JACOBS CREEK WATERSHED IMPLEMENTATION AND RESTORATION PLAN


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Jacobs Creek Watershed Association
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1.0 Watershed Background

Jacobs Creek watershed is a 98 square mile watershed in southwestern Pennsylvania, approximately 30 miles southeast of Pittsburgh. The majority of the watershed is located within Westmoreland County (75%) with a smaller portion in Fayette County (25%). Jacobs Creek, 91 miles in length, flows east to west, and drains into the Youghiogheny River, which flows north to join the Monongahela River.

Jacobs Creek begins along the Chestnut Ridge in Bullskin and Donegal Townships, where the land is primarily forested. Dipping down off the ridge, the creek flows through Mount Pleasant Township, before it becomes the border between Fayette and Westmoreland Counties. Along its way, the creek traverses a variety of land uses including the urban centers of Mount Pleasant and Scottdale, large forested tracts near the headwaters and the confluence, and fertile agricultural lands.

1.1 Study Area

There are approximately 177 miles of stream within the Jacobs Creek watershed, which includes 10 Named tributaries: Laurel Run, Brush Run, Shupe Run, Sherrick Run, Stauffer Run, Mock Hollow, Meadow Run, Barren Run, Greenlick Run and Latta Run. The study area for this report covered the middle portion of the Jacobs Creek watershed including Brush Run, Shupe Run, the lower portion of Greenlick Run, Sherrick Run, Stauffer Run, Mock Hollow, Anderson Run and 7 Unnamed Tributaries to Jacobs Creek. Refer to Figure 1 for a map of the Study Area.

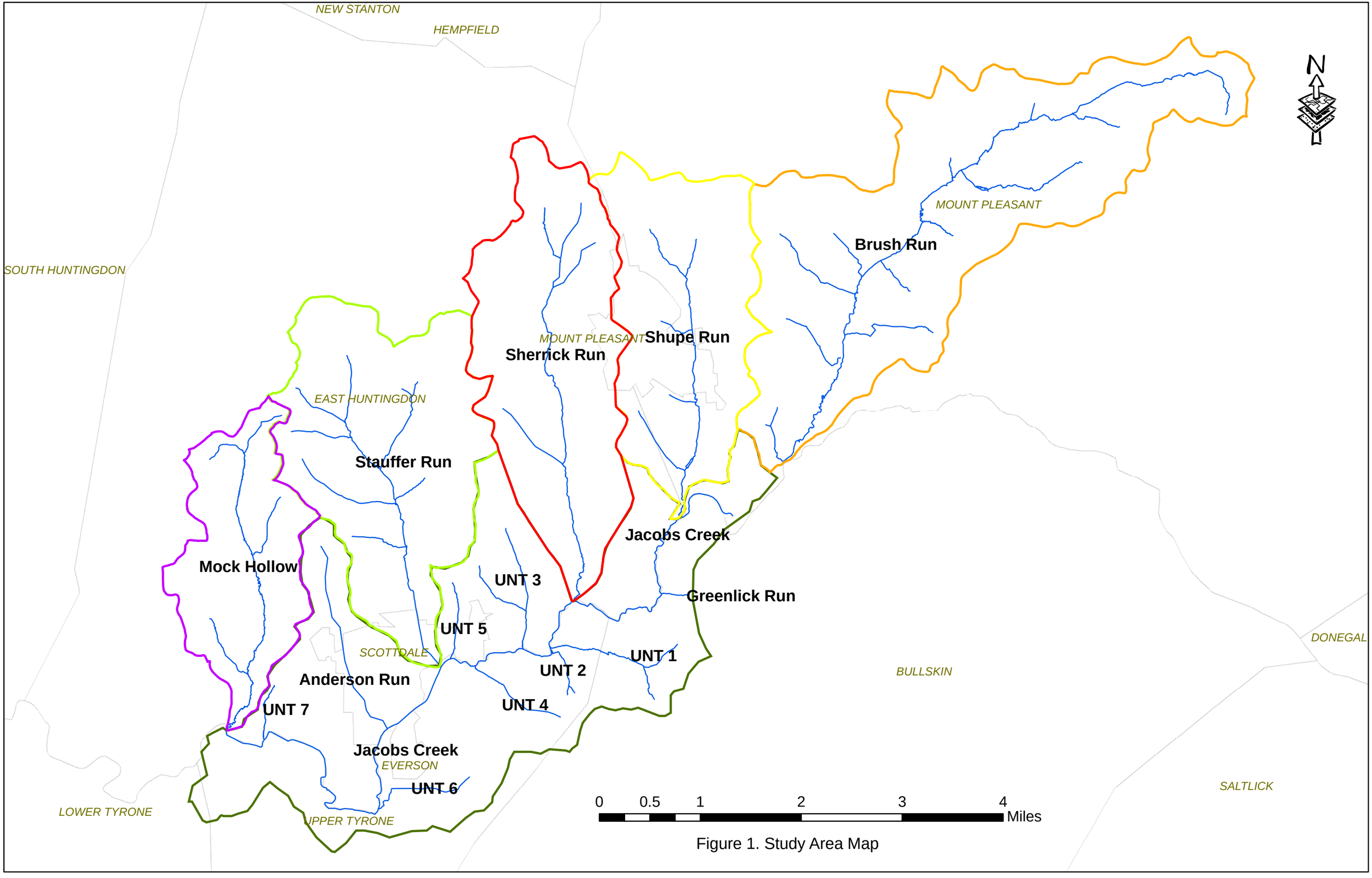


Figure 1. Study Area Map

1.2 Topography, Geology, and Soils

The Jacobs Creek Watershed lies in the Appalachian Plateaus Province. The eastern portion of the watershed is in the Allegheny Mountain Section and the western portion in the Pittsburgh Plateau Section. Maximum elevation exceeds 2,180 ft. above sea level on Chestnut Ridge, falling to about 785 ft. at the confluence with the Youghiogheny River.

The Jacobs Creek Watershed is elongated east to west and the majority of its tributaries enter the main stem at near right angles. The main stream valley is broad and flat in its middle third which includes the study area and is very steep at the headwaters and confluence. The study area stratum is mostly gently folded with dips of greater then 5% rare. On the hill tops the streams take on a dendritic (tree like) drainage pattern. The overall aspect of topography within the study area is one of broad rolling hilltops separated by relatively narrow, steep walled moderately incised valleys. The crest of neighboring hills essentially equal in elevation.

The Jacobs Creek Watershed has Pennsylvanian aged bedrock estimated to be 290 to 330 million years old. These strata are sedimentary rocks which form when materials erode, are deposited and compressed into rock. The Monongahela and Casselmen Groups form the bedrock in the center portion of the watershed. The Monongahela formation contains limestone, mudstone, shale and siltstone. The Casselmen formation contains marine coal and shale and nonmarine clay stones, limestone, shale, and coal. Historically the Pittsburgh Coal has been the watershed's most valuable asset. The Pittsburgh Coal is excellent quality with less than 2% sulfur. The single persistent bed, 4 to 10 feet thick, has been extensively mined in the center of the watershed. Almost all of the mining in the watershed has been underground, although some surface mining is present. The majority of the land area (exceeding 70%) in the study area has been mined.

Three major soil types are located in the study area; Philo-Monongahela-Atkins, Westmoreland-Guernsey-Clarksburg, and Gilpin-Wharton-Cavode. The Westmoreland-Guernsey-Clarksburg, and Gilpin-Wharton-Cavode associations are good for farming, while the Philo-Monongahela-Atkins has limitation for flooding.

1.3 Land Use

The overall land use in the Jacobs Creek Watershed is primarily forested with some minor agriculture in the upper portion of the watershed, urban and agriculture in the middle portion, and forested with agriculture and minor urban areas in the lower portion.

Urban land use in the middle portion of Jacobs Creek, which was the focus of the study, is dominated by Mt. Pleasant Borough located in the Shupe Run Watershed as well as portions of the Sherrick Run Watershed. Jacobs Creek flows just to the south of Mt. Pleasant and is impacted by urban runoff. Scottdale Borough is also a major contributor of urban runoff into the watershed. Anderson Run, Stauffer Run, and UNTs 3, 5, and 6 drain large areas of urban lands into Jacobs Creek. Jacobs Creek itself flows through Scottdale Borough and has been extensively altered by a flood control project at this location.

Agriculture is the other dominate land use that is occurring in the study area. Mock Hollow, Stauffer Run, Sherrick Run, UNTs 1 and 4, Greenlick Run, and Brush Run are dominated by agricultural land use practices. Crops and hay/pasture are the dominate agricultural practices with farm animal production being present but not as prominent.

Large portions of the study area streams are also being impacted by abandoned mine drainage (AMD). Stauffer Run, Shupe Run and Sherrick Run are the most heavily impacted streams with UNTs 2, 6, and Greenlick Run also showing signs of AMD impairments. A land use map is included as figure 2.

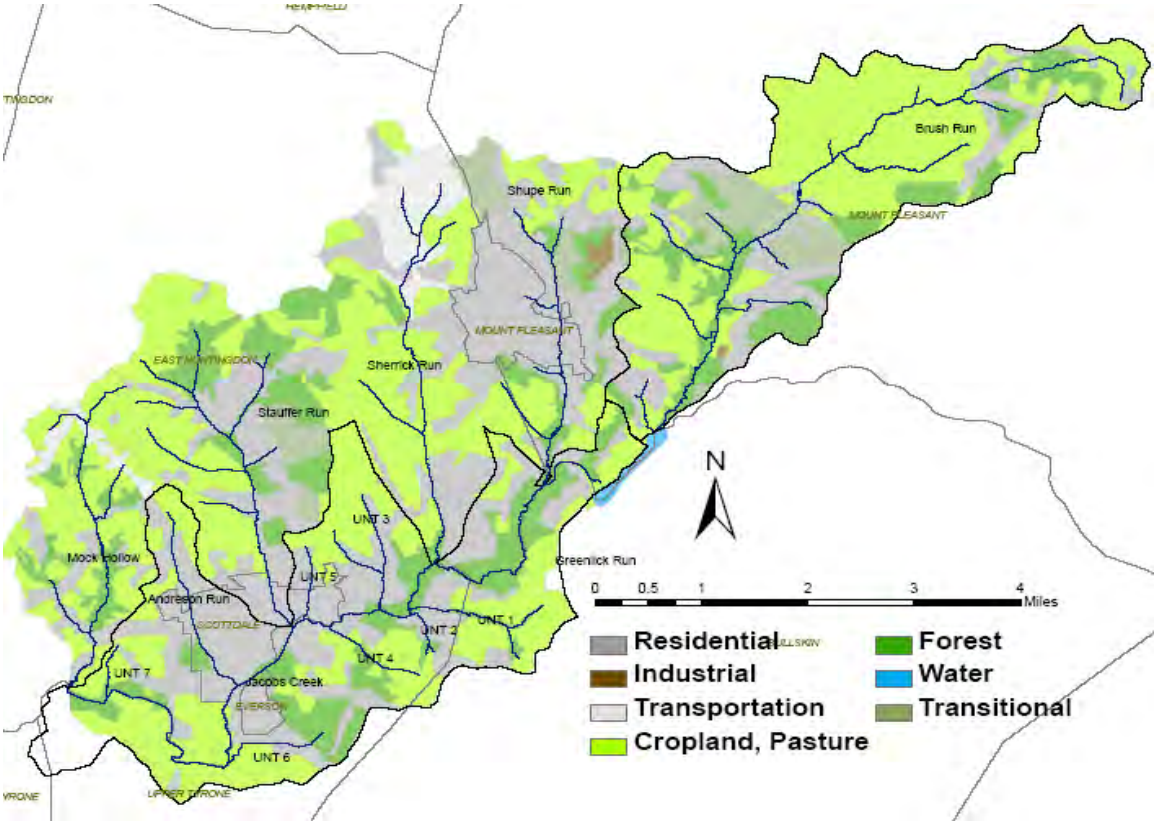


Figure 2. Land Use Map

2.0 Water Quality Standards

The Commonwealth of Pennsylvania, Pennsylvania Code, Title 25, Environmental Protection, Chapter 93, Water Quality Standards outline protected water uses, statewide water uses, and the water quality standards that protect water uses. Jacobs Creek basin from its source to the Bridgeport Dam has a designated protected water use classification of Cold Water Fishery (CWF). From Bridgeport Dam to its confluence with the Youghegany River, Jacobs Creek is designated as a Warm Water Fishery (WWF).

The portion of the Jacobs Creek Watershed that was assessed as part of this study is located in the WWF portion of the basin. Jacobs Creek is required to meet certain water quality standards as designated by Chapter 93. These standards differ depending on the classification type of the particular body of water. A list of some of the applicable water quality standards as related to WWF is included as table 1.

Table 1 Temperature and Water Quality Standards

Temperature

Critical Use Period	Temperature
January 1-31	40
February 1-29	40
March 1-31	46
April 1-15	52
April 16-30	58
May 1-15	64
May16-30	68
June 1-15	80
June 16-31	84
July 1-31	87
August 1-15	87
August 16-30	87
September 1-15	84
September 16-31	78
October 1-15	72
October 16-30	66
November 1-15	58
November 16-30	50
December 1-31	42

Water Quality Standards

Parameter	Criteria
Dissolved Oxygen	daily average 5.0 mg/l; minimum 4.0 mg/l.
Iron (Fe)	30-day average 1.5 mg/l as total recoverable
pH	6.0 to 9.0 inclusive
Alkalinity	Minimum 20 mg/l as $CaCO_3$, except where natural conditions are less
Total Dissolved Solids (TDS)	500 mg/l as a monthly average value; maximum 750 mg/l

3.0 Assessment of Water Quality

The Pennsylvania Department of Environmental Protection (PA DEP) conducted a statewide survey of un-assessed waters to determine if the waters were meeting their Chapter 93 designated uses. PA DEP performed a rapid bio-assessment, classifying streams as either attaining or non-attaining the designated use. Non-attaining streams were listed as impaired and subsequently listed on the Clean Water Act Section 303(d) list of impaired water. The listing of middle portion of Jacobs Creek (from Bridgeport to SR 0819) as being impaired enabled the Jacobs Creek Watershed Association to apply for a grant to conduct a more comprehensive assessment of the impaired portion of watershed.

