Riparian Forested Buffer (391)	\$0.55	\$1,017.50
					1850 ft.	Riparian Herbaceous Cover (390)	\$0.35	\$647.50
					1000 ft.	Stream Channel Stabilization (584)	\$25.00	\$25,000.00
					1850 ft.	Fence (382)	\$1.50	\$2,775.00
					1 (No.)	Barnyard Run-off Control (357)	\$20,000.00	\$20,000.00
					1 (No.)	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	70	1 (No.)	Barnyard Runoff Control (357)	250 ft.	Riparian Forested Buffer (391)	\$0.55	\$137.50
			1 (No.)	Waste Management System (312)	250 ft.	Riparian Herbaceous Cover (390)	\$0.35	\$87.50
					250 ft.	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 ft.	Riparian Forested Buffer (391)	\$0.55	\$1,045.00
					1900 ft.	Riparian Herbaceous Cover (390)	\$0.35	\$665.00
					2100 ft.	Fence (382)	\$1.50	\$3,150.00
					1 (No.)	Barnyard Run-off Control (357)	\$20,000.00	\$20,000.00
					1 (No.)	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

No.	Rank	Total Acres	Acres Treated*	Installed BMP's and Code No.	Proposed Acres Treated*	Proposed BMP's	Estimated Cost per Unit	Total Cost
					107	Cover Crop (340)	\$20.00	\$2,140.00
93	3	NA	NA	None	2700 ft.	Riparian Forested Buffer (391)	\$0.55	\$1,485.00
					2700 ft.	Riparian Herbaceous Cover (390)	\$0.35	\$945.00
					2700 ft.	Fence (382)	\$1.50	\$4,050.00
					1 (No.)	Barnyard Run-off Control (357)	\$20,000.00	\$20,000.00
					1 (No.)	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 ft.	Riparian Forested Buffer (391)	\$0.55	\$1,072.50
			100.7	Contour Farming (330)	1950 ft.	Riparian Herbaceous Cover (390)	\$0.35	\$682.50
			100.7	Nutrient Management (590)	1950 ft.	Fence (382)	\$1.50	\$2,925.00
			100.7	Residue Management, Mulch Till (329)	1 (No.)	Barnyard Run-off Control (357)	\$20,000.00	\$20,000.00
					1 (No.)	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 (No.)	Barnyard Run-off Control (357)	\$20,000.00	\$20,000.00
					1 (No.)	Waste Management System (312)	\$13,000.00	\$13,000.00
96	3	NA	NA	None	1 (No.)	Barnyard Run-off Control (357)	\$20,000.00	\$20,000.00
					1 (No.)	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

No.	Rank	Total Acres	Acres Treated*	Installed BMP's and Code No.	Proposed Acres Treated*	Proposed BMP's	Estimated Cost per Unit	Total Cost
97	2	93	93	Conservation Crop Rotation (328)	1 (No.)	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 (No.)	Waste Management System (312)				
98	3	NA	NA	None	1 (No.)	Barnyard Run-off Control (357)	\$20,000.00	\$20,000.00
					1 (No.)	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 (No.)	Barnyard Run-off Control (357)	\$20,000.00	\$20,000.00
			14	Cover Crop (340)	2075 ft.	Riparian Forested Buffer (391)	\$0.55	\$1,141.25
			2	Grassed Waterway (412)	2075 ft.	Riparian Herbaceous Cover (390)	\$0.35	\$726.25
			6	Residue Management, Mulch Till (329)	2075 ft.	Fence (382)	\$1.50	\$3,112.50
			1 (No.)	Waste Management System (312)				
100	4	NA	NA	None	1 (No.)	Barnyard Run-off Control (357)	\$20,000.00	\$20,000.00
					1 (No.)	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 ft.	Riparian Forested Buffer (391)	\$0.55	\$825.00
					1500 ft.	Riparian Herbaceous Cover (390)	\$0.35	\$525.00

No.	Rank	Total Acres	Acres Treated*	Installed BMP's and Code No.	Proposed Acres Treated*	Proposed BMP's	Estimated Cost per Unit	Total Cost
					1500 ft.	Fence (382)	\$1.50	\$2,250.00
					1 (No.)	Barnyard Run-off Control (357)	\$20,000.00	\$20,000.00
					1 (No.)	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 ft.	Riparian Forested Buffer (391)	\$0.55	\$1,540.00
					2800 ft.	Riparian Herbaceous Cover (390)	\$0.35	\$980.00
					2800 ft.	Fence (382)	\$1.50	\$4,200.00
					1 (No.)	Barnyard Run-off Control (357)	\$20,000.00	\$20,000.00
					1 (No.)	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 (329A)	\$30.00	\$2,130.00
					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 ft.	Riparian Forested Buffer (391)	\$0.55	\$412.50
			44.8	Cover Crop (340)	750 ft.	Riparian Herbaceous Cover (390)	\$0.35	\$262.50
			44.8	Nutrient Management (590)	750 ft.	Fence (382)	\$1.50	\$1,125.00
			3.7	Prescribed Grazing (528)	1 (No.)	Barnyard Run-off Control (357)	\$20,000.00	\$20,000.00
					1 (No.)	Waste Management System (312)	\$13,000.00	\$13,000.00
104	1	158	158	Conservation Crop Rotation (328)	800 ft.	Riparian Forested Buffer (391)	\$0.55	\$440.00
			158	Contour Buffer Strips (332)	800 ft.	Riparian Herbaceous Cover (390)	\$0.35	\$280.00
			116	Contour Farming (330)	800 ft.	Fence (382)	\$1.50	\$1,200.00
			158	Nutrient Management (590)	1 (No.)	Barnyard Run-off Control (357)	\$20,000.00	\$20,000.00

No.	Rank	Total Acres	Acres Treated*	Installed BMP's and Code No.	Proposed Acres Treated*	Proposed BMP's	Estimated Cost per Unit	Total Cost
			158	Residue Management, Mulch Till (329)	1 (No.)	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 ft.	Riparian Forested Buffer (391)	\$0.55	\$1,100.00
			65.3	Cover Crop (340)	2000 ft.	Riparian Herbaceous Cover (390)	\$0.35	\$700.00
			65.3	Nutrient Management (590)	2000 ft.	Fence (382)	\$1.50	\$3,000.00
					1 (No.)	Barnyard Run-off Control (357)	\$20,000.00	\$20,000.00
					1 (No.)	Waste Management System (312)	\$13,000.00	\$13,000.00
106	2	74.7	74.7	Conservation Crop Rotation (328)	1 (No.)	Barnyard Run-off Control (357)	\$20,000.00	\$20,000.00
			74.7	Contour Farming (330)	1 (No.)	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 (No.)	Barnyard Run-off Control (357)	\$20,000.00	\$20,000.00
					1 (No.)	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 (No.)	Barnyard Run-off Control (357)	\$20,000.00	\$20,000.00
					1 (No.)	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 (No.)	Barnyard Run-off Control (357)	\$20,000.00	\$20,000.00
					1 (No.)	Waste Management System (312)	\$13,000.00	\$13,000.00
					10	Conservation Crop Rotation (328)	\$30.00	\$300.00