The grant was awarded to Jacobs Creek in the spring of 2007 and work on the plan began in the summer of 2007. As part of the plan, chemical, biological, and physical sampling was done within the impaired portion of the watershed. Refer to Figure 3 for a map of the 303(d) List impaired streams.

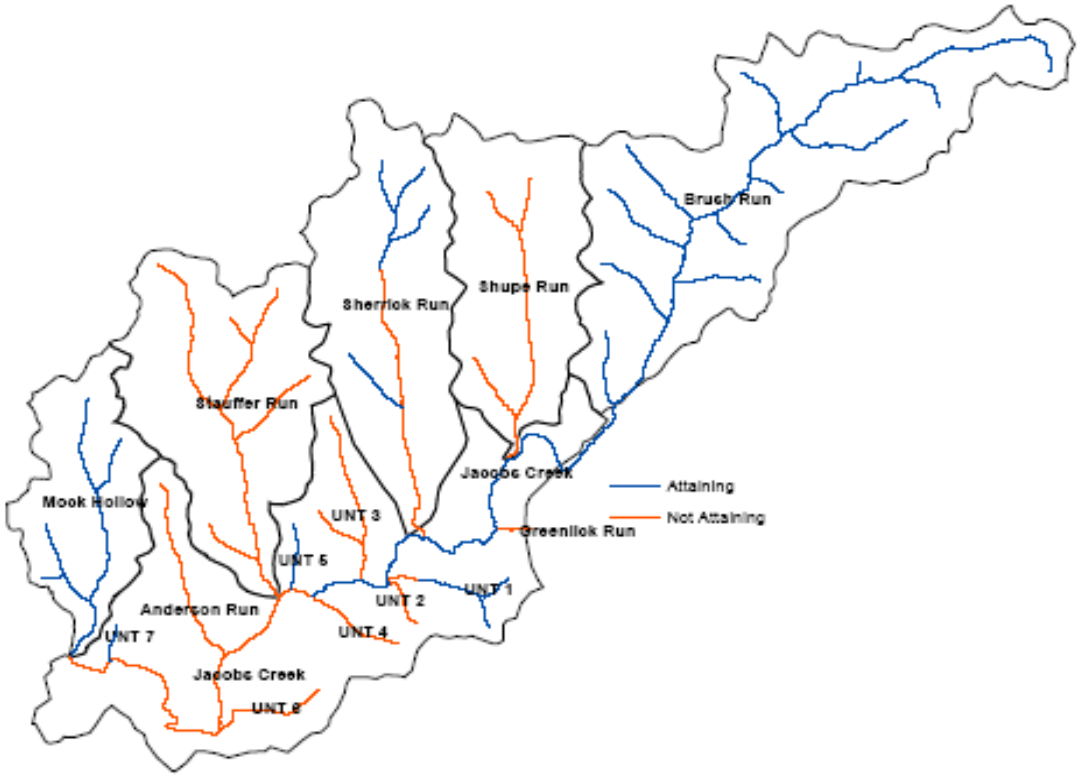


Figure 3. Jacobs Creek 303(d) List Attaining and Non-Attaining Streams

4.0 Total Maximum Daily Loads

The U.S. Environmental Protection Agency (EPA) and PA DEP develop guidelines and conditions which are used to return impaired waters to a status that meets the water quality standards identified in Chapter 93. This is accomplished by assigning a Total Maximum Daily Load (TMDL), which quantifies the loading capacity of a water body based on a specific pollutant. This allows a schematic to be developed which can quantify loading among pollution sources.

The TMDL is the limit of allowable loading of a specific pollutant from all point and non-point sources. A margin of safety and seasonal variations in water quality are all considered when the TMDL is developed. TMDLs are established in accordance with the EPA Section 319(h) of the Clean Water Act and their primary focus is on non-point source pollution management.

TMDLs are developed by combining scientific models with stream sampling data. Current load rates are developed from models and checked with sampling. As BMPs are implemented additional sampling is performed to determine if load reductions have occurred. The goal of the TMDL is to provide information on water quality impairments and impairment sources.

Currently, no TMDLs have been developed for the Jacobs Creek Watershed. They are expected to be completed by the PA DEP and available soon. In the absences of the TMDLs, loads were calculated using Penn State University's ArcView Generalized Watershed Loading Function (AVGWLF) model. This model estimated the current pollution loads in the watershed. As TMDLs become available, they will be compared to the calculated loads projected for the watershed. Adjustments will be made based on the results. Modeling is discussed in more detail in section 7.0 Modeling Tools of this report.

5.0 Problem Identification

Three primary sources of non point source pollutions were identified as the major causes of impairments to the Jacobs Creek Watershed. The three primary sources are: pollution resulting from existing agricultural practices, pollution runoff from urban and developing areas and pollution from past deep and surface coal mining practices. Each of these sources is a primary cause of degradation to at least one of the major tributaries to Jacobs Creek and collectively all have caused major impairments to Jacobs Creek.

5.1 Agricultural Practices

Pollution from existing agricultural practices includes nutrient loading and sedimentation. Numerous BMPs have been implemented in the watershed within the last 10 years including stream bank fencing, waste storage, and cropland management practices. The Conservation Districts and NRCS have been working closely with the property owners implementing BMPs designed to minimize the impacts of current agricultural practices on the receiving waters. Only about half of the farms in the study area have conservation plans and many of those are not as complete as they need to be. Most plans identify multiple BMPs which address various aspects of farming such as row crops, hay fields, pasture, and animal operations.

5.2 Urban Runoff

Mt. Pleasant and Scottdale Boroughs are two urban centers that are located within the impaired area of the watershed. The two boroughs were developed prior to the enactment of any stormwater management regulations. The majority of the runoff from the urban areas is not controlled by any BMPs, which causes flash flooding of the streams, accelerated erosion of the stream banks, and contributes to the nutrient pollution of the streams. Both centers are also experiencing sprawl characterized by the conversion of outlying areas from forested and agriculture land use into residential housing and box store development.

The Westmoreland Conservation District has been working with Mt. Pleasant Borough to identify areas where the installation of BMPs will help reduce runoff impacts. The Jacobs Creek Watershed Association would like to develop a similar process that could be implemented in Scottdale Borough. By working with the municipalities the hope is to correct the existing problems and prevent addition issues from being created in the future. The municipal ordinances need to be reviewed and updated to promote livable high density communities that preserve open space.

5.3 Abandoned Mine Drainage

Abandoned mine drainage (AMD) and runoff from mine spoil piles are impacting Jacobs Creek throughout the study area. Impacted waters are typified by low pH, high dissolved minerals such as iron, sulfur and aluminum, and low dissolved oxygen. Impacted steams also display little to no biological function. The Jacobs Creek Watershed Association and the PA DEP have been sporadically monitoring several of the discharges within the impaired area, but additional data is required to develop the appropriate BMPs to alleviate the impacts caused by AMD and spoil pile runoff.

5.4 Problems Identified by Sub-watershed

Brush Run

Brush Run is approximately 5,486 acres or 8.6 square miles in size and is located in the northeastern portion of the middle Jacobs Creek Watershed (Figure 1). Brush Run begins on the Chestnut Ridge and drains southwest to its confluence with Jacobs Creek at Bridgeport. Land use in the Brush Run watershed is primarily agriculture and is a major contributor to the sediment and nutrient pollution that is occurring downstream in Jacobs Creek.

Shupe Run

The Shupe Run watershed is approximately 2,567 acres or 4.01 square miles in size. It is located in the north central portion of the middle Jacobs Creek Watershed (Figure 1). Its headwaters are located near the SR 0981 – SR 0819 interchange north of Mount Pleasant and it flows through Mount Pleasant Borough towards the south empting into Jacobs

Creek south of Bridgeport. The entire length of the stream is listed as impaired on the 303(d) list. The causes of impairment are defined as sewage, silt, AMD, and urban development.

Sherrick Run

Sherrick Run is approximately 3,015 acres or 4.71 square miles in size. It is located in the north central portion of the middle Jacobs Creek Watershed (Figure 1). Its headwaters are located near the SR0119 – Westmoreland Industrial Park interchange to the north of Mount Pleasant and it flows along SR 0119 west of Mount Pleasant Borough towards the south empting into Jacobs Creek south of the SR0819 – SR 0119 interchange near the Fayette County Line. Land use in the Sherrick Run watershed consists of mainly agricultural lands, receiving some urban runoff from the Mt. Pleasant area. Sherrick Run is listed as impaired from the SR 0031 overpass downstream to its confluence with Jacobs Creek. The causes of impairment are defined as road-runoff, AMD and urban development

Stauffer Run

Stauffer Run is approximately 3,242 acres or 5.07 square miles in size and is located in the northwestern portion of the middle Jacobs Creek Watershed (Figure 1). Stauffer Run originates in the predominantly agricultural areas north and west of Scottdale flowing south to its confluence with Jacobs Creek in Scottdale Borough. Land use in the Stauffer Run watershed consists primarily of agricultural and residential with some light industrial areas. The Greenridge Municipal Landfill is located in the center portion of the Stauffer Run watershed. All of Stauffer Run is listed as impaired on the 303(d) list. The causes of impairment are defined as flow alteration and AMD.

Mock Hollow

Mock Hollow is approximately 1,792 acres or 2.8 square miles in size and is located in the southwestern portion of the middle Jacobs Creek Watershed (Figure 1). Mock Hollow begins south of SR 0981 in East Huntingdon Township and drains south to its confluence with Jacobs Creek at SR 819. The land use in the Mock Hollow watershed is primarily agricultural and is a major contributor to the sediment and nutrient pollution that is occurring downstream in Jacobs Creek.

Middle Jacobs Creek (From Bridgeport Dam to SR 0819 Crossing)

For the purpose of this study, Middle Jacobs Creek includes the main stem of Jacobs Creek from Bridgeport Dam to SR 819. Also included in this area is Greenlick Run from the Greenlick Dam to its confluence with Jacobs Creek, UNTs 1 – 7, and Anderson Run. These tributaries were included with the main stem of Jacobs Creek for modeling purposes. This area covers the entire southern portion of the middle Jacobs Creek watershed including the towns of Bridgeport, the southern portion of Mt. Pleasant Borough, Scottdale, and Everson. The agricultural areas south of Mt Pleasant and east of Scottdale are also included in this area. UNTs 2,3,4 & 6, Anderson Run, and Jacobs Creek from Scottdale to SR 819 are all listed as impaired on the 303(d) list. The causes of impairment are defined as flow alteration, urban runoff, and AMD.

Table 2 shows the annual loading rates for sediment, nitrogen and phosphorous based on pounds per acre. The load rates were generated using the (AVGWLF) model. Sediment is the dominant pollutant within the watershed and can be attributed to agricultural and urban land uses. Stauffer Run and Sherrick Run have the highest loading rates for sediment, both over 500 lbs./ac. Nitrogen and Phosphorous are primarily agricultural land use pollutants, but can also be contributed to failing septic systems and yard fertilizer run off in urban areas. Sherrick Run and Jacobs Creek are both high for Nitrogen, and Mock Hollow is highest for Phosphorous.

Table 2. Loading Rates

Watershed	Acres	Tot Sed (lbs.)	Sed Rate(lbs./ac)	Total N (lbs.)	N Rate (lbs./ac)	Total P (lbs.)	P Rate(lbs./ac)
Brush	5485.7	1638400	299	57177.7	10.4	2077.5	0.38
Shupe	2567.4	1126600	439	26484.8	10.3	780.7	0.30
Sherrick	3014.7	1751600	581	36524	12.1	1249.4	0.41
Stauffer	3242.0	1905800	588	24889.9	7.7	1293.5	0.40
Mock Hollow	1791.5	712600	398	19952.1	11.1	1462.8	0.82
Jacobs Creek	6792.9	2323600	342	86257.9	12.7	2219.7	0.33

6.0 Prioritization

Projects developed in this plan have been assigned a priority ranking. The ranking is meant to be a blueprint for the use of this plan as to what projects should be addressed first. Each project is different in scope, cost, and the amount of load reduction related to the project. The rankings are based on severity of pollution, proximity to the stream, slope, complexity of the project, and location in the watershed. A prioritization of 1 means that the project is a problem area that needs to be addressed as soon as possible, while a ranking of 4 means the project is not an immediate concern.

These rankings are only to be used as a guide to which projects should be completed first. For example, if a property owner is more willing to implement one project than another the willing property owner's project should take priority. AMD and stormwater projects will be more costly than agricultural BMPs, so analysis needs to be given to which projects will provide the most benefit for the cost.

7.0 Modeling Tools

Several computer models were utilized during the development of this plan. Information for the Jacobs Creek Watershed was obtained through ground survey, conservation plans review, interviews, and aerial photography. This information was entered into ArcView Software and several models were developed for the watershed.

Based on information gathered about the watershed, scenario files were created for the watershed using Penn State University's AVGWLF model. This model estimated the current pollution loads in the watershed. The existing BMPs were entered into Penn State University's ArcView Non-Point Source Tool (AVNPS) which determined the effectiveness of current BMPs. These models were used as a baseline for the existing conditions in the watershed. The scenario files and BMP models were used to develop a tool to calculate load reduction values.

PRedICT combines the data developed in the AVNPS tool and the AVGWLF scenario files for each particular watershed. PRedICT calculates load reductions based on BMPs. Future BMP information can be analyzed to determine the pollution load reduction amounts. The effectiveness of each of the proposed projects is measured using the PRedICT model. PRedICT will also approximate the cost to implement each BMP which can be used as a guide for funding.

PRedICT can be used for agricultural BMPs and Urban BMPs, but does not support AMD projects at this time. The PA DEP's AMD TREAT modeling tool will be used to develop appropriate AMD BMPs. Additional studies need to occur before adequate information is available to develop the AMD TREAT model.

8.0 Past Management Measures

The tables below illustrate the BMPs currently implemented with the assistance of the Conservation Districts and the NRCS as well as those that the land owners implemented on the property without any assistance. Those implemented without any assistance were estimated from aerial photographs and field reconnaissance. The BMPs implemented are expressed as a percent of the total agricultural land in production or percent of developed land treated.