No.	Rank	Total Acres	Acres Treated*	Installed BMP's and Code No.	Proposed Acres Treated*	Proposed BMP's	Estimated Cost per Unit	Total Cost
					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 (No.)	Barnyard Run-off Control (357)	\$20,000.00	\$20,000.00
			18.6	Residue Management, Mulch Till (329)	1 (No.)	Waste Management System (312)	\$13,000.00	\$13,000.00
			4.6	Residue Management, Seasonal (344)				
			4.6	Cover Crop (340)				
111	4	NA	NA	None	475 ft.	Riparian Forested Buffer (391)	\$0.55	\$261.25
					475 ft.	Riparian Herbaceous Cover (390)	\$0.35	\$166.25
					475 ft.	Fence (382)	\$1.50	\$712.50
					1 (No.)	Barnyard Run-off Control (357)	\$20,000.00	\$20,000.00
					1 (No.)	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 ft.	Riparian Forested Buffer (391)	\$0.55	\$1,292.50
			37.1	Nutrient Management (590)	2350 ft.	Riparian Herbaceous Cover (390)	\$0.35	\$822.50
			37.1	Residue Management, Mulch Till (329)	2350 ft.	Fence (382)	\$1.50	\$3,525.00
					1 (No.)	Barnyard Run-off Control (357)	\$20,000.00	\$20,000.00
					1 (No.)	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

No.	Rank	Total Acres	Acres Treated*	Installed BMP's and Code No.	Proposed Acres Treated*	Proposed BMP's	Estimated Cost per Unit	Total Cost
			107.2	Nutrient Management (590)	675	Fence (382)	\$1.50	\$1,012.50
			1 (No.)	Waste Management System (312)	1 (No.)	Barnyard Run-off Control (357)	\$20,000.00	\$20,000.00
114	2	NA	NA	None	1 (No.)	Barnyard Run-off Control (357)	\$20,000.00	\$20,000.00
					1 (No.)	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
115	2	NA	NA	None	2700 ft.	Riparian Forested Buffer (391)	\$0.55	\$1,485.00
					2700 ft.	Riparian Herbaceous Cover (390)	\$0.35	\$945.00
					2700 ft.	Fence (382)	\$1.50	\$4,050.00
					1 (No.)	Barnyard Run-off Control (357)	\$20,000.00	\$20,000.00
					1 (No.)	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 ft.	Riparian Forested Buffer (391)	\$0.55	\$1,210.00
					2200 ft.	Riparian Herbaceous Cover (390)	\$0.35	\$770.00
					2200 ft.	Fence (382)	\$1.50	\$3,300.00
					1 (No.)	Barnyard Run-off Control (357)	\$20,000.00	\$20,000.00
					1 (No.)	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

No.	Rank	Total Acres	Acres Treated*	Installed BMP's and Code No.	Proposed Acres Treated*	Proposed BMP's	Estimated Cost per Unit	Total Cost
					1 (No.)	Barnyard Run-off Control (357)		\$0.00
					1 (No.)	Waste Management System (312)	\$13,000.00	\$13,000.00
118	3	NA	NA	None	1 (No.)	Barnyard Run-off Control (357)	\$20,000.00	\$20,000.00
					1 (No.)	Waste Management System (312)	\$13,000.00	\$13,000.00
					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
119	1	1	1 (No.)	Barnyard Runoff Control (357)	1 (No.)	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 ft.	Riparian Forested Buffer (391)	\$0.55	\$536.25
					975 ft.	Riparian Herbaceous Cover (390)	\$0.35	\$341.25
					975 ft.	Fence (382)	\$1.50	\$1,462.50
120	2	4	4	Conservation Crop Rotation (328)	600 ft.	Riparian Forested Buffer (391)	\$0.55	\$330.00
			4	Contour Farming (330)	600 ft.	Riparian Herbaceous Cover (390)	\$0.35	\$210.00
			4	Residue Management, Mulch Till (329)	600 ft.	Fence (382)	\$1.50	\$900.00
			1 (No.)	Barnyard Run-off Control (357)	1 (No.)	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 (No.)	Barnyard Run-off Control (357)	\$20,000.00	\$20,000.00
					1 (No.)	Waste Management System (312)	\$13,000.00	\$13,000.00
					37	Conservation Crop Rotation (328)	\$30.00	\$1,110.00

No.	Rank	Total Acres	Acres Treated*	Installed BMP's and Code No.	Proposed Acres Treated*	Proposed BMP's	Estimated Cost per Unit	Total Cost
					37	Contour Farming (330)	\$7.50	\$277.50
					37	Residue Management, No-Till (329A)	\$30.00	\$1,110.00
					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 (No.)	Barnyard Run-off Control (357)	\$20,000.00	\$20,000.00
					1 (No.)	Waste Management System (312)	\$13,000.00	\$13,000.00
					2000 ft.	Riparian Forested Buffer (391)	\$0.55	\$1,100.00
					2000 ft.	Riparian Herbaceous Cover (390)	\$0.35	\$700.00
					2000 ft.	Fence (382)	\$1.50	\$3,000.00
123	3	61.6	61.6	Conservation Crop Rotation (328)	1 (No.)	Barnyard Run-off Control (357)	\$20,000.00	\$20,000.00
			61.6	Contour Farming (330)	1 (No.)	Waste Management System (312)	\$13,000.00	\$13,000.00
			61.6	Cover Crop (340)	950 ft.	Riparian Forested Buffer (391)	\$0.55	\$522.50
			61.6	Nutrient Management (590)	950 ft.	Riparian Herbaceous Cover (390)	\$0.35	\$332.50
			61.6	Residue Management, Mulch Till (329)	1000 ft.	Fence (382)	\$1.50	\$1,500.00
			1 (No.)	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 (No.)	Barnyard Run-off Control (357)	\$20,000.00	\$20,000.00
					1 (No.)	Waste Management System (312)	\$13,000.00	\$13,000.00
					700 ft.	Riparian Forested Buffer (391)	\$0.55	\$385.00

No.	Rank	Total Acres	Acres Treated*	Installed BMP's and Code No.	Proposed Acres Treated*	Proposed BMP's	Estimated Cost per Unit	Total Cost
					700 ft.	Riparian Herbaceous Cover (390)	\$0.35	\$245.00
					700 ft.	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 (No.)	Barnyard Run-off Control (357)	\$20,000.00	\$20,000.00
					1 (No.)	Waste Management System (312)	\$13,000.00	\$13,000.00
					2200 ft.	Riparian Forested Buffer (391)	\$0.55	\$1,210.00
					2200 ft.	Riparian Herbaceous Cover (390)	\$0.35	\$770.00
					2200 ft.	Fence (382)	\$1.50	\$3,300.00
126	3	71.9	71.9	Conservation Crop Rotation (328)	1 (No.)	Barnyard Run-off Control (357)	\$20,000.00	\$20,000.00
			71.9	Contour Farming (330)	1 (No.)	Waste Management System (312)	\$13,000.00	\$13,000.00
			68.9	Cover Crop (340)	1350 ft.	Riparian Forested Buffer (391)	\$0.55	\$742.50
			71.9	Nutrient Management (590)	1350 ft.	Riparian Herbaceous Cover (390)	\$0.35	\$472.50
			71.9	Residue Management, Mulch Till (329)	1350 ft.	Fence (382)	\$1.50	\$2,025.00
					1000 ft.	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 (No.)	Barnyard Run-off Control (357)	\$20,000.00	\$20,000.00
					1 (No.)	Waste Management System (312)	\$13,000.00	\$13,000.00
128	3	NA	NA	None	1300 ft.	Riparian Forested Buffer (391)	\$0.55	\$715.00
					1300 ft.	Riparian Herbaceous Cover (390)	\$0.35	\$455.00
					1300 ft.	Fence (382)	\$1.50	\$1,950.00

No.	Rank	Total Acres	Acres Treated*	Installed BMP's and Code No.	Proposed Acres Treated*	Proposed BMP's	Estimated Cost per Unit	Total Cost
					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 (No.)	Barnyard Run-off Control (357)	\$20,000.00	\$20,000.00
					1 (No.)	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 (No.)	Barnyard Run-off Control (357)	\$20,000.00	\$20,000.00
					1 (No.)	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 (No.)	Barnyard Run-off Control (357)	\$20,000.00	\$20,000.00
					1 (No.)	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 (No.)	Barnyard Run-off Control (357)	\$20,000.00	\$20,000.00
			92	Contour Farming (330)	1 (No.)	Waste Management System (312)	\$13,000.00	\$13,000.00
			92	Nutrient Management (590)	850 ft.	Riparian Forested Buffer (391)	\$0.55	\$467.50
			92	Residue Management, Mulch Till (329)	850 ft.	Riparian Herbaceous Cover (390)	\$0.35	\$297.50
					850 ft.	Fence (382)	\$1.50	\$1,275.00
132	3	NA	NA	None	29	Conservation Crop Rotation (328)	\$30.00	\$870.00

No.	Rank	Total Acres	Acres Treated*	Installed BMP's and Code No.	Proposed Acres Treated*	Proposed BMP's	Estimated Cost per Unit	Total Cost
					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 (No.)	Barnyard Run-off Control (357)	\$20,000.00	\$20,000.00
					1 (No.)	Waste Management System (312)	\$13,000.00	\$13,000.00
					825 ft.	Riparian Forested Buffer (391)	\$0.55	\$453.75
					825 ft.	Riparian Herbaceous Cover (390)	\$0.35	\$288.75
					825 ft.	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 (No.)	Barnyard Run-off Control (357)	\$20,000.00	\$20,000.00
					1 (No.)	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 (No.)	Barnyard Run-off Control (357)	\$20,000.00	\$20,000.00
			64	Residue Management, Mulch Till (329)	1 (No.)	Waste Management System (312)	\$13,000.00	\$13,000.00
					1475 ft.	Riparian Forested Buffer (391)	\$0.55	\$811.25
					1475 ft.	Riparian Herbaceous Cover (390)	\$0.35	\$516.25
					1475 ft.	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

No.	Rank	Total Acres	Acres Treated*	Installed BMP's and Code No.	Proposed Acres Treated*	Proposed BMP's	Estimated Cost per Unit	Total Cost
					1 (No.)	Barnyard Run-off Control (357)	\$20,000.00	\$20,000.00
					1 (No.)	Waste Management System (312)	\$13,000.00	\$13,000.00
					3850 ft.	Riparian Forested Buffer (391)	\$0.55	\$2,117.50
					3850 ft.	Riparian Herbaceous Cover (390)	\$0.35	\$1,347.50
					3850 ft.	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 (No.)	Barnyard Run-off Control (357)	\$20,000.00	\$20,000.00
					1 (No.)	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 (No.)	Barnyard Run-off Control (357)	\$20,000.00	\$20,000.00
					1 (No.)	Waste Management System (312)	\$13,000.00	\$13,000.00
138	1	90	72.2	Conservation Crop Rotation (328)	1 (No.)	Barnyard Run-off Control (357)	\$20,000.00	\$20,000.00
			72.2	Contour Farming (330)	1550 ft.	Riparian Forested Buffer (391)	\$0.55	\$852.50
			72.2	Cover Crop (340)	1550 ft.	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 (No.)	Waste Storage Facility (313)				
			1550 ft.	Fence (382)				

No.	Rank	Total Acres	Acres Treated*	Installed BMP's and Code No.	Proposed Acres Treated*	Proposed BMP's	Estimated Cost per Unit	Total Cost
			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 (No.)	Barnyard Run-off Control (357)	\$20,000.00	\$20,000.00
					1 (No.)	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 (No.)	Barnyard Run-off Control (357)	\$20,000.00	\$20,000.00
			65.9	Residue Management, Mulch Till (329)	1 (No.)	Waste Management System (312)	\$13,000.00	\$13,000.00
141	2	66.2	66.2	Conservation Crop Rotation (328)	1650 ft.	Riparian Forested Buffer (391)	\$0.55	\$907.50
			66.2	Contour Farming (330)	1650 ft.	Riparian Herbaceous Cover (390)	\$0.35	\$577.50
			66.2	Cover Crop (340)	1650 ft.	Fence (382)	\$1.50	\$2,475.00
			66.2	Residue Management, Mulch Till (329)	66.2	Residue Management, No-Till (329A)	\$30.00	\$1,986.00
					66.2	Nutrient Management (590)	\$7.50	\$496.50
						TOTAL:		\$4,916,182.75

\* Unless otherwise noted as number (No.) or feet (ft.)

### **Implementation Schedule:**

Farms that currently do not have any BMP's will require extensive outreach efforts on the part of the Conservation District. 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 watershed implementation plan for the Upper Kish watershed 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 installed 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 installed 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 installed 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 installed 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 upcoming TMDL load allocation requirements are met and as many proposed projects as possible are finished. 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 Past, Current and Proposed BMP's:**

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. Sources that might be considered "Other" may include agricultural BMP's that PRedICT does not have efficiency values calculations for, low density urban impacts, or logging. 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 the BMP's modeled by PRedICT. Likewise, only 69% of the total nitrogen load and 49% of the total phosphorous are influenced by BMP's modeled by 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. Two such BMP's are waste management system (312) and waste management facility (313). However, the Conservation District included these BMP's in PRedICT by entering manually calculated values. This was done by attributing these BMP's to nutrient management (BMP 6 in PRedICT) and calculating acreage for each. Care was

taken to not include extra, overlapping acreage for farms with both nutrient management plans and waste storage systems or facilities.

Given these limitations, three scenario files were created for the Upper Kish and were run using PRedICT. These files allow for analysis and calculations of load reductions at multiple points in time. By doing so, the watershed was analyzed at the time of the May 2000 PA DEP attainment sampling, spring 2005 (the current date), and after proposed BMP's are installed.