Table 3. Existing BMPs by Watershed

Brush Run

Agricultural Practices			
	Existing		**Existing**
Crop BMPs			
Cropland Protection	80%	Nutrient Management	25%
Conservation Tillage	10%	Terraces/ Diversions	0%
Stripcropping/ Contour Farming	80%		
Pasture BMPs			
Grazing Land Management	75%		
Other BMPs			
Waterway	0%	Filter Strips	10%
Waste Facilities	0%	Field Borders	50%
Barnyard Controls	10%		
Stream Bank BMPs			
Vegetative Buffers	50%	Streambank Stabilized/	0%
Fencing	0%	FGM Projects	

Urban Practices			
High Density BMPs			
Constructed Wetlands	0%	Bioretention Areas	0%
Detention Basins	0%	Special Detention Areas	0%
Low Density BMPs			
Constructed Wetlands	0%	Bioretention Areas	0%
Detention Basins	0%	Special Detention Areas	0%
Other BMPs			
Impervious Reductions	0%	Capture-reuse	0%
Filtering	0%		
Rooftop Disconnects	0%		

No AMD treatment projects have been developed in the Brush Run watershed.

Shupe Run

Agricultural Practices			
	Existing		**Existing**
Crop BMPs			
Cropland Protection	80%	Nutrient Management	25%
Conservation Tillage	0%	Terraces/ Diversions	0%
Stripcropping/ Contour Farming	50%		
Pasture BMPs			
Grazing Land Management	50%		
Other BMPs			
Waterway	0%	Filter Strips	0%
Waste Facilities	0%	Field Borders	10%
Barnyard Controls	0%		
Stream Bank BMPs			
Vegetative Buffers	50%	Streambank Stabilized/	0%
Fencing	0%	FGM Projects	

Urban Practices			
High Density BMPs			
Constructed Wetlands	0%	Bioretention Areas	0%
Detention Basins	5%	Special Detention Areas	0%
Low Density BMPs			
Constructed Wetlands	0%	Bioretention Areas	0%
Detention Basins	10%	Special Detention Areas	0%
Other BMPs			
Impervious Reductions	0%	Capture-reuse	0%
Filtering	0%		
Rooftop Disconnects	0%		

No AMD treatment projects have been developed in the Shupe Run watershed.

Sherrick Run

Agricultural Practices			
	Existing		**Existing**
Crop BMPs			
Cropland Protection	70%	Nutrient Management	30%
Conservation Tillage	0%	Terraces/ Diversions	0%
Stripcropping/ Contour Farming	80%		
Pasture BMPs			
Grazing Land Management	50%		
Other BMPs			
Waterway	0%	Filter Strips	5%
Waste Facilities	0%	Field Borders	20%
Barnyard Controls	0%		
Stream Bank BMPs			
Vegetative Buffers	50%	Streambank Stabilized/	0%
Fencing	0%	FGM Projects	

Urban Practices			
High Density BMPs			
Constructed Wetlands	0%	Bioretention Areas	0%
Detention Basins	10%	Special Detention Areas	0%
Low Density BMPs			
Constructed Wetlands	0%	Bioretention Areas	0%
Detention Basins	15%	Special Detention Areas	0%
Other BMPs			
Impervious Reductions	0%	Capture-reuse	0%
Filtering	0%		
Rooftop Disconnects	0%		

No AMD treatment projects have been developed in the Sherrick Run watershed.

Stauffer Run

Agricultural Pracitces			
	Existing		**Existing**
Crop BMPs			
Cropland Protection	80%	Nutrient Management	30%
Conservation Tillage	10%	Terraces/ Diversions	0%
Stripcropping/ Contour Farming	75%		
Pasture BMPs			
Grazing Land Management	80%		
Other BMPs			
Waterway	0%	Filter Strips	10%
Waste Facilities	0%	Field Borders	30%
Barnyard Controls	10%		
Stream Bank BMPs			
Vegitative Buffers	50%	Streambank Stabilized/	15%
Fencing	0%	FGM Projects	

Urban Practices			
High Density BMPs			
Constructed Wetlands	0%	Bioretention Areas	0%
Detention Basins	0%	Special Detention Areas	0%
Low Density BMPs			
Constructed Wetlands	0%	Bioretention Areas	0%
Detention Basins	5%	Special Detention Areas	0%
Other BMPs			
Impervious Reductions	0%	Capture-reuse	0%
Filtering	0%		
Rooftop Disconnects	0%		

No AMD treatment projects have been developed in the Stauffer Run watershed.

Mock Hollow

Agricultural Pracitces			
	Existing		**Existing**
Crop BMPs			
Cropland Protection	90%	Nutrient Management	30%
Conservation Tillage	15%	Terraces/ Diversions	0%
Stripcropping/ Contour Farming	70%		
Pasture BMPs			
Grazing Land Management	75%		
Other BMPs			
Waterway	0%	Filter Strips	10%
Waste Facilities	0%	Field Borders	10%
Barnyard Controls	10%		
Stream Bank BMPs			
Vegitative Buffers	50%	Streambank Stabilized/	0%
Fencing	0%	FGM Projects	

Urban Practices			
High Density BMPs			
Constructed Wetlands	0%	Bioretention Areas	0%
Detention Basins	0%	Special Detention Areas	0%
Low Density BMPs			
Constructed Wetlands	0%	Bioretention Areas	0%
Detention Basins	0%	Special Detention Areas	0%
Other BMPs			
Impervious Reductions	0%	Capture-reuse	0%
Filtering	0%		
Rooftop Disconnects	0%		

No AMD treatment projects have been developed in the Mock Hollow watershed.

Jacobs Creek

Agricultural Pracitces			
	Existing		**Existing**
Crop BMPs			
Cropland Protection	70%	Nutrient Management	25%
Conservation Tillage	0%	Terraces/ Diversions	0%
Stripcropping/ Contour Farming	70%		
Pasture BMPs			
Grazing Land Management	60%		
Other BMPs			
Waterway	0%	Filter Strips	10%
Waste Facilities	0%	Field Borders	50%
Barnyard Controls	0%		
Stream Bank BMPs			
Vegitative Buffers	80%	Streambank Stabilized/	50%
Fencing	0%	FGM Projects	

Urban Practices			
High Density BMPs			
Constructed Wetlands	0%	Bioretention Areas	0%
Detention Basins	10%	Special Detention Areas	0%
Low Density BMPs			
Constructed Wetlands	20%	Bioretention Areas	0%
Detention Basins	10%	Special Detention Areas	0%
Other BMPs			
Impervious Reductions	0%	Capture-reuse	0%
Filtering	0%		
Rooftop Disconnects	0%		

No AMD treatment projects have been developed in the Jacobs Creek watershed.

9.0 Current Management Measures

Several different projects are occurring in the Middle Jacobs Creek Watershed that will help address the problems that were identified in this plan. Partners involved in these projects include the Fayette and Westmoreland County Conservation Districts, the Jacobs Creek Watershed Association, PA DEP District Mining Office, NRCS, and several private consulting groups and other non-profit organizations.

The Westmoreland Conservation District completed a streambank stabilization project along Shupe Run in Mt. Pleasant Borough in the summer of 2008. Sediment was removed from the channel and the stream banks were stabilized with rock armor and live plantings. Approximately 400 feet of streambank was stabilized reducing the potential for accelerated erosion and sedimentation pollution to occur.

The Fayette County Conservation District and NRCS completed a streambank stabilization and stream fencing project along Greenlick Run in the summer of 2008. A stabilized stream crossing for animals and equipment was also installed as part of this project.

The Jacobs Creek Watershed Association and the PA DEP District Mining Office are also developing an AMD treatment facility for 2 discharges located in the Stauffer Run watershed. The project, which is being funded through the Growing Greener program, is

in the data collection and design phase. Additional funding will need to be secured in the future for construction of the project.

Mt. Pleasant Borough is currently working with the Westmoreland County Conservation District to develop retrofit stormwater management BMPs for several large parking areas which are located in the Borough. These projects are being funded through the PA DEP Section 319 non point source management program.

All of these projects which are located within the study area will help improve water quality in the Jacobs Creek watershed. They are good examples of the willingness of several different groups working together to improve the water quality of Jacobs Creek and are also all good examples of the diversity of projects that need to be implemented to restore the watershed.

10.0 Technical and Financial Assistance

The estimated cost for each BMP was determined by researching the average cost to implement each BMP of past projects in or near the study area. Other sources were also used to estimate the potential for BMPs including the PRedICT Model cost estimation calculator. The estimated BMP financial assistance needed is summarized in Table 4.

Table 4. Estimated BMP Financial Assistance

Agricultural BMP	Design and Construction Cost	Annual Operation and Maintenance Cost	Potential Funding Sources
Conservation Crop Rotation (328)	$20.00 / acre	$1.20 / acre	Growing Greener, 319 Program, NRCS, other
Contour Farming (330)	$10.00 / acre	$.50 / acre	Growing Greener, 319 Program, NRCS, other
Nutrient Management (590)	$7.50 / acre	$.50 / acre	Growing Greener, 319 Program, NRCS, other
Residue Management / No Till (329A)	$30.00 / acre	$1.20 / acre	Growing Greener, 319 Program, NRCS, other
Cover Crop (340)	$20.00 / acre	$1.00 / acre	Growing Greener, 319 Program, NRCS, other
Barnyard Run-off (357)	$20,000.00	$800.00	Growing Greener, 319 Program, NRCS, other
Waste Management Systems (312)	$13,000.00	$600.00	Growing Greener, 319 Program, NRCS, other

Riparian Buffer (391)	**$1.00 / foot**	**NA**	**Growing Greener, 319 Program, NRCS, other**
Fencing (382)	**$3.00 / foot**	**$0.10 / foot**	**Growing Greener, 319 Program, NRCS, other**
Channel Stabilization (584)	**$25.00 / foot**	**$1.00 / foot**	**Growing Greener, 319 Program, NRCS, other**
Filter Strips (393)	**$200.00 / acre**	**$10.00 / acre**	**Growing Greener, 319 Program, NRCS, other**
Pasture Planting (512)	**$200.00 / acre**	**$10.00 / acre**	**Growing Greener, 319 Program, NRCS, other**
Nutrient Management Plan (590)	**$8.00 / acre**	**$0.50 / acre**	**Growing Greener, 319 Program, NRCS, other**
Field Borders (386)	**$200.00 / acre**	**$10.00 / acre**	**Growing Greener, 319 Program, NRCS, other**

Urban Stormwater BMP	Design and Construction Cost	Annual Operation and Maintenance Cost	Potential Funding Sources
Bioretention Areas	**$8,000 / impervious acre**	**$400.00**	**Growing Greener, 319 Program, DOT, developers, other**
Constructed Wetlands	**$14,000 / impervious acre**	**$100.00**	**Growing Greener, 319 Program, DOT, developers, other**
Detention Basins	**$11,000 / impervious acre**	**$100.00**	**Growing Greener, 319 Program, DOT, developers, other**

AMD BMP	Design and Construction Cost	Annual Operation and Maintenance Cost	Potential Funding Sources
Varies based on pollution levels	**Varies**	**Varies**	**Growing Greener, 319 Program, OSM, WPCAMR, BAMR, other**

Technical assistance is available from various different government agencies depending on which type of project is being developed. Agricultural projects can receive technical assistance from the county conservation districts, NRCS, Penn State Co-op Extension, and other agricultural service providers. The Westmoreland Conservation District has a professional engineer and landscape architect on staff to offer assistance in developing urban stormwater projects. Office of Surface Mining (OSM), Bureau of Abandoned Mine Reclamation (BAMR), PA DEP District Mining, and Western Pennsylvania Coalition for Abandoned Mine Reclamation (WPCAMR) all offer technical assistance for the development of AMD treatment facilities. Other state agencies also offer technical assistance, such as the PA Fish and Boat Commission to stabilize banks and develop habitat and buffers along lakes and streams.

11.0 Proposed Projects

11.1 Proposed Agricultural Land Projects

The agricultural land project summaries represent projects that have been determined to be the highest priority projects. They were developed based on existing information that was collected during the development of the implementation plan and prioritization may change based on further investigation. The locations of the projects are depicted on Figure 4.