The initial file included all past BMP practices installed before May 2000 (the reference date) as "Existing" (see table 2, page 17) and all those that were installed between May 2000 and December 2004 as "Future" (see table 3, page 18). 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 (5.4%), and phosphorous (3.3%) 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" BMP's for this scenario was \$72,995.40, the majority of which (93.5%) 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 20) (not included in the initial scenario) were added to projects installed after May 2000 (see table 3, page 18) (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 6.2%- an additional .8% from the first scenario, and total phosphorous declined 3.96%- an additional .66% from the first scenario. These projects,

which are now either finished or in the process of being completed, led to a 2.06% overall pollution load reduction.

The addition of the scheduled BMP's increased the cost by \$194,860 above the estimated cost of the initial scenario, for a total cost of \$267,854.78. 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 past and current were accounted for under "Existing" (see tables 2, 3, 4, pages 17-20). All BMP's proposed in Table 6 (page 23) (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 (18.3%), total nitrogen (22%), and phosphorous (18.8%) 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 \$686,681.00. These numbers estimate that implementing both the scheduled projects (from scenario two) and proposed projects (from scenario three) would lead to a total cost \$954,536. However, these costs were calculated by PRedICT, which does not take all proposed BMP's into consideration. In Table 6 (page 23) 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. Additionally, annual operations and maintenance costs (approximated at 4% per year) would lead to another \$196,647.31

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 it provides substantial decreases in loads. 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. 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, 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:**

Pebble counts and in-stream sediment levels will be used to determine reductions in sediment. These parameters have not been previously measured in this watershed. DEP is committed to developing the criteria for this type of monitoring and establishing baseline data in the Upper Kish watershed. DEP estimates that this process can be completed during the spring of 2006. Sediment is the leading cause of benthic macroinvertebrate degradation. Macroinvertebrate sampling will be completed during the monitoring as well, but is not expected to show dramatic improvement until a significant change has occurred in the watershed. Pebble counts and in-stream sediment levels will demonstrate progressive steps towards this end. PA DEP's sampling will coincide with the BMP implementation schedule.

If the proposed implementation schedule is followed, a milestone would be a reduction in sediment (6.6%), nitrogen (7.9%), and phosphorous (6.85%) by the year 2010. An additional reduction in sediment (13.7%), nitrogen (16.5%), and phosphorous (14.1%) is a projected milestone by the year 2020.

Additional water quality sampling will be done by the Conservation District. 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, page. 3). Sampling will be done and results evaluated by the Conservation District. Water quality data collected by the Conservation District will be compared to the data models generated by DEP or the Conservation District to determine if the practices are having the expected results.

### *Sampling Methods:*

DEP is currently establishing standardized protocols for pebble counts and measuring in-stream sediment loads. DEP is also revising the benthic macroinvertebrate sampling protocol so that it is standardized across the state. Methods used will be in keeping with the established protocol.

Monitoring conducted by the Conservation District will use the same sampling methods for future testing as 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 phosphorus samples will be collected at the same time, but will be sent to the PA DEP lab or a PA DEP approved lab for analysis.

### **Remedial Actions:**

Comparison of prescribed project implementation and water quality milestones to actual results will be done by the Conservation District in order to judge effectiveness and success of those BMP's implemented. The results will be used to determine if progress is being made toward attaining those criteria needed to meet the CWF designation, which is the goal of this plan.

If the results show that progress is still not being made to meet 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 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](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.

# Appendix A

PA DEP 303 (d) Designated Use Attainment Sample Data:

Chemical:

Sample Site	pH	Temperature	Conductivity	Dissolved Oxygen
Kings Hollow 1	6.7	16.5	32	9.2
Kish Creek 1	---	9.6	230	12.4
Kish Creek 2	7.5	9.9	390	10.5
Kish Creek 3	---	---	---	---
Kish Creek 4	---	---	---	---
Little Kish 1	7.5	14.1	440	10.0
Little Kish 2	8.5	18.3	460	16.5
Little Kish 3	6.1	10.4	40	11.6
Little Kish 4	6.6	12.5	100	1.20
Soft Run 1	6.8	9.8	135	11.4

Physical:

Sample Site	Instream Cover	Epifaunal Substrate	Embeddedness	Velocity-Depth Regime	Channelization	Sediment Deposition	Frequency of Riffles	Channel Flow	Channel Banks	Bank Vegetation	Grazing	Riparian Buffer
Kings Hollow 1	18	17	15	15	11	12	18	20	16	19	16	13
Kish Creek 1	15	12	7	16	15	8	5	20	7	5	5	4
Kish Creek 2	11	8	6	10	15	6	7	20	5	7	5	5
Kish Creek 3	8	8	5	10	19	5	10	18	10	5	10	5
Kish Creek 4	2	2	1	8	8	2	2	17	6	4	3	3
Little Kish 1	10	6	3	8	3	7	6	15	17	17	10	2
Little Kish 2	4	6	2	8	16	5	3	15	1	6	2	0
Little Kish 3	15	16	14	11	17	12	19	20	11	13	12	13
Little Kish 4	16	16	12	10	15	11	18	20	10	10	10	5
Soft Run 1	11	5	7	8	15	4	4	20	4	5	3	3

Biological: (VA = Very Abundant, A = Abundant, C = Common, P = Present, R = Rare)

	Kings Hollow 1	Kish Creek 1	Kish Creek 2	Kish Creek 3	Kish Creek 4	Little Kish 1	Little Kish 2	Little Kish 3	Little Kish 4	Soft Run 1
Amphipoda						C	P			
Ancylidae						P			C	
Annelida				A	C					
Asellidae		C							P	
Baetidae	P							R		
Baetiscidae						VA				
Cambaridae	P	P				P		R		C
Capniidae								R		
Chironomidae(other)	P		A	C	A	P		P	A	A
Chironomidae (red)		P				P	P			P
Chloroperlidae	P						P			
Coenagrionidae							R			
Dytiscida			P							
Elmidae	P	A				A		R		P
Empididae		C								
Ephemerellidae								C		
Ephemeridae		R						P		
Glossosomatidae	P									
Heptageniidae	P	C				R		P		
Hydrophilidae				P			R			
Hydropsychidae	P	C				A		P	P	
Leptophlebiidae	C									
Limnephilidae								R		
Nemouridae								R		
Oligochaeta		A	C					P	C	C
Perlidae	P							P		
Perlodidae	C							C		
Philopotamidae	P							R		
Physidae				P		R				
Planorbidae	P						A			
Psephenidae		P				P		C		
Pteronarcyidae	R									
Rhyacophilidae	R									
Sialidae						R	R			
Simuliidae	R		P	C			R		C	
Siphonuridae						P			R	
Sphaeriidae		P								
Tabanidae						R		R	P	
Tipulidae	P	P								
Turbellaria		A	C	C		C	C		P	C
Uenoidae	R							C		

# Appendix B

Kishacoquillas Creek Assessment and Restoration Plan Sampling Data:

Chemical:

<i>Location</i>	<i>Date</i>	<i>Stream Temp in C</i>	<i>pH</i>	<i>Conductivity (mS)</i>	<i>Alkalinity (mg/L CaCO3)</i>	<i>Dissolved O2 (mg/L)</i>
<b>KIHO01</b>	7/10/2001	16.5	6.7	26		15
KIHO01	7/26/2001					
KIHO01	8/2/2001	17.5	6.2	26		60
KIHO01	9/18/2001	14	6.6	26		15
KIHO01	10/16/2001	11	6	27		15
KIHO01	11/8/2001	10	6.8	26		40
KIHO01	12/12/2001	6	7	31		40
KIHO01	1/29/2002	5	7.4	47		40
KIHO01	2/18/2002	2	6.6	34		10
KIHO01	3/5/2002	1	6.1	33		15
KIHO01	4/26/2002	9	5.8	32		15
<b>LKCR01</b>	1/2/2001	2	8.1	262		100
LKCR01	5/15/2001	20	7	250		80
LKCR01	5/16/2001					
LKCR01	6/5/2001	19	7.7	245		100
LKCR01	7/2/2001	22.5	8	344		140
LKCR01	7/26/2001					
LKCR01	8/2/2001	25	7.5	598		280
LKCR01	9/4/2001	22	7.6	604		280
LKCR01	10/2/2001	18	7.5	732		200
LKCR01	11/15/2001	10	7.4	523		200
LKCR01	12/12/2001	7	7.4	455		140
LKCR01	1/9/2002	2	7.3	407		140
LKCR01	2/25/2002	11	7.4	206		80
LKCR01	3/5/2002	1	6.8	165		60
LKCR01	4/24/2002	17	6.9	156		80
<b>LKCR04</b>	12/4/2000	3	8.1	489		200
LKCR04	1/3/2001	1	8.3	444		180
LKCR04	1/11/2001					
LKCR04	5/15/2001	11	7.2	428		180
LKCR04	6/7/2001	19	8	427		180
LKCR04	7/2/2001	19	7.9	480		220
LKCR04	7/26/2001					
LKCR04	8/2/2001	22.5	7.9	510		220
LKCR04	9/25/2001	15	7.5	440		160
LKCR04	10/25/2001	14.5	7.6	494		260
LKCR04	11/6/2001	10	8.4	451		220
LKCR04	12/5/2001	12	7.6	475		240
LKCR04	1/28/2002	5	7.6	378		160
LKCR04	2/22/2002	6	7.8	360		140
LKCR04	3/28/2002	11	7.2	293		120
LKCR04	4/15/2002	18	7.3	304		140

<b>UNLK01</b>					
UNLK01	7/10/2001	21	7.2	77	60
UNLK01	7/26/2001				
UNLK01	8/2/2001	22	6.9	87	60
UNLK01	9/6/2001	18.5	7	84	40
UNLK01	10/2/2001	16.5	6.9	91	80
UNLK01	11/8/2001	13	7.1	81	60
UNLK01	12/12/2001	5	7.3	113	60
UNLK01	1/16/2002	1	7.3	106	60
UNLK01	2/25/2002	9	6.6	180	60
UNLK01	3/5/2002	1	6.4	66	15
UNLK01	4/24/2002	15	6.4	52	60

<b>SORU01</b>	7/10/2001	25	7.7	215	80
SORU01	7/26/2001				
SORU01	8/2/2001	21	7.2	173	100
SORU01	9/6/2001	19	8.4	123	60
SORU01	10/2/2001	16	7.5	155	80
SORU01	11/6/2001	8	7.6	120	80
SORU01	12/5/2001	9	7.7	239	100
SORU01	1/16/2002	1	7.2	288	120
SORU01	2/25/2002	9	7.3	236	80
SORU01	3/27/2002	6	7.5	216	45
SORU01	4/25/2002	9	7.2	272	100

## Physical:

<b>Sample Location</b>	KIHO01	LKCR01	LKCR04	SORU01	UNLK01
Date	7/21/2001	Average	Average	7/28/2001	7/21/2001
Instream Cover (Fish)	20	10.5	12	4	8
Epifaunal Substrate	10	13.5	11	6	18
Embeddedness	13	9	10.5	1	16
Velocity/Depth Regimes	13	13	12.5	13	10
Channel Alteration	11	10.5	15	15	6
Sediment Deposition	9	5	10	1	17
Score Side one	76	61.5	71	40	75
Frequency of Riffles	18	16	11.5	2	20
Channel Flow Status	13	17.5	17	13	15
Condition of Banks	19	11.5	14.5	1	12
Bank Vegetative Protection	19	17.5	18	3	12
Grazing or Other Disruptive	20	11.5	16.5	0	10
Riparian Vegetative width	19	5	7	0	3
Totals (side 2)	108	79	84.5	19	72
Totals (side 1)	76	61.5	71	40	75
<b>Station Score</b>	184	140.5	155.5	59	147
NOTES					
Alpha code	S	S	S	P	S
Optimal - 240-187					
Suboptimal - 186-127	X	X	X		X
Marginal - 126-68					
Poor - 67-0				X	

Biological:

# Appendix C

### Mean Annual Load Data Editor

UPLAND EROSION/RUNOFF	Total Sed (lbs)	Total N (lbs)	Total P (lbs)
Row Crops	9836455	51028	9544
Hay/Pasture	535355	8051	1018
High Density Urban	650	5	1
Low Density Urban	10236	5	1
Unpaved Road	10743	43	9
Other	15300144	48791	11617
STREAMBANK EROSION	3077143	154	68
GROUNDWATER/SUBSURFACE		48321	550
POINT SOURCE DISCHARGE		0	0
SEPTIC SYSTEMS		192	83
<b>TOTAL</b>	28770726	156590	22891
BASIN AREA	19064		

### Agricultural Land BMP Scenario Editor

Acres			BMP1	BMP2	BMP3	BMP4	BMP5	BMP6	BMP7	BMP8
Row Crops	7633	% Existing	7	12	12	0	0	8		0
		% Future	13	19	22	0	0	20		0
Hay/Pasture	3726	% Existing			0	0	0	16	0	0
		% Future			0	0	0	37	3	0
Agricultural Land on Slope > 3%			29.8881943833084			Acres				
Streams in Agricultural Areas			40.9			Miles				
Total Stream Length			58.6			Miles				
			Existing		Future					
Stream Miles with Vegetated Buffer Strips			0		0					
Stream Miles with Fencing			0		.3					
Stream Miles with Stabilization			.2		.2					
Unpaved Road Miles with E and S Controls			0		0					