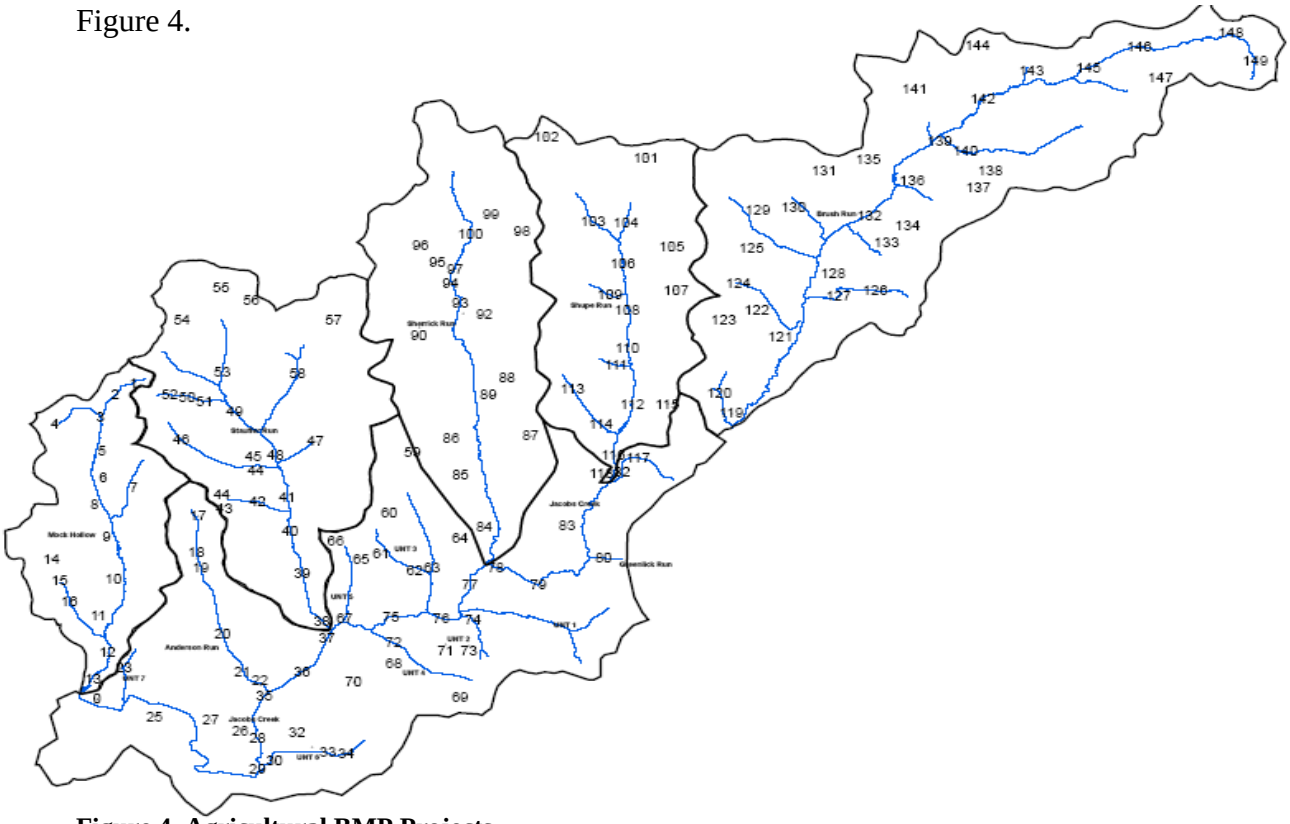
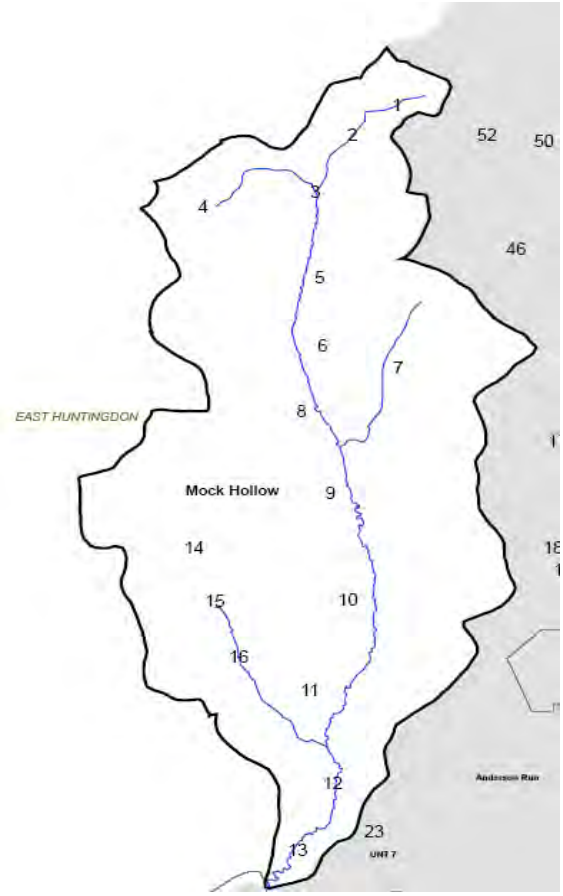


Figure 4. Agricultural BMP Projects

In order to reduce sediment, which is the largest pollutant in the watershed, stream bank fencing, stream bank stabilization and riparian buffers are prescribed for any agricultural area that borders a water course. Due to the cost to implement all of these BMPs being prohibitive, each practice can be implemented as one project or broken down and implemented as funding becomes available. The following is a complete list of the proposed projects per watershed with priority 1 and 2 projects highlighted in red. Summaries of the priority 1 and 2 projects follow with project descriptions, pollution

reductions, and funding options. Copies of the PRedICT model data is included in Appendix A.

Mock Hollow Watershed



Site #1: Farm (Priority 3)

- Contour Farming 20 acres
- Vegetative Buffer 1260LF
- Streambank Stabilization 390LF

Site #2: Farm (Priority 4)

- Vegetative Buffer 410LF
- Streambank Stabilization 180LF

Site #3: Farm (Priority 4)

- Vegetative Buffer 1390LF
- Streambank Stabilization 420LF

Site #4: Farm (Priority 2)

- Vegetative Buffer 690LF
- Streambank Stabilization 350LF
- Contour Farming 120 acres

Site #5: Farm (Priority 4)

- Contour Farming 30 acres

Site #6: Farm (Priority 1)

- Vegetative Buffer 2610LF
- Streambank Stabilization 110LF

Site #7: Farm (Priority 3)

- Vegetative Buffer 1390LF
- Streambank Stabilization 380LF

Site #8: Farm (Priority 1)

- Vegetative Buffer 2610LF
- Streambank Stabilization 110LF

Site #9: Farm (Priority 3)

- Vegetative Buffer 1980LF
- Streambank Stabilization 160LF

Site #10: Farm (Priority 1)

- Vegetative Buffer 2410LF
- Streambank Stabilization 140LF
- Contour Farming 50 acres

Site #11: Farm (Priority 4)

- Strip Farming 50 acres
- Contour Farming 20 acres

Site #12: Unknown (Priority 3)

- Vegetative Buffer 2190LF
- Streambank Stabilization 420LF

Site #13: Farm (Priority 3)

- Vegetative Buffer 1970LF
- Streambank Stabilization 390LF
-

Site #14: Farm (Priority 4)

- Vegetative Buffer 710LF

Site #15: Farm (Priority 3)

- Vegetative Buffer 1510LF

Site #16: Several Property Owners (Priority 4)

- Streambank Stabilization 220 LF

Site #4 Farm

Priority 2

JCWA will request funding to do stabilization along 350 feet of a UNT. In addition to the stabilization, a vegetative buffer will be created for 690 feet of the channel. Better land management practices, such as contour farming, will also be proposed for implementation on the property. Once complete, the project will result in the removal of 26 thousand pounds of sediment annually.

Funding:

EPA 319 – $27,068.00 for design and construction

JCWA,Westmoreland Conservation District and NRCS **–** Project management and additional funding

Timeline **–** Funding will be requested once agreements are in place with property owner

Site #6 Farm

Priority 1

JCWA will request funding to do stabilization along 310 feet of a UNT. In addition to the stabilization, a vegetative buffer will be created for 2,340 feet of the channel. Once complete, the project will result in the removal of 58 thousand pounds of sediment annually.

Funding:

EPA 319 – $27,900.00 for design and construction

JCWA and NRCS – Project management and additional funding

Timeline – Funding will be requested once agreements are in place with property owner

Site #8 Farm

Priority 1

JCWA will request funding to do stabilization along 450 feet of a UNT. In addition to the stabilization, a vegetative buffer will be created for 2,610 feet of the channel. Once complete, the project will result in the removal of 58 thousand pounds of sediment annually.

Funding:

EPA 319 – $27,900.00 for design and construction

JCWA and NRCS – Project management and additional funding

Timeline – Funding will be requested once agreements are in place with property owner

Site #10 Farm

Priority 1

JCWA will request funding to do stabilization along 140 feet of a UNT. In addition to the stabilization, a vegetative buffer will be created for 2,410 feet of the channel. Better land management practices, such as residue farming, will also be proposed for implementation on the property. Once complete, the project will result in the removal of 63 thousand pounds of sediment annually.

Funding:

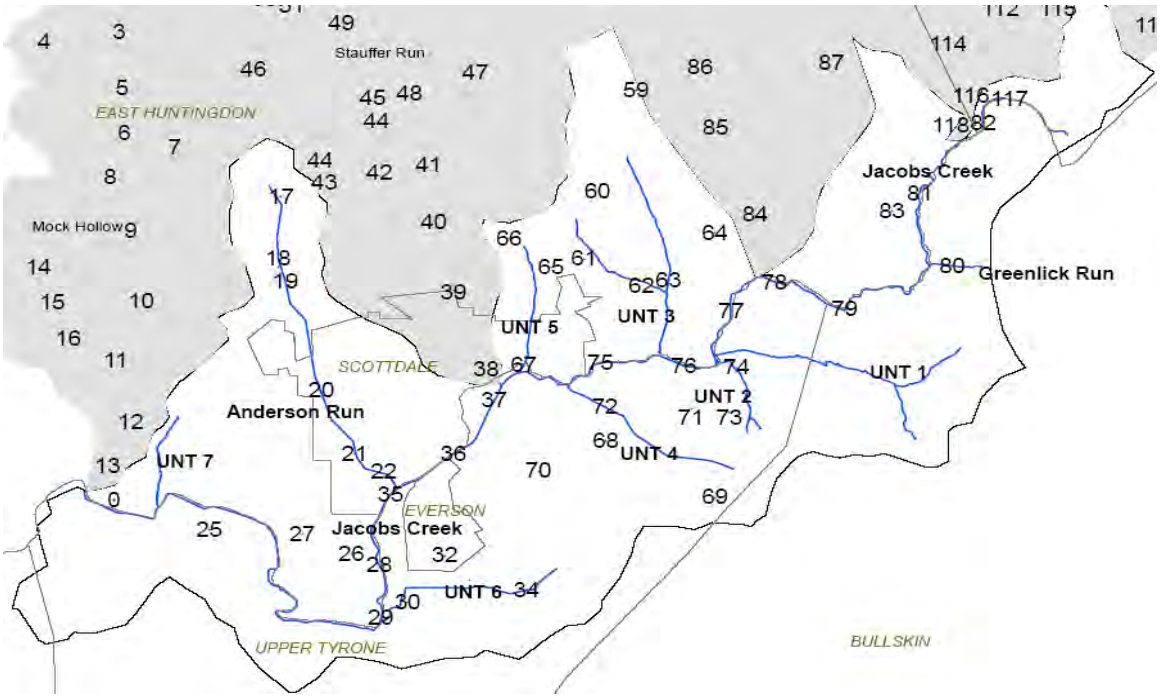
EPA 319 – $27,986.00 for design and construction

JCWA, Westmoreland Conservation District and NRCS – Project management and additional funding

Timeline **–** Funding will be requested once agreements are in place with property owner

Completion of the three Priority 1 projects and one Priority 2 project will result in the removal of over 205 thousand pounds, or approximately 28% of the total sediment annually from the Mock Hollow Watershed. The remaining projects will result in the removal of 189 thousand pounds of sediment, or an additional 22% annually. Once all proposed projects are complete, sediment will be reduced by 47%, total nitrogen by 35% and phosphorous by 77%. It is anticipated that all Priority 1 and 2 projects will be implemented within the next 7 years and completed by 2017. The remaining projects will be constructed as funding and opportunities become available.

Jacobs Creek Watershed (including UNTs 1-7, Anderson Run and Greenlick Run)



Site #0: Channel Clearing (Jacobs Creek) (Priority 1)

- Remove debris and trees blocking channel from Mt. Pleasant to Scottdale

Site #17: Farm (Anderson Run) (Priority 1)

- Contour Farming 50 acres
- Vegetative Buffer 1220LF
- Streambank Stabilization 410LF

Site #18: Several (Anderson Run) (Priority 4)

- Vegetative Buffer 690LF
- Streambank Stabilization 220LF

Site #19: Hilltop Animals (Anderson Run) (Priority 4)

- Vegetative Buffer 1380LF
- Streambank Stabilization 470LF

- Site #20: Several (Anderson Run) (Priority 3)
- Vegetative Buffer 1120LF
- Streambank Stabilization 320LF

Site #21: Several (Anderson Run) (Priority 3)

- Vegetative Buffer 750LF
- Streambank Stabilization 290LF

Site #22: Several (Anderson Run) (Priority 3)

- Vegetative Buffer 1150LF
- Streambank Stabilization 210LF

Site #23: Farm (UNT 7) (Priority 3)

- Contour/Strip Farming 130 acres
- Vegetative Buffer 1970LF
- Streambank Stabilization 410LF

Site #24: Farm (Jacobs Creek) (Priority 4)

- Vegetative Buffer 1930LF
- Streambank Stabilization 330LF

Site #25: Fayette County Side (Jacobs Creek) (Priority 3)

- Vegetative Buffer 3070LF
- Streambank Stabilization 490LF

Site #26: Farm (Jacobs Creek) (Priority 3)

- Feedlot Runoff 50 acres

Site #27: RTK Inc. (Jacobs Creek)

- Strip Farming 40 acres
- Contour Farming 40 acres

Site #28: Broadford Road (Priority 1)

- Vegetative Buffer 2720LF
- Streambank Stabilization 510LF

Site #29: Fayette County Side (UNT 6) (Priority 4)

- Vegetative Buffer 800LF
- Streambank Stabilization 400LF

Site #30-33: Railroad Property (UNT 6) (Priority 2)

- Vegetative Buffer 2670LF
- Stream is Ditched

Site #34: Everson Road to Penn Ave. (UNT 6) (Priority 3)

- Vegetative Buffer 480LF

Site #35: 5th Ave. to Brown St. (Jacobs Creek) (Priority 2)

- Vegetative Buffer 1510 LF

Site #36: Brown St. to Kingview (Jacobs Creek) (Priority 2)

- Vegetative Buffer 2680 LF

Site #37: Kingview to Stauffer Run (Jacobs Cr) (Priority 2)

- Vegetative Buffer 970 LF

Site #59: Farm (UNT 3) (Priority 4)

- Runoff Controls 100 Acres

Site #60: Farm (UNT 3) (Priority 3)

- Vegetative Buffer 1090LF
- Runoff Controls 100 Acres
- Streambank Stabilization 190LF

Site #61: Fort Allen Farm Equip (UNT 2) (Priority 2)

- Vegetative Buffer 970 LF
- Streambank Stabilization 310LF

Site #62: Several (UNT 3) (Priority 3)

- Stabilize 220 LF
- Vegetative Buffer 910 LF

Site #63: Several (UNT 3) (Priority 3)

- Stabilize 260LF
- Vegetative Buffer 1090 LF

Site #64: Farm (UNT 3) (Priority 3)

- Runoff Controls for 100 Acres of Ag.

Site #65: Farm (UNT 5) (Priority 1)

- Vegetative Buffer 2020LF
- Stabilize 510LF

Site #66: Farm (UNT 5) (Priority 3)

- Vegetative Buffer 510LF
- Streambank Stabilization 230LF
- Controls for 100 Acres of Ag.

Site #67: unknown (UNT 5) (Priority 3)

- Vegetative Buffer 530LF
- Streambank Stabilization 130LF

Site #68: Fayette County Farm (UNT 4) (Priority 3)

- Contour/Strip Farming 60 acres

Site #69: Fayette County Farm (UNT 4) (Priority 3)

- Runoff Controls for 100 Acres of Ag.
- Streambank Stabilization 100LF

Site #70: Fayette Farm (Jacobs Creek) (Priority 4)

- Runoff Controls for 100 Acres of Ag.

Site #71 Fayette County Farm (UNT 4) (Priority 4)

- Runoff Controls for 100 Acres of Ag.

Site #72: Fayette Property (UNT 4) (Priority 3)

- Vegetative Buffer 810LF
- Streambank Stabilization 310LF

Site #73: Fayette County Farm (UNT 2) (Priority 4)

- Runoff Controls for 100 Acres of Ag.

Site #74: Fayette Property (UNT 2) (Priority 3)

- Vegetative Buffer 560LF

Site #75: Scottdale Borough (Jacobs Creek) (Priority 3)

- Vegetative Buffer 810LF

Site #76: UNT 4 to UNT 2 (Jacobs Creek) (Priority 2)

- Stabilize 1810LF
- Channel Cleaning

Site #77: UNT 1 to Sherrick Run (Jacobs Creek) (Priority 2)

- Stabilize 1760LF
- Channel Cleaning

Site #78: Sherrick Run to Mt. Pleasant Road (Jacobs Creek) (Priority 2)

- Stabilize 780LF
- Channel Cleaning

Site #79: Mt Pleasant Road to Greenlick Run (Jacobs Creek) (Priority 2)

- Stabilize 2100LF
- Channel Cleaning

Site #80: Greenlick Run Farm (Greenlick Run) (Priority 1)

- Stabilize 1120LF

Site #81: Greenlick Run to Shupe Run (Jacobs Creek) (Priority 2)

- Stabilize 1210LF
- Channel Cleaning

Site #82: Shupe Run to Bridgeport Dam (Jacobs Creek) (Priority 3)

- Stabilize 710LF
- Channel Cleaning

Site #83: unknown (Jacobs Creek) (Priority 3)

- Contour/Strip Farming 30 acres

Site #0 Jacobs Creek Channel Blockage Clearing (Jacobs Creek)

Priority 1

During the site assessment phase of the implementation plan development, the Jacobs Creek stream channel was walked from Bridgeport to Scottdale. Jacobs Creek lacked significant flow throughout the study area with sediment deposits up to several feet in some areas. One of the causes of this condition was that several large trees had fallen across the channel collecting debris and blocking stream flows. Flooding of the channel during storm events had greatly increased the width of the stream with no apparent low flow channel.

A grant request will be submitted in the spring of 2009 to perform channel cleaning and tree removal for Jacobs Creek. This will relieve the backwater conditions so the stream can be re-walked and areas which require bank stabilization can be more accurately assessed. Future funding will be pursued to construct streambank stabilization and natural stream channel design concepts such as root wads, rock cross vanes and log vanes.

Jacobs Creek Channel Clearing Funding:

EPA 319 – $25,000 to hire a tree removal company to clear channel

JCWA – Project Management

Timeline – Complete work summer 2010

Site #17 Farm (Anderson Run)

Priority 1

JCWA will request funding to do stabilization along 410 feet of Anderson Run. In addition to the stabilization, a vegetative buffer will be created for 1,220 feet of the channel. Better land management practices, such as contour and residue farming, will also be proposed for implementation on the property. Once complete, the project will result in the removal of 31 thousand pounds of sediment annually.

Farm Funding:

EPA 319 – $55,200.00 for design and construction

JCWA,Westmoreland Conservation District and NRCS **–** Project management and additional funding

Timeline **–** Funding will be requested once agreements are in place with property owner

Site #28 Properties along SR 1031 (Broadford Road)

Priority 1

JCWA will request funding to do stabilization along 510 feet of Jacobs Creek that flows behind several residential properties in Upper Tyrone Township. In addition to the stabilization, a vegetative buffer will be created for 2,720 feet of the channel which is currently being mowed by the property owners. Once complete, the project will result in the removal of 13 thousand pounds of sediment annually.

Properties along SR 1031 Funding:

EPA 319 – $28,200.00 for design and construction

JCWA – Project management and additional funding

Timeline – Funding will be requested once agreements are in place with property owner

Site #30-33 Properties along Railroad in Everson (UNT 6)

Priority 2

JCWA will request funding to do stabilization along 2,670 feet of UNT 6 that is located in Everson. In addition to the stabilization, a vegetative buffer will be created along the channel. The channel is currently ditched through several residential properties along the railroad ROW and is eroding severely. Once complete, the project will result in the removal of 17 thousand pounds of sediment annually.

Properties along Railroad in Everson Funding:

EPA 319 – $133,500.00 for design and construction

JCWA and Fayette County Conservation District– Project management and additional funding

Timeline – Funding will be requested once agreements are in place with property owner

Site #35-37 Vegetative Buffer along Jacobs Creek Flood Control Project

Priority 2

JCWA will request funding to do vegetative buffer along 5,100 feet of Jacobs Creek that is located in Scottdale. The project is located along the flood control project from Stauffer Run to Everson. Once complete, the project will result in the removal of 17 thousand pounds of sediment annually. In addition, the vegetation will provide shade to help reduce thermal impacts to the stream and create habitat.

Vegetative Buffer along Jacobs Creek Funding:

EPA 319 – $10,000.00 for design and construction

JCWA and Scottdale Borough– Project management and additional funding, plantings installation

Timeline – Funding will be requested once agreements are in place with property owner

Site #61 Fort Allen Farm Equipment Project

Priority 2

JCWA will request funding to do stabilization along 310 feet of UNT 3. In addition to the stabilization, a vegetative buffer will be created for 970 feet of the channel. The property is currently being utilized for hey production; better land management practices, such as

contour farming, will also be proposed for implementation on the property. Once complete, the project will result in the removal of 21 thousand pounds of sediment annually.

Fort Allen Farm Equipment Funding:

EPA 319 - $28,200.00 for design and construction

JCWA **–** Project management and additional funding

Timeline **–** Funding will be requested once agreements are in place with property owner

Site #65 Farm Project

Priority 1

JCWA will request funding to do stabilization along 510 feet of UNT 3. In addition to the stabilization, a vegetative buffer will be created for 2,020 feet of the channel. The farm is currently being utilized for crop production; better land management practices, such as contour and strip farming, will also be proposed for implementation on the property. Once complete, the project will result in the removal of 48 thousand pounds of sediment annually.

Funding:

EPA 319 – $61,344.00 for design and construction

JCWA **–** Project management and additional funding

Timeline **–** Funding will be requested once agreements are in place with property owner

Site #80 Greenlick Run Farm Project

Priority 1

JCWA will request funding to do stabilization along 1,120 feet of Greenlick Run. The Fayette County Conservation District and NRCS have completed several projects on the property and this project will complete the stabilization of Greenlick Run. Once complete, the project will result in the removal of 15 thousand pounds of sediment annually.

Greenlick Run Farm Funding:

EPA 319 – $79,200.00 for design and construction

JCWA **–** Project management and additional funding

Timeline **–** Funding will be requested once agreements are in place with property owner

Site #76-79 and 81 Jacobs Creek Stabilization Project

Priority 2

JCWA will request funding to do stabilization along 7,660 feet of Jacobs Creek between Bridgeport and Scottdale. The banks of Jacobs Creek are severely eroded throughout this area and funding will be requested as property agreements and access is obtained. Once complete, the project will result in the removal of 70 thousand pounds of sediment annually.

Funding:

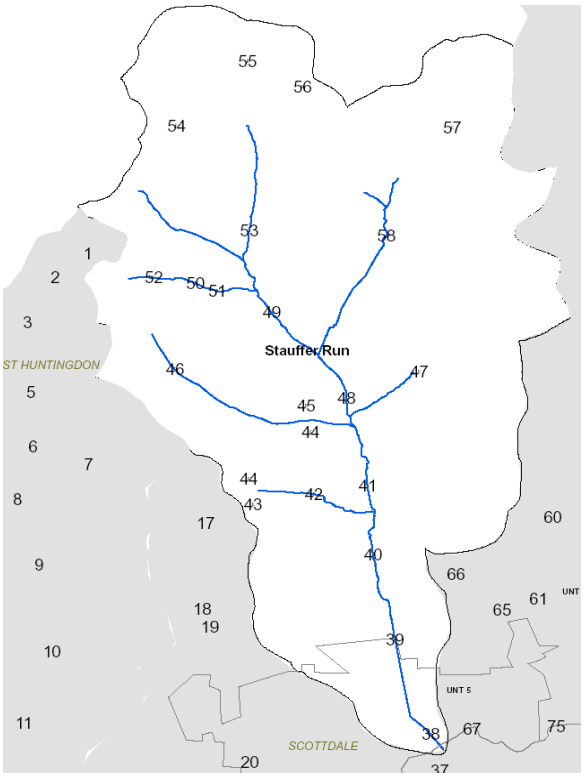
EPA 319 – $396,000.00 for design and construction

JCWA **–** Project management and additional funding

Timeline **–** Funding will be requested once agreements are in place with property owners

Completion of the six Priority 1 projects and three Priority 2 projects will result in the removal of over 232 thousand pounds, or approximately 10% of the total sediment annually from the Jacobs Creek Watershed. The remaining projects will result in the removal of 30 thousand pounds of sediment, or an additional 3% annually. Once all proposed projects are complete, sediment will be reduced by 13%, total nitrogen by 7% and phosphorous by 32%. It is anticipated that all Priority 1 and 2 projects will be implemented within the next 7 years and completed by 2017. The remaining projects will be constructed as funding and opportunities become available.

Stauffer Run Watershed



Site #38: Jacobs Cr. to SR 819 (Priority 3)

- Vegetative Buffer 2310LF

Site #39: SR819 to End of Flood Control (Priority 4)

- Vegetative Buffer 970LF

Site #40: Rent a Center to Hawkeye (Priority 3)

- Vegetative Buffer 1470LF
- Streambank Stabilization 460LF

Site #41: Along Railroad ROW (Priority 3)

- Vegetative Buffer 1470LF
- Streambank Stabilization 670LF

Site #42: Farm (Priority 1)

- Vegetative Buffer 2470LF
- Streambank Stabilization 580LF

Site #43: Poorbaugh Farm (Priority 4)

- Contour/Strip Farming 50 acres

Site #44: Gaut Farm (Priority 1)

- Contour/Strip Farming 180 acres
- Vegetative Buffer 3780LF
- Streambank Stabilization 1370LF

Site #45: Farm (Priority 1)

- Vegetative Buffer 4120LF
- Contour/Strip Farming 100 acres
- Streambank Stabilization 760LF

Site #46: Farm (Priority 3)

- Vegetative Buffer 1610LF
- Contour/Strip Farming 50 acres
- Streambank Stabilization 310LF

Site #47: Greenridge LLC (Priority 3)

- Landfill 300 acres

Site #48: unkown (Priority 4)

- Vegetative Buffer 970LF
- Streambank Stabilization 120LF

Site #49: Several (Priority 4)

- Vegetative Buffer 1690LF
- Streambank Stabilization 310LF

Site #50: Farm (Priority 4)

- Vegetative Buffer 320LF

Site #51: Farm (Priority 3)

- Vegetative Buffer 1190LF
- Contour/Strip Farming 20 acres
- Streambank Stabilization 210LF

Site #52: Farm (Priority 3)

- Vegetative Buffer 1260LF
- Contour/Strip Farming 60 acres
- Streambank Stabilization 210LF

Site #53: East Huntingdon Gun Club (Priority 1)

- Vegetative Buffer 2060 LF
- Streambank Stabilization 520LF

Site #54: Farm (Priority 4)

- Pasture Runoff Controls 130 Acres

Site #55: Farm (Priority 4)

- Runoff Controls for 150 Acres of Ag.

Site #56: Farm (Priority 4)

- Runoff Controls for 150 Acres of Ag.

Site #57: Farm (Priority 4)

- Runoff Controls for 120 Acres of Ag.

Site #58: Town of Alveton (Priority 3)

- Vegetative Buffer 1990LF
- Streambank Stabilization 720LF

Site #42 Farm Project

Priority 1

JCWA will request funding to do stabilization along 580 feet of a UNT to Stauffer Run. In addition to the stabilization, a vegetative buffer will be created for 2,470 feet of the channel. The farm is currently being utilized for crop production; better land management practices, such as contour farming, will also be proposed for implementation on the property. Once complete, the project will result in the removal of 63 thousand pounds of sediment annually.

Funding:

EPA 319 – $27,900.00 for design and construction

JCWA **–** Project management and additional funding

Timeline **–** Funding will be requested once agreements are in place with the property owner

Site #44 Farm Project

Priority 1

JCWA will request funding to do stabilization along 1,370 feet of the UNT. In addition to the stabilization, a vegetative buffer will be created for 3,780 feet of the channel. Better land management practices such as contour/strip farming will also be implemented on the property. Once complete, the project will result in the removal of 101 thousand pounds of sediment annually.

Funding:

EPA 319 – $81,631.00 for design and construction

JCWA **–** Project management and additional funding

Timeline **–** Funding will be requested once agreements are in place with property owner

Site #45 Farm Project

Priority 1

JCWA will request funding to do stabilization along 760 feet of a UNT to Stauffer Run. In addition to the stabilization, a vegetative buffer will be created for 4,120 feet of the channel. Better land management practices, such as contour farming, will also be proposed for implementation on the property. Once complete, the project will result in the removal of 112 thousand pounds of sediment annually.

Funding:

EPA 319 – $55,531.00 for design and construction

JCWA **–** Project management and additional funding

Timeline **–** Funding will be requested once agreements are in place with property owner

Site #53 East Huntingdon Gun Club Project

Priority 1

The property is currently being utilized by a gun club for trap shooting and a gun range. JCWA will request funding to do stabilization along 520 feet of Stauffer Run. In addition to the stabilization, a vegetative buffer will be created for 2,060 feet of the channel. Once complete, the project will result in the removal of 52 thousand pounds of sediment annually.