### Urban Land BMP Scenario Editor

High Density Urban							
Constructed Wetlands				Detention Basins			
Acres	104	% Existing	0			% Existing	8
% Impervious Surface	50	% Future	0			% Future	0
		Impervious Area Drained	0			Impervious Area Drained	0
% Drainage area Used	5	CW Area Drained	0	% Drainage area Used	3	CW Area Drained	0
Low Density Urban							
Constructed Wetlands				Detention Basins			
Acres	252	% Existing	0			% Existing	0
% Impervious Surface	0	% Future	0			% Future	0
		Impervious Area Drained	0			Impervious Area Drained	0
% Drainage area Used	3	CW Area Drained	0	% Drainage area Used	2	CW Area Drained	0
Vegetated Stream Buffers							
						Existing	Future
Stream miles in high density urban areas	.8	Stream miles in high density urban areas w/buffers				0	0
		Streambank Stabilization				0	0
Stream miles in low density urban areas	.5	Stream miles in low density urban areas w/buffers				0	0
		Streambank Stabilization				0	0

### Septic Systems BMP Scenario Editor

Septic Systems and Point Source Discharge Scenario Editor				
		Normal Systems	Short Circuit Systems	
Number of persons on septic Systems	Existing	720	97	
	Future	720	97	
Spetic systems converted by treatment type %	Secondary	0	Tertiary	0
Number of persons on public sewers	Existing	365	Future	0
		Primary	Secondary	Tertiary
Distribution of pollutant discharge by treatment type %	Existing	0	0	.3
	Future	0	0	0
		Primary to Secondary	Primary to Tertiary	Secondary to Teriary
Distribution of treatment upgrades %		0	0	0

## Agriculture and Urban BMP Load Reduction Efficiency Editor

Agrigultural BMP Load Reduction Efficiency Editor			
BMP Type	Nitrogen	Phosphorus	Sediment
BMP 1	0.30	0.06	0.08
BMP 2	0.50	0.38	0.64
BMP 3	0.09	0.09	0.14
BMP 4	0.87	0.09	0.90
BMP 5	0.87	0.77	0.90
BMP 6	0.70	0.28	
BMP 7	0.43	0.34	0.13
BMP 8	0.00	0.00	0.00
Vegetated Buffer Strips	0.64	0.52	0.58
Streambank Fencing	0.56	0.78	0.76
Streambank Stabilization	0.95	0.95	0.95
Unpaved Roads (lbs/ft)	0.02	0.0000	2.55
Urban BMP Load Reduction Efficiency Editor			
BMP Type	Nitrogen	Phosphorus	Sediment
Constructed Wetlands	0.53	0.51	0.88
Detention Basins	0.40	0.51	0.93

## Wastewater BMP Load Reduction Efficiency Editor

	Nitrogen	Phosphorus
Conversion of septic systems to secondary treatment plant	0.14	0.10
Conversion of septic systems to tertiary treatment plant	0.56	0.60
Conversion of primary treatment to secondary treatment	0.14	0.10
Conversion of primary treatment to tertiary treatment	0.56	0.60
Conversion of secondary treatment to tertiary treatment	0.42	0.50

## BMP Cost Editor

<b>Agricultural Cost Editor</b>	
Conservation Tillage (per acre)	\$30.00
Cropland Protection (per acre)	\$20.00
Grazing land management (per acre)	\$220.00
Streambank Fencing (per acre)	\$7.50
Streambank fencing (per mile)	\$7,920.00
Streambank stabilization (per foot)	\$25.00
Vegetated buffer strip (per mile)	\$240.00
Terraces and Diversions (per acre)	\$170.00
Nutrient Management (per acre)	\$7.50
Ag to Wetland Conversion (per acre)	\$30.00
Unpaved Roads (per foot)	\$5.58
Ag to Forest Conversion (per acre)	\$0.00
<b>Urban Cost Editor</b>	
Constructed wetlands (per acre)	\$10,146.00
Detention basins (per acre)	\$19,457.00
<b>Septic System and Point Source Upgrades</b>	
Conversion of septic systems to centralized sewage treatment (per home)	\$15,000.00
Conversion from primary to secondary sewage treatment (per capita)	\$250.00
Conversion from primary to tertiary sewage treatment (per capita)	\$300.00
Conversion from secondary to tertiary sewage treatment (per capita)	\$150.00

### Esitimated Load Reductions

		Existing (lbs)		
UPLAND EROSION/RUNOFF		Total Sed (lbs)	Total N (lbs)	Total P (lbs)
	Row crops	9836455	51028	9544
	Hay/pasture	535355	8051	1018
	High density urban	650	5	1
	Low density urban	10236	5	1
	Unpaved roads	10743	43	9
	Other	15300144	48791	11617
STREAMBANK EROSION		3077143	154	68
GROUNDWATER/SUBSURFACE			48321	550
POINT SOURCE DISCHARGE			0	0
SEPTIC SYSTEMS			192	83
TOTALS		<b>28770726</b>	<b>156590</b>	<b>22891</b>
		Future (lbs)		
LAND EROSION/RUNOFF		Total Sed (lbs)	Total N (lbs)	Total Pphosphorus (lbs)
	Row crops	9210856.462	9210856.462	8861.76739328
	Hay/pasture	533267.1155	6778.9122113	948.36855568
	High density urban	650	5	1
	Low density urban	10236	5	1
	Unpaved roads	10743	43	9
	Other	15300144	48791	11617
STREAMBANK EROSION		3065170.49822526	153.558498293515	67.7284641638225
GROUNDWATER/SUBSURFACE			48310.7400302556	550
POINT SOURCE DISCHARGE			0	0
SEPTIC SYSTEMS			192	83
TOTALS		<b>28120324.0757253</b>	<b>148079.876563849</b>	<b>22129.8644131238</b>
PERCENT REDUCTIONS		2.3	5.4	3.33
TOTAL SCENARIO COST		\$72,995.40		
Ag BMP Cost (%)		93.5		
WW upgrade cost (%)		0.0		
Urban BMP cost (%)		0.0		
Stream protection cost (%)		6.5		
Unpaved road protection cost (%)		0		

# Appendix D

### Mean Annual Load Data Editor

UPLAND EROSION/RUNOFF	Total Sed (lbs)	Total N (lbs)	Total P (lbs)
Row Crops	9836455	51028	9544
Hay/Pasture	535355	8051	1018
High Density Urban	650	5	1
Low Density Urban	10236	5	1
Unpaved Road	10743	43	9
Other	15300144	48791	11617
STREAMBANK EROSION	3077143	154	68
GROUNDWATER/SUBSURFACE		48321	550
POINT SOURCE DISCHARGE		0	0
SEPTIC SYSTEMS		192	83
<b>TOTAL</b>	<b>28770726</b>	<b>156590</b>	<b>22891</b>
BASIN AREA	19064		

### Agricultural Land BMP Scenario Editor

Acres			BMP1	BMP2	BMP3	BMP4	BMP5	BMP6	BMP7	BMP8	
Row Crops	7633	% Existing	7	12	12	0	0	8		0	
		% Future	13	19	22	0	0	21		0	
Hay/Pasture	3726	% Existing			0	0	0	16	0	0	
		% Future			0	0	0	39	3	0	
Agricultural Land on Slope > 3%			29.8881943833084	Acres							
Streams in Agricultural Areas			40.9	Miles							
Total Stream Length			58.6	Miles							
			Existing		Future						
Stream Miles with Vegetated Buffer Strips			0	1							
Stream Miles with Fencing			0	.8							
Stream Miles with Stabilization			.2	.4							
Unpaved Road Miles with E and S Controls			0	0							