East Huntingdon Gun Club Funding:

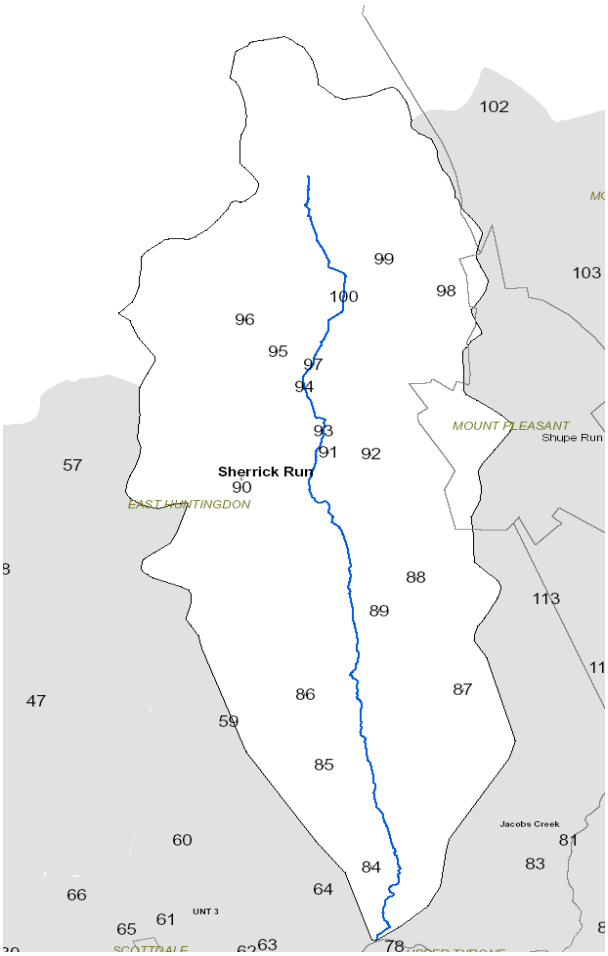
EPA 319 – $54,000.00 for design and construction

JCWA **–** Project management and additional funding

Timeline **–** Funding will be requested once agreements are in place with property owner

Completion of the four Priority 1 projects will result in the removal of over 328 thousand pounds, or approximately 18% of the total sediment annually from the Stauffer Run Watershed. The remaining projects will result in the removal of 173 thousand pounds of sediment, or an additional 8% annually. Once all proposed projects are complete, sediment will be reduced by 27%, total nitrogen by 18% and phosphorous by 45%. It is anticipated that all Priority 1 and 2 projects will be implemented within the next 7 years and completed by 2017. The remaining projects will be constructed as funding and opportunities become available.

Sherrick Run Watershed



Site #84: Farm (Priority 1)
- Streambank Stabilize 2110LF
- Contour farm 50 acres
- Vegetative Buffer 2090 LF

Site #85: Smouse (Priority 3)
- Runoff Controls 170 acres

Site #86: Farm (Priority 3)
- fencing 1500 LF

Site #87: Farm (Priority 1)
- Streambank Stabilize 970LF
- Contour farm 50 acres
- Vegetative Buffer 1100 LF
- Treat runoff 50 acres

Site #88: Farm (Priority 2)
- Streambank Stabilize 2110LF
- Vegetative Buffer 2330 LF

Site #89: unknown (Priority 3)
- Treat runoff 10 Acres

Site #90: Farm (Priority 1)
- Streambank Stabilize 1970LF
- Pasture runoff 250 acres
- Vegetative Buffer 2360 LF
- Fencing 3000 LF

Site #91: Valley Kitchen Road (Priority 3)
- Streambank Stabilize 980 LF
- Vegetative Buffer 1120 LF

Site #92: Several (Priority 3)
- Streambank Stabilize 2000 LF
- Vegetative Buffer 2000 LF

Site #93: Valley Kitchen Road (Priority 3)
- Streambank Stabilize 1480 LF
- Vegetative Buffer 1510 LF

Site #94: Valley Kitchen (Priority 3)
- Streambank Stabilize 1390 LF
- Vegetative Buffer 1620 LF

Site #95: Kings Point (Priority 4)
- Streambank Stabilize 1790 LF
- Vegetative Buffer 3210 LF

Site #96: Unknown (Priority 4)
- Streambank Stabilize380 LF
- Vegetative Buffer 750 LF

Site #97: Mini Storage (Priority 3)
- Streambank Stabilize 300 LF
- Vegetative Buffer 300 LF

Site #98: Farm (Priority 4)
- Pasture Runoff 50 Acres

Site #99: Farm (Priority 4)
- Pasture and Crop Runoff 250 Acres

Site #100: Unkown (Priority 3)
- Remove 1000 LF of concrete lining

Site #84 Farm Project

Priority 1

JCWA will request funding to do stabilization along 2,110 feet of Sherrick Run. In addition to the stabilization, a vegetative buffer will be created for 2,090 feet of the channels. Better land management practices, such as contour farming, will also be proposed for implementation on the property. Once complete, the project will result in the removal of 86 thousand pounds of sediment annually.

Funding:

EPA 319 – $106,800.00 for design and construction

JCWA **–** Project management and additional funding

Timeline **–** Funding will be requested once agreements are in place with property owner

Site #87 Farm Project

Priority 1

JCWA will request funding to do stabilization along 970 feet of a UNT and Sherrick Run. In addition to the stabilization, a vegetative buffer will be created for 1,100 feet of the channels. Better land management practices will also be proposed for implementation on the property. Once complete, the project will result in the removal of 50 thousand pounds of sediment annually.

Funding:

EPA 319 – $59,400.00 for design and construction

JCWA **–** Project management and additional funding

Timeline **–** Funding will be requested once agreements are in place with property owner

Site #88 Farm Project

Priority 2

JCWA will request funding to do stabilization along 2,110 feet of a UNT to Sherrick Run. In addition to the stabilization, a vegetative buffer will be created for 2,230 feet of the channel. Better land management practices, such as contour farming, will also be proposed for implementation on the property. Once complete, the project will result in the removal of 86 thousand pounds of sediment annually.

Funding:

EPA 319 – $53,400.00 for design and construction

JCWA **–** Project management and additional funding

Timeline **–** Funding will be requested once agreements are in place with property owner

Site #90 Farm Project

Priority 1

JCWA will request funding to do stabilization along 1,970 feet of a UNT to Sherrick Run. In addition to the stabilization, a vegetative buffer will be created for 2,360 feet of the channel. Fencing will be installed for 1,000 feet of channel that has been impacted by livestock. Better land management practices will also be implemented on the property. Once complete, the project will result in the removal of 130 thousand pounds of sediment annually.

Funding:

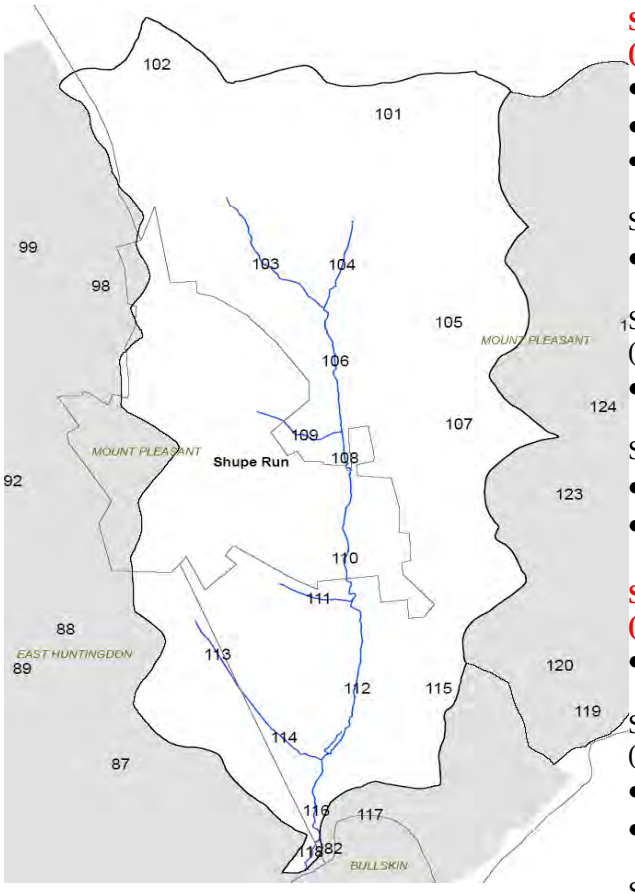
EPA 319 – $116,400.00 for design and construction

JCWA **–** Project management and additional funding

Timeline **–** Funding will be requested once agreements are in place with property owner

Completion of the three Priority 1 projects and one Priority 2 project will result in the removal of over 352 thousand pounds, or approximately 20% of the total sediment annually from the Stauffer Run Watershed. The remaining projects will result in the removal of 103 thousand pounds of sediment, or an additional 6% annually. Once all proposed projects are complete, sediment will be reduced by 26%, total nitrogen by 17% and phosphorous by 33%. It is anticipated that all Priority 1 and 2 projects will be implemented within the next 7 years and completed by 2017. The remaining projects will be constructed as funding and opportunities become available.

Shupe Run Watershed



Site #101: Bullock Farm (Priority 4)

- Runoff Controls 150 Acres

Site #102: Schilling Farm (Priority 4)

- Runoff Control 150 Acres

Site #103: SR 0819 to State Road (Priority 2)

- Vegetative Buffer 3070LF
- Streambank Stabilization 1110LF

Site #104: Mt. Pleasant High School to State Road (Priority 3)

- Vegetative Buffer 1970LF
- Streambank Stabilization 270LF

Site #105: Unknown Owner Farm (Priority 4)

- Contour Farming 70 acres

Site #106: State Road to Slope Hill Road (Priority 2)

- Vegetative Buffer 2510LF
- Streambank Stabilization 1190LF
- Sewage for approx. 50 households

Site #107:Unkown (Priority 4)

- Contour Farming 100 acres

Site #108: Slope Hill Road to Main Street (Priority 4)

- Streambank Stabilization 960LF

Site #109: Residential Area (Priority 3)

- Vegetative Buffer 1060LF
- Streambank Stabilization 760LF

Site #110: Main Street to Willow Park (Priority 1)

- Streambank Stabilization 1870LF

Site #111: Residential Area above Willow Park (Priority 3)

- Vegetative Buffer 980LF
- Streambank Stabilization 870LF

Site #112: Willow Park to Bridgeport (Priority 3)

- Streambank Stabilization 1360LF

Site #113: Glick Bros. Farm (Priority 1)

- Vegetative Buffer 1980LF
- Streambank Stabilization 770LF
- Contour Farming 250 Acres

Site #114: Detling Farm (Priority 3)

- Vegetative Buffer 800LF
- Streambank Stabilization 200LF

Site #115: Shutty Property (Priority 4)

- Runoff Controls 100 Acres

Site #116 and #118: Bridgeport to Jacobs Creek (Priority 4)

- Streambank Stabilization 1210 LF

Site #117: Bridgeport Sportsmens Club (Priority 4)

- Remove old concrete dam

Site #103 SR 819 Stream Stabilization Project

Priority 2

JCWA will request funding to do stabilization along 1,110 feet of Shupe Run that runs along SR 819. In addition to the stabilization, a vegetative buffer will be created for 3070 feet of the channel. Once complete, the project will result in the removal of 50 thousand pounds of sediment annually.

SR 0819 Stream Stabilization Project Funding:

EPA 319 – **$**160,200.00 for design and construction

Mt. Pleasant Township/JCWA – Project management

Timeline – Due to the amount of property owner consents needed to complete the project, it is anticipated that several years will be required before funding is requested

Site #106 Slope Hill Road Sewage and Stream Stabilization Project

Priority 2

JCWA will request funding to do stabilization along 1,190 feet of Shupe Run that runs along SR 819. In addition to the stabilization, a vegetative buffer will be created for 2,510 feet of the channel. Sewage is also needed for approximately 50 residential properties located along the stream which currently are on private systems. Once complete, the project will result in the removal of 36 thousand pounds of sediment annually. In addition, 29% of the organics/month will be removed.

Slope Hill Road Sewage and Stream Stabilization Project Funding:

EPA 319 – **$**133,500.00 for design and construction (additional funding needed for sewage upgrades)

Mt. Pleasant Township/JCWA – Project management

Timeline – Due to the amount of property owner consents needed to complete the project, it is anticipated that several years will be required before funding is requested

Site #110 Willow Park Stabilization

Priority 1

Phase I

The Westmoreland Conservation District received a grant in 2007 through Growing Greener to perform channel stabilization on 400 feet of Shupe Run in Mt. Pleasant Park. A portion of the channel along the soccer fields was stabilized with Rip Rap.

Phase II

JCWA and Westmoreland Conservation District will request additional funding in the spring of 2009 to do additional stabilization along 2000 feet of channel from the old factory building to the soccer fields and from the end of the Phase I Project to the water treatment plant. A small UNT which receives stormwater from a heavily developed residential area enters Shupe Run at this location and is causing severe erosion along the streambanks. Once complete, the project will result in the removal of 33 thousand pounds of sediment annually.

Willow Park Stabilization Funding:

Phase I

Growing Greener – $15,300.00

Westmoreland Conservation District – Project management

Phase II

EPA 319 – $106,000.00 for design and construction

Westmoreland Conservation District – Project management

Timeline: Phase I - Complete work summer 2008; Phase II – Complete work summer 2010

Site #113 Farm

Priority 1

JCWA will request funding to do stabilization along 770 feet of a UNT to Shupe Run. In addition to the stabilization, a vegetative buffer will be created for 1,980 feet of the channel. Better land management practices, such as contour farming, will also be proposed for implementation on the property. Once complete, the project will result in the removal of 173 thousand pounds of sediment annually.

Funding:

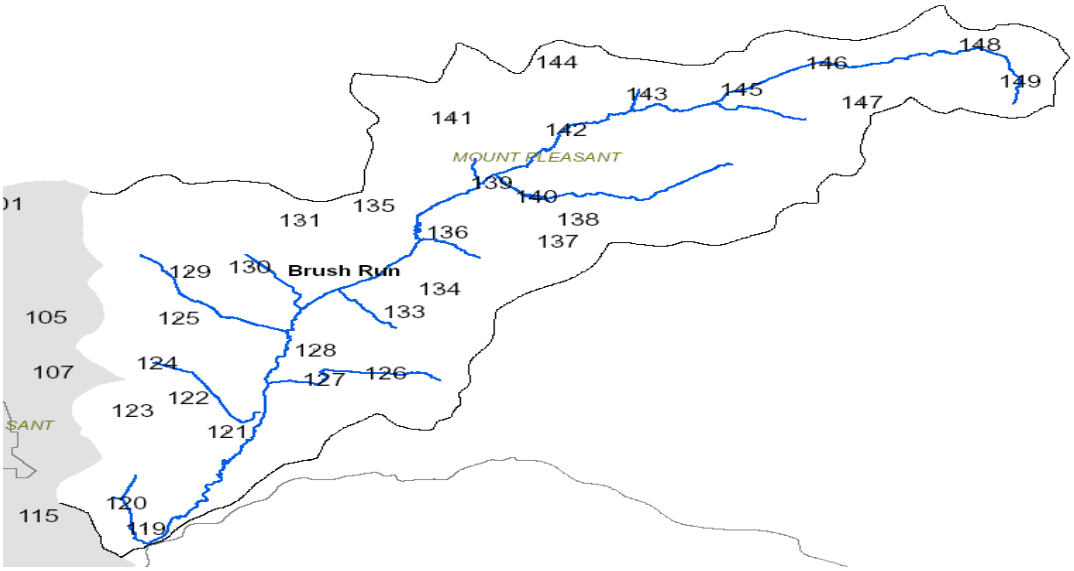
EPA 319 – $60,856.00 for design and construction

Westmoreland Conservation District and NRCS **–** Project management and additional funding

Timeline **–** Funding will be requested once agreements are in place with property owner

Completion of the two Priority 1 projects and two Priority 2 projects will result in the removal of over 292 thousand pounds, or approximately 26% of the total sediment annually from the Shupe Run Watershed. The remaining projects will result in the removal of 15 thousand pounds of sediment, or an additional 1% annually. Once all proposed projects are complete, sediment will be reduced by 27%, total nitrogen by 7% and phosphorous by 26%. It is anticipated that all Priority 1 and 2 projects will be implemented within the next 7 years and completed by 2017. The remaining projects will be constructed as funding and opportunities become available.

Brush Run Watershed



Site #119: Farm (Priority 3)

- Vegetative Buffer 1300LF
- Streambank Stabilization 970LF
- Contour Farm 50 Acres

Site #120: Several (Priority 3)

- Vegetative Buffer 1880LF
- Streambank Stabilization 1510LF

Site #121: Westmoreland RGR (Priority 4)

- Treat runoff 100 acres
-

Site #122: Farm (Priority 2)

- Vegetative Buffer 1120LF
- Streambank Stabilization 910LF
- Pasture and Crop Runoff 120 Acres

Site #123: Property (Priority 4)

- Pasture and Crop Runoff 120 Acres

Site #124: Property (Priority 4)

- Vegetative Buffer 1210LF
- Streambank Stabilization 510LF
- Pasture and Crop Runoff 50 Acres

Site #125: Laurel Highlands Meadows (Priority 4)

- Vegetative Buffer 970LF
- Streambank Stabilization 500LF

Site #126: Several S. of Polecat Rd. (Priority 4)

- Vegetative Buffer 1090LF
- Streambank Stabilization 310LF

Site #127: Several (E. of Mt. Joy Rd) (Priority 4)

- Vegetative Buffer 1190LF
- Streambank Stabilization 390LF

Site #128: Farm (Priority 4)

- Runoff 50 acres

Site #129: Farm (Priority 4)

- Contour farming 20 acres
- Streambank Stabilization 610LF

Site #130: Farm (Priority 4)

- Pasture and Crop runoff 70 acres
- Streambank Stabilization 370LF
- Vegetative Buffer 970LF

Site #131: Farm (Priority 4)

- Pasture and Crop runoff 130 acres

Site #132: Carpernertown Rd to Turnpike (Priority 3)

- Streambank Stabilization 2120LF
- Vegetative Buffer 3110LF

Site #133: Property (Priority 3)

- Streambank Stabilization 470LF
- Vegetative Buffer 1090LF
- Pasture and Crop runoff 20 acres

Site #134: Farm (Priority 4)

- Pasture and Crop runoff 100 acres

Site #135: Farm (Priority 1)

- Pasture and Crop runoff 300 acres
- Vegetative Buffer 1210LF
- Streambank Stabilization 510LF

Site #136: Farm (Priority 1)

- Streambank Stabilization 2020LF
- Vegetative Buffer 2990LF
- Fencing 3000LF
- Strip Crop 130 acres

Site #137: Property (Priority 4)

- Pasture and Crop runoff 40 acres

Site #138: Property (Priority 4)

- Pasture and Crop runoff 30 acres

Site #139: Farm (Priority 4)

- Vegetative Buffer 1160LF
- Streambank Stabilization 530LF
- Contour farm 70 Acres

Site #140: Property (Priority 4)

- Vegetative Buffer 800LF
- Streambank Stabilization 710LF

Site #141: Farm (Priority 4)

- Contour farm 100 Acres
- Pasture and Crop Runoff 100 Acres

Site #142 and 143: Farm (Priority 1)

- Barnyard runoff
- Pasture and Crop Runoff 500 Acres
- Streambank Stabilization 4010LF
- Vegetative Buffer 5060LF

Site #144: Farm (Priority 4)

- Pasture and Crop Runoff 80 Acres

Site #145: Town of Kecksburg (Priority 4)

- Streambank Stabilization 290LF
- Vegetative Buffer 1010LF

Site #146: Farm (Priority 3)

- Pasture and Crop Runoff 70 Acres
- Streambank Stabilization 760LF
- Vegetative Buffer 800LF

Site #147: Farm (Priority 4)

- Pasture and Crop Runoff 50 Acres

Site #148: Farm (Priority 3)

- Pasture and Crop Runoff 100 Acres
- Streambank Stabilization 690LF
- Vegetative Buffer 700LF

Site #149: Farm (Priority 3)

- Pasture and Crop Runoff 50 Acres
- Streambank Stabilization 360LF
- Vegetative Buffer 500LF

Site #122 Farm

Priority 2

JCWA will request funding to do stabilization along 910 feet of a UNT to Brush Run. In addition to the stabilization, a vegetative buffer will be created for 1,120 feet of the channel. Better land management practices, such as contour farming, will also be proposed for implementation on the property. Once complete, the project will result in the removal of 14 thousand pounds of sediment annually.

Funding:

EPA 319 – $63,206.00 for design and construction

Westmoreland Conservation District and NRCS – Project management and additional funding

Timeline – Funding will be requested once agreements are in place with property owner

Site #135 Farm

Priority 1

JCWA will request funding to do stabilization along 510 feet of Brush Run. In addition to the stabilization, a vegetative buffer will be created for 1,510 feet of the channel. Better land management practices, such as contour farming, will also be proposed for implementation on the property. Once complete, the project will result in the removal of 13 thousand pounds of sediment annually.

Funding:

EPA 319 – $36,806.00 for design and construction

Westmoreland Conservation District and NRCS – Project management and additional funding

Timeline – Funding will be requested once agreements are in place with property owner

Site #136 Farm

Priority 1

JCWA will request funding to do stabilization along 2,020 feet of Brush Run. In addition to the stabilization, a vegetative buffer will be created for 2,990 feet of the channel. Better land management practices such as contour farming and stream fencing will also be implemented on the property. Once complete, the project will result in the removal of 28 thousand pounds of sediment annually.

Funding:

EPA 319 – $84,506.00 for design and construction

Westmoreland Conservation District and NRCS – Project management and additional funding

Timeline – Funding will be requested once agreements are in place with property owner

Site #142 - 143 Farm

Priority 1

JCWA will request funding to do stabilization along 4,010 feet of Brush Run. In addition to the stabilization, a vegetative buffer will be created for 5,060 feet of the channel. Better land management practices such as contour farming, stream fencing and feed lot runoff will be implemented on the property. Once complete, the project will result in the removal of 67 thousand pounds of sediment annually.

Funding:

EPA 319 – $183,582.00 for design and construction

Westmoreland Conservation District and NRCS **–** Project management and additional funding

Timeline **–** Funding will be requested once agreements are in place with property owner

Completion of the three Priority 1 projects and one Priority 2 project will result in the removal of over 122 thousand pounds, or approximately 8% of the total sediment annually from the Brush Run Watershed. The remaining projects will result in the removal of 232 thousand pounds of sediment, or an additional 14% annually. Once all proposed projects are complete, sediment will be reduced by 22%, total nitrogen by 26% and phosphorous by 48%. It is anticipated that all Priority 1 and 2 projects will be implemented within the next 7 years and completed by 2017. The remaining projects will be constructed as funding and opportunities become available.

11.2 Abandoned Mine Drainage Projects

Abandoned mine drainage (AMD) was identified as a major cause of impairment during the 2002 assessment performed by the PA DEP as part of the 303(d) list assessment. During the field reconnaissance that was performed during the development of this implementation plan. Several AMD discharges or other AMD contributing sources were identified. The impacted sub-watersheds include Stauffer Run, Sherrick Run, Shupe Run, Brush Run, UNT 2, UNT 6, Greenlick Run, and Jacobs Creek. Some of the discharges were known to exist and several have been or are currently being monitored.

Four discharges were identified near the headwaters of the Stauffer Run Sub-watershed and are currently being investigated. Two discharges were identified along Sherrick Run near SR 119 and a large area of mine spoil was deposited along Sherrick Run in the floodplain near Quarry Street. Two discharges were identified along Shupe Run near Bridgeport and a large spoil pile is also located in the Shupe Run watershed. The Brush Run sub watershed has a discharge near the Bridgeport Dam and a large spoil pile area about 1 mile upstream of Bridgeport. UNT 2 has a discharge at it's headwaters near Mt. Carmel Church and UNT 6 has a discharge below Everson. There is one discharge below the Bridgeport Sportsmen's Club that enters into the main branch of Jacobs Creek. There is evidence of AMD impacts at the outlet of the Greenlick Run Reservoir in Greenlick Run also.

A preliminary study was performed on one of the Sherrick Run discharges and one of the Shupe Run discharges through a grant sponsored by Trout Unlimited (TU). A copy of the TU report is included as Appendix B. The same type of study is currently being completed on the four Stauffer Run discharges and will be added to this report once it is completed. To date, no projects to remediate for AMD have been completed in the study area.

A request for EPA 319 funding to perform comprehensive studies of all of the AMD sources was submitted in the Spring 2008 and has not been awarded to date. If this request is approved, the funding will be used to perform preliminary investigations at all

of the AMD sources to determine the size, type and scope of possible remediation projects that can be performed in the future. The following AMD project summaries were developed based on existing information that was collected during the development of this implementation plan. Several of the AMD source locations were not known prior to this study and prioritization may change based on further investigation. The locations of the discharges and spoils piles are depicted on figure 5.

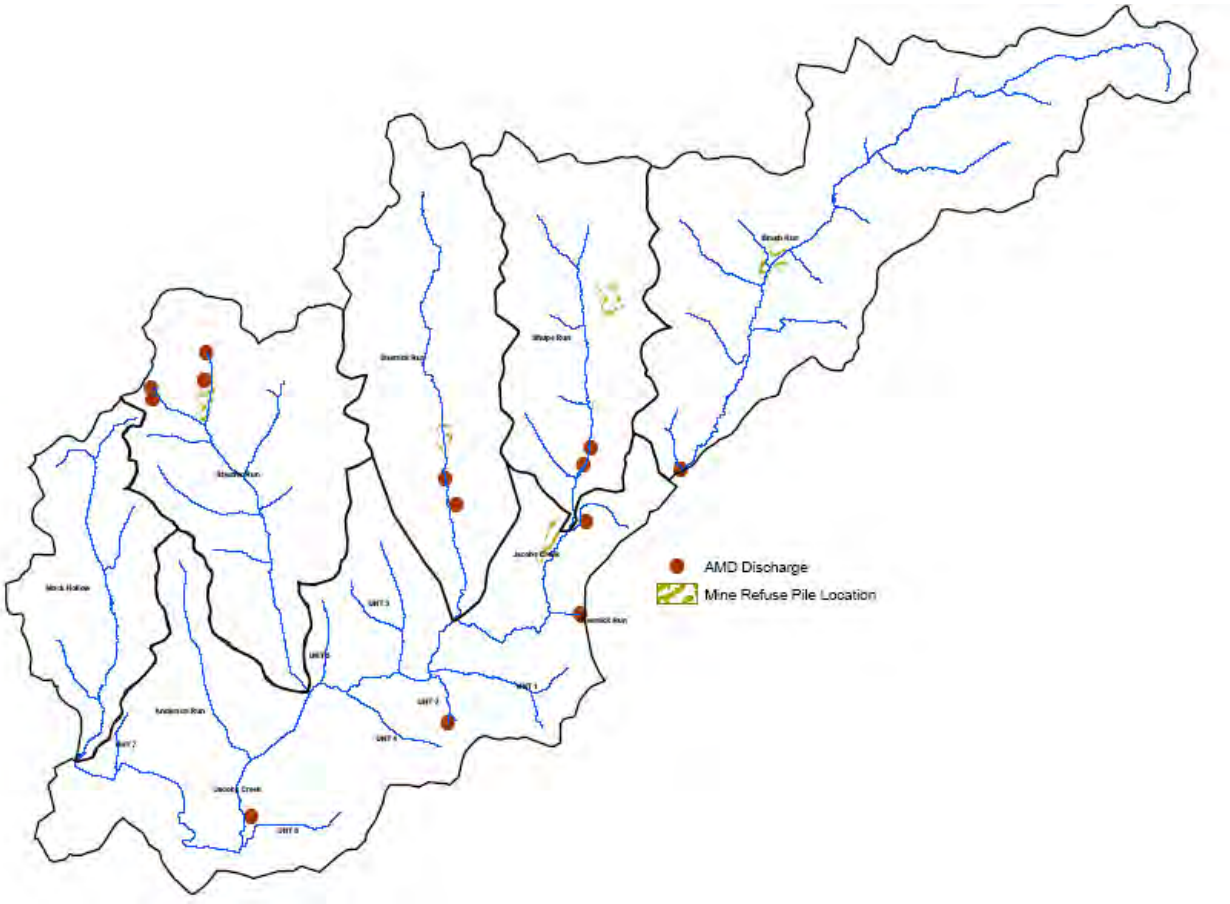


Figure 5. Discharge and Spoil Pile Locations

Stauffer Run Discharges

Phase I

Four AMD discharges are located near the headwaters of Stauffer Run in the vicinity of the Old Zion Church and Almer Farmer in East Huntingdon Township. Preliminary studies are underway at the discharges investigating water chemistry and developing conceptual plans for possible treatment methods. It was decided that it would be more economical to treat each discharge separately.