### Urban Land BMP Scenario Editor

High Density Urban							
Constructed Wetlands			Detention Basins				
Acres	104	% Existing	0		% Existing	8	
% Impervious Surface	50	% Future	0		% Future	0	
		Impervious Area Drained	0		Impervious Area Drained	0	
% Drainage area Used	5	CW Area Drained	0	% Drainage area Used	3	CW Area Drained	0
Low Density Urban							
Constructed Wetlands			Detention Basins				
Acres	252	% Existing	0		% Existing	0	
% Impervious Surface	0	% Future	0		% Future	0	
		Impervious Area Drained	0		Impervious Area Drained	0	
% Drainage area Used	3	CW Area Drained	0	% Drainage area Used	2	CW Area Drained	0
Vegetated Stream Buffers							
					Existing		Future
Stream miles in high density urban areas	.8	Stream miles in high density urban areas w/buffers	0		0		.7
		Streambank Stabilization	0		0		.3
Stream miles in low density urban areas	.5	Stream miles in low density urban areas w/buffers	0		0		.4
		Streambank Stabilization	0		0		.2

### Septic Systems BMP Scenario Editor

Septic Systems and Point Source Discharge Scenario Editor				
		Normal Systems		Short Circuit Systems
Number of persons on septic Systems	Existing	720		97
	Future	720		97
Spetic systems converted by treatment type %	Secondary	0	Tertiary	0
Number of persons on public sewers	Existing	365	Future	0
		Primary	Secondary	Tertiary
Distribution of pollutant discharge by treatment type %	Existing	0	0	.8
	Future	0	0	0
		Primary to Secondary	Primary to Tertiary	Secondary to Teriary
Distribution of treatment upgrades %		0	0	0

## Agriculture and Urban BMP Load Reduction Efficiency Editor

Agrigcultural BMP Load Reduction Efficiency Editor			
BMP Type	Nitrogen	Phosphorus	Sediment
BMP 1	0.30	0.06	0.08
BMP 2	0.50	0.38	0.64
BMP 3	0.09	0.09	0.14
BMP 4	0.87	0.09	0.90
BMP 5	0.87	0.77	0.90
BMP 6	0.70	0.28	
BMP 7	0.43	0.34	0.13
BMP 8	0.00	0.00	0.00
Vegetated Buffer Strips	0.64	0.52	0.58
Streambank Fencing	0.56	0.78	0.76
Streambank Stabilization	0.95	0.95	0.95
Unpaved Roads (lbs/ft)	0.02	0.0000	2.55
Urban BMP Load Reduction Efficiency Editor			
BMP Type	Nitrogen	Phosphorus	Sediment
Constructed Wetlands	0.53	0.51	0.88
Detention Basins	0.40	0.51	0.93

## Wastewater BMP Load Reduction Efficiency Editor

	Nitrogen	Phosphorus
Conversion of septic systems to secondary treatment plant	0.14	0.10
Conversion of septic systems to tertiary treatment plant	0.56	0.60
Conversion of primary treatment to secondary treatment	0.14	0.10
Conversion of primary treatment to tertiary treatment	0.56	0.60
Conversion of secondary treatment to tertiary treatment	0.42	0.50

## BMP Cost Editor

<b>Agricultural Cost Editor</b>	
Conservation Tillage (per acre)	\$30.00
Cropland Protection (per acre)	\$20.00
Grazing land management (per acre)	\$220.00
Streambank Fencing (per acre)	\$7.50
Streambank fencing (per mile)	\$7,920.00
Streambank stabilization (per foot)	\$25.00
Vegetated buffer strip (per mile)	\$240.00
Terraces and Diversions (per acre)	\$170.00
Nutrient Management (per acre)	\$7.50
Ag to Wetland Conversion (per acre)	\$30.00
Unpaved Roads (per foot)	\$5.58
Ag to Forest Conversion (per acre)	\$0.00
<b>Urban Cost Editor</b>	
Constructed wetlands (per acre)	\$10,146.00
Detention basins (per acre)	\$19,457.00
<b>Septic System and Point Source Upgrades</b>	
Conversion of septic systems to centralized sewage treatment (per home)	\$15,000.00
Conversion from primary to secondary sewage treatment (per capita)	\$250.00
Conversion from primary to tertiary sewage treatment (per capita)	\$300.00
Conversion from secondary to tertiary sewage treatment (per capita)	\$150.00

## Estimated Load Reductions

		Existing (lbs)		
UPLAND EROSION/RUNOFF		Total Sed (lbs)	Total N (lbs)	Total P (lbs)
Row crops		9836455	51028	9544
Hay/pasture		535355	8051	1018
High density urban		650	5	1
Low density urban		10236	5	1
Unpaved roads		10743	43	9
Other		15300144	48791	11617
STREAMBANK EROSION		3077143	154	68
GROUNDWATER/SUBSURFACE			48321	550
POINT SOURCE DISCHARGE			0	0
SEPTIC SYSTEMS			192	83
<b>TOTALS</b>		<b>28770726</b>	<b>156590</b>	<b>22891</b>
		Future (lbs)		
LAND EROSION/RUNOFF		Total Sed (lbs)	Total N (lbs)	Total Pphosphorus (lbs)
Row crops		9080237.95960489	9080237.95960489	8723.7502340106
Hay/pasture		533267.1155	6667.6522219	942.72590384
High density urban		178.75	1	.35
Low density urban		3111.744	1.16	.376
Unpaved roads		10743	43	9
Other		15300144	48791	11617
STREAMBANK EROSION		3035239.2437884	152.323344709898	67.0554266211604
GROUNDWATER/SUBSURFACE			48307.1317768036	550
POINT SOURCE DISCHARGE			0	0
SEPTIC SYSTEMS			192	83
<b>TOTALS</b>		<b>27952178.8128933</b>	<b>146940.063900718</b>	<b>21984.2575644718</b>
PERCENT REDUCTIONS		2.9	6.2	3.96
TOTAL SCENARIO COST		\$267,854.78		
Ag BMP Cost (%)		25.9		
WW upgrade cost (%)		0.0		
Urban BMP cost (%)		0.0		
Stream protection cost (%)		74.1		
Unpaved road protection cost (%)		0		

# Appendix E

### Mean Annual Load Data Editor

UPLAND EROSION/RUNOFF	Total Sed (lbs)	Total N (lbs)	Total P (lbs)
Row Crops	9836455	51028	9544
Hay/Pasture	535355	8051	1018
High Density Urban	650	5	1
Low Density Urban	10236	5	1
Unpaved Road	10743	43	9
Other	15300144	48791	11617
STREAMBANK EROSION	3077143	154	68
GROUNDWATER/SUBSURFACE		48321	550
POINT SOURCE DISCHARGE		0	0
SEPTIC SYSTEMS		192	83
<b>TOTAL</b>	<b>28770726</b>	<b>156590</b>	<b>22891</b>
BASIN AREA	19064		

### Agricultural Land BMP Scenario Editor

Acres			BMP1	BMP2	BMP3	BMP4	BMP5	BMP6	BMP7	BMP8	
Row Crops	7633	% Existing	13	19	22	0	0	17		0	
		% Future	26	29	28	0	0	53		0	
Hay/Pasture	3726	% Existing			0	0	0	35	0	0	
		% Future			0	0	0	100	0	0	
Agricultural Land on Slope > 3%			29.8881943833084	Acres							
Streams in Agricultural Areas			40.9	Miles							
Total Stream Length			58.6	Miles							
			Existing		Future						
Stream Miles with Vegetated Buffer Strips			0	26							
Stream Miles with Fencing			.3	27.5							
Stream Miles with Stabilization			.4	1							
Unpaved Road Miles with E and S Controls			0	0							

### Urban Land BMP Scenario Editor

High Density Urban							
Constructed Wetlands			Detention Basins				
Acres	104	% Existing	0		% Existing	17	
% Impervious Surface	50	% Future	0		% Future	0	
		Impervious Area Drained	0		Impervious Area Drained	0	
% Drainage area Used	5	CW Area Drained	0	% Drainage area Used	3	CW Area Drained	0
Low Density Urban							
Constructed Wetlands			Detention Basins				
Acres	252	% Existing	0		% Existing	0	
% Impervious Surface	0	% Future	0		% Future	0	
		Impervious Area Drained	0		Impervious Area Drained	0	
% Drainage area Used	3	CW Area Drained	0	% Drainage area Used	2	CW Area Drained	0
Vegetated Stream Buffers							
				Existing	Future		
Stream miles in high density urban areas	.8	Stream miles in high density urban areas w/buffers	.7	.7	.7		
		Streambank Stabilization	.3	.3	.3		
Stream miles in low density urban areas	.5	Stream miles in low density urban areas w/buffers	.4	.4	.4		
		Streambank Stabilization	.2	.2	.2		

### Septic Systems BMP Scenario Editor

Septic Systems and Point Source Discharge Scenario Editor				
		Normal Systems		Short Circuit Systems
Number of persons on septic Systems	Existing	720		97
	Future	720		97
Spetic systems converted by treatment type %	Secondary	0	Tertiary	0
	Existing	365	Future	0
		Primary	Secondary	Tertiary
Distribution of pollutant discharge by treatment type %	Existing	0	0	27.5
	Future	0	0	0
		Primary to Secondary	Primary to Tertiary	Secondary to Teriary
Distribution of treatment upgrades %		0	0	0

## Agriculture and Urban BMP Load Reduction Efficiency Editor

Agrigultural BMP Load Reduction Efficiency Editor			
BMP Type	Nitrogen	Phosphorus	Sediment
BMP 1	0.30	0.06	0.08
BMP 2	0.50	0.38	0.64
BMP 3	0.09	0.09	0.14
BMP 4	0.87	0.09	0.90
BMP 5	0.87	0.77	0.90
BMP 6	0.70	0.28	
BMP 7	0.43	0.34	0.13
BMP 8	0.00	0.00	0.00
Vegetated Buffer Strips	0.64	0.52	0.58
Streambank Fencing	0.56	0.78	0.76
Streambank Stabilization	0.95	0.95	0.95
Unpaved Roads (lbs/ft)	0.02	0.0000	2.55
Urban BMP Load Reduction Efficiency Editor			
BMP Type	Nitrogen	Phosphorus	Sediment
Constructed Wetlands	0.53	0.51	0.88
Detention Basins	0.40	0.51	0.93

## Wastewater BMP Load Reduction Efficiency Editor

	Nitrogen	Phosphorus
Conversion of septic systems to secondary treatment plant	0.14	0.10
Conversion of septic systems to tertiary treatment plant	0.56	0.60
Conversion of primary treatment to secondary treatment	0.14	0.10
Conversion of primary treatment to tertiary treatment	0.56	0.60
Conversion of secondary treatment to tertiary treatment	0.42	0.50

## BMP Cost Editor

<b>Agricultural Cost Editor</b>	
Conservation Tillage (per acre)	\$30.00
Cropland Protection (per acre)	\$20.00
Grazing land management (per acre)	\$220.00
Streambank Fencing (per acre)	\$7.50
Streambank fencing (per mile)	\$7,920.00
Streambank stabilization (per foot)	\$25.00
Vegetated buffer strip (per mile)	\$240.00
Terraces and Diversions (per acre)	\$170.00
Nutrient Management (per acre)	\$7.50
Ag to Wetland Conversion (per acre)	\$30.00
Unpaved Roads (per foot)	\$5.58
Ag to Forest Conversion (per acre)	\$0.00
<b>Urban Cost Editor</b>	
Constructed wetlands (per acre)	\$10,146.00
Detention basins (per acre)	\$19,457.00
<b>Septic System and Point Source Upgrades</b>	
Conversion of septic systems to centralized sewage treatment (per home)	\$15,000.00
Conversion from primary to secondary sewage treatment (per capita)	\$250.00
Conversion from primary to tertiary sewage treatment (per capita)	\$300.00
Conversion from secondary to tertiary sewage treatment (per capita)	\$150.00

### Esitimated Load Reductions

		Existing (lbs)		
UPLAND EROSION/RUNOFF		Total Sed (lbs)	Total N (lbs)	Total P (lbs)
Row crops		9836455	51028	9544
Hay/pasture		535355	8051	1018
High density urban		650	5	1
Low density urban		10236	5	1
Unpaved roads		10743	43	9
Other		15300144	48791	11617
STREAMBANK EROSION		3077143	154	68
GROUNDWATER/SUBSURFACE			48321	550
POINT SOURCE DISCHARGE			0	0
SEPTIC SYSTEMS			192	83
<b>TOTALS</b>		<b>28770726</b>	<b>156590</b>	<b>22891</b>
		Future (lbs)		
LAND EROSION/RUNOFF		Total Sed (lbs)	Total N (lbs)	Total Pphosphorus (lbs)
Row crops		5695548.90712274	5695548.90712274	5450.94174516702
Hay/pasture		535355	4387.795	832.724
High density urban		650	5	1
Low density urban		10236	5	1
Unpaved roads		10743	43	9
Other		15300144	48791	11617
STREAMBANK EROSION		1961704.91798635	112.472559726962	42.7193174061433
GROUNDWATER/SUBSURFACE			48220.1574117781	550
POINT SOURCE DISCHARGE			0	0
SEPTIC SYSTEMS			192	83
<b>TOTALS</b>		<b>23503638.8251091</b>	<b>122216.266129257</b>	<b>18578.3850625732</b>
PERCENT REDUCTIONS		18.3	22.0	18.84
TOTAL SCENARIO COST		\$686,681.00		
Ag BMP Cost (%)		12.4		
WW upgrade cost (%)		0.0		
Urban BMP cost (%)		0.0		
Stream protection cost (%)		87.6		
Unpaved road protection cost (%)		0		