Phase II

In the spring of 2009 a grant will be submitted for EPA 319 funding to construct the two systems that are currently in the design phase. It is anticipated that based on the type of active chemical treatment that is being proposed at the sites, approximately $50,000 to $75,000 in construction will be required for the two discharges with an additional $5,000 needed every 2 to 3 years to maintain the systems.

Stauffer Run Discharges Funding:

EPA 319 – **$**50,000 – 75,000 for construction of Phase II

Private Sources - $5,000 every three years for operation and maintenance

Remaining two discharges:

EPA 319 - $100,000 design, permitting and construction at remaining 2 Stauffer Run Sites.

Private Sources - operation and maintenance funds as needed

Office of Surface Mining (OSM) funding or technical assistance may also be used as part of the project.

Timeline: Complete Phase I design – Spring 2010; Construct Phase II – Summer 2011 Complete design and construction at other 2 discharges by Winter 2012

Sherrick Run Discharges

Phase I

Two AMD discharges are located along SR119 just north of the SR 819 interchange. A study was completed in 2007 at one of the discharges investigating water chemistry.

Phase II

In the spring of 2010 a grant will be submitted for EPA 319 funding to complete final design, permitting and construction of a treatment system for the two discharges. No detailed information of the second discharge exists at this time and it will be developed as part of this project. The spoil pile area that is located along Quarry Street will also be investigated at this time. If funding is available, remediation will also be performed at this location as part of the project. It is anticipated that based on the type and amount of pollution at the sites, approximately $150,000 to $175,000 in design and construction will

be required for the two discharges with additional funding needed to maintain the systems.

Sherrick Run Discharges Funding:

EPA 319 – $150,000 –175,000 for design and construction of Phase II

Private Sources - operation and maintenance

Office of Surface Mining (OSM) - funding or technical assistance may also be used as part of the project.

Timeline: Complete Phase II design – Fall 2011; Construct Phase II – Summer 2012

Shupe Run Discharges

Phase I

Two AMD discharges are located along the Coal and Coke Trail just north of the town of Bridgeport. Preliminary studies were completed in 2007 at one of the discharges investigating water chemistry. Because of the location of the discharges being in close proximity to the Coal and Coke Trail this project has a high priority for public safety as well as water quality.

Phase II

In the spring of 2009 a grant will be submitted for EPA 319 funding to complete final design, permitting and construction of a treatment system for the two discharges. No detailed information of the second discharge exists at this time and it will be developed as part of this project. The large spoil pile that is located south of Bridgeport along the Coal and Coke Trail will also be investigated at this time. If funding is available, remediation will also be performed at this location as part of the project. It is anticipated that based on the type and amount of pollution at the sites, approximately $150,000 to $175,000 in design and construction will be required for the two discharges with additional funding needed to maintain the systems.

Shupe Run Discharges Funding:

EPA 319 – $150,000 –175,000 for design and construction of Phase II

Private Sources - operation and maintenance

Office of Surface Mining (OSM) - funding or technical assistance may also be used as part of the project.

Timeline: Complete Phase II design – Fall 2010; Construct Phase III – Summer 2011

Brush Run Discharge

Phase I

One AMD discharge is located near the Bridgeport Dam. This discharge was not known prior to the implementation plan study and no information currently exists about the site. Phase I studies will be performed as part of the funding that was requested in the Spring of 2008. A large spoil pile also is located in the sub watershed and is contributing both chemical and sediment pollution to the stream.

Phase II

Based upon the results of the preliminary studies, a grant will be submitted for EPA 319 funding to complete final design, permitting and construction of a treatment system. The discharge appears to sustain high flows and appears to be acidic in nature. Not enough information is available to accurately estimate any cost at this time.

Brush Run Discharge Funding:

EPA 319 –for design and construction of Phase II

Private Sources - operation and maintenance

Office of Surface Mining (OSM) - funding or technical assistance may also be used as part of the project.

Timeline: Complete Phase I studies– Fall 2010; Phase II work begins – Summer 2012

UNT 2 Discharge

Phase I

One AMD discharge is located along SR 119 just west of the Mt. Carmel Church. This discharge was not known prior to implementation plan study and no information currently exists about the site. Phase I studies will be performed as part of the funding that was requested in the Spring of 2008.

Phase II

Based upon the results of the preliminary studies, a grant will be submitted for EPA 319 funding to complete final design, permitting and construction of a treatment system. The discharge appears to sustain high flows and appears to be acidic in nature. Not enough information is available to accurately estimate any cost at this time.

UNT 2 Discharge Funding:

EPA 319 –for design and construction of Phase II

Private Sources - operation and maintenance

Office of Surface Mining (OSM) - funding or technical assistance may also be used as part of the project.

Timeline: Complete Phase I studies– Fall 2010; Phase II work begins – Summer 2012

UNT 6 Discharge

Phase I

One AMD discharge is located below Everson on UNT 6. This discharge was not known prior to the implementation plan study and no information currently exists about the site. Phase I studies will be performed as part of the funding that was requested in the Spring of 2008.

Phase II

Based upon the results of the preliminary studies, a grant will be submitted for EPA 319 funding to complete final design, permitting and construction of a treatment system. The discharge appears to sustain high flows and appears to be acidic in nature. Not enough information is available to accurately estimate any cost at this time. The discharge is associated with an existing wetland system that may be providing some water quality improvements.

UNT 6 Discharge Funding:

EPA 319 –for design and construction of Phase II

Private Sources - operation and maintenance

Office of Surface Mining (OSM) - funding or technical assistance may also be used as part of the project.

Timeline: Complete Phase I studies– Fall 2010; Phase II work begins – Summer 2012

Jacobs Creek Discharge

Phase I

One AMD discharge is located near the Bridgeport Sportsmen's Club just west of Bridgeport. This discharge was not known prior to the implementation plan study and no information currently exists about the site. Phase I studies will be performed as part of the funding that was requested in the Spring of 2008.

Phase II

Based upon the results of the preliminary studies, a grant will be submitted for EPA 319 funding to complete final design, permitting and construction of a treatment system. The discharge appears to sustain high flows and appears to be acidic in nature. Not enough information is available to accurately estimate any cost at this time.

Jacobs Creek Discharge Funding:

EPA 319 –for design and construction of Phase II

Private Sources - operation and maintenance

Office of Surface Mining (OSM) - funds or technical assistance may also be used as part of the project.

Timeline: Complete Phase I studies– Fall 2010**;** Phase II work begins – Summer 2012

Additional funding will be requested to perform remedial activities for several spoil piles that are located within the study area. These piles contribute to water chemistry problems as well as add sediment into the receiving waters. Projects will be developed as more information becomes available. Projects will be developed using the AMD Treat modeling as a guide.

11.3 Urban Stormwater Projects

Urban stormwater runoff and the associated pollutants (sediment, chemicals, flood flows) were identified as a major cause of impairment on several sub-watersheds during the 2002 assessment performed by the PA DEP as part of the 303(d) list assessment. The field reconnaissance that was performed during the development of the implementation plan identified bank erosion and sediment deposition as a leading cause of impairment throughout the study area. The impacted sub-watersheds include Stauffer Run, Sherrick

Run, Shupe Run, UNT 3, UNT 4, UNT 5, UNT 6, UNT 7, Anderson Run and Jacobs Creek. Runoff from Mt. Pleasant Borough, Scottdale, and Everson are the major sources of pollution. Refer to figure 6 for source locations.

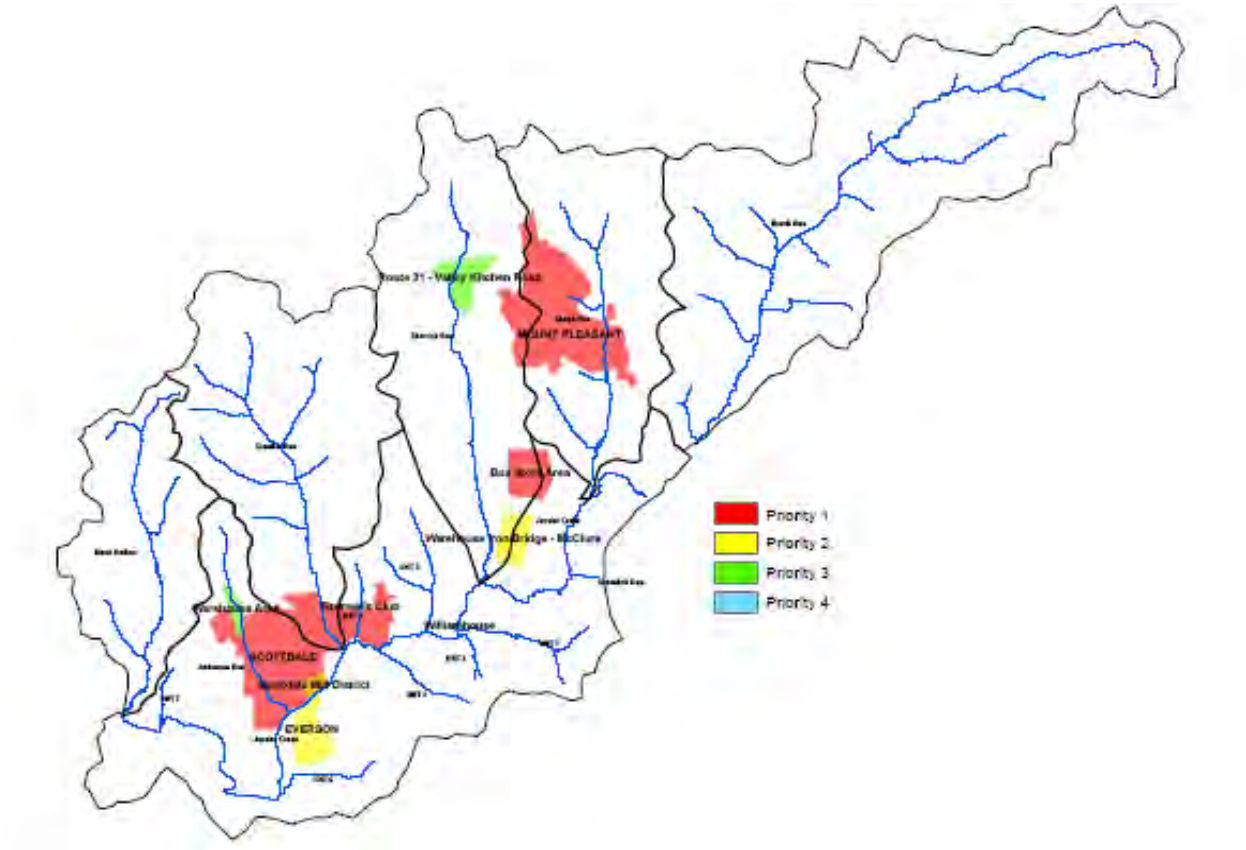


Figure 6. Urban Runoff Areas

Mt. Pleasant, Scottdale, and Everson are all urban centers that are located in the study area. Most of the development occurred in these areas prior to the implementation of stormwater regulations and BMP technology development. Mt. Pleasant Borough is the largest of the urban centers and some funding has already been approved to investigate and develop BMPs. Funding was requested in the spring of 2008 to begin to develop stormwater BMPs for Scottdale as well. The area between the towns of Scottdale and Mt. Pleasant has been experiencing urban sprawl over the past 15 years and several large box stores and warehouse type buildings have been constructed in this area.

Because of the high cost of developing and implementing urban stormwater BMP retrofits, project areas will be discussed as priority areas. Individual projects will be developed as a part of the overall pollution source area. Modeling will be based on the complete treated priority area. The following project summaries were developed based on existing information that was collected during the development of this implementation plan. Prioritization may change based on further investigation.

Mt. Pleasant Borough

Phase I

Mt. Pleasant Borough was awarded an EPA 319 grant in 2008 to complete the first of many phases of stormwater BMPs retrofits in the Borough. Several municipal parking lots will be retrofitted with stormwater BMPs to reduce and treat parking lot runoff. As part of this grant, additional areas will be investigated in the Borough for future BMP development.

Phase II

A second grant request was submitted in the spring of 2008 for additional funding to install additional parking area BMPs and begin to develop residential area runoff BMPs such as community rain gardens to treat roof gutter runoff.

Phase III

As the initial phases of the Mt. Pleasant Borough projects are implemented, additional funding will be requested to implement additional BMPs.

Mt. Pleasant Borough Funding:

Phase I

EPA 319 – $72,327.00

Westmoreland Conservation District - technical assistance to develop engineering for BMPs

Mt. Pleasant Borough – Cost to install and maintain BMPs

Phase II

EPA 319 – $475,000.00

Westmoreland Conservation District - technical assistance to develop engineering for BMPs

Mt. Pleasant Borough **–** Cost to install and maintain BMPs

Phase III

EPA 319 – TBD

Westmoreland Conservation District **-** technical assistance to develop engineering for BMPs

Mt. Pleasant Borough – Cost to install and maintain BMPs

Timeline **-** Complete Phase I work– Fall 2009**;** Complete Phase II work – Summer 2010

Phase III – over the next several years additional projects will be developed and implemented as funding allows.

Affected watersheds – Shupe Run, Sherrick Run, and Jacobs Creek

Scottdale Borough

Phase I

A grant request was submitted in the spring of 2008 for funding to install parking area BMPs in the Borough of Scottdale. Included in the request was additional funding to investigate other areas in the Borough for opportunities to install BMPs with future funding.

Phase II

As the initial Phase of the Scottdale Borough Project is implemented, additional funding will be requested to implement BMPs throughout the borough. Initially, funding will be requested for areas near Southmoreland Middle School, Kendi Park, and Anderson Run. Additional areas will be investigated for BMP installation as funding becomes available.

Scottdale Borough Funding:

Phase I

EPA 319 – $180,000 for project development and material cost

Westmoreland Conservation District - technical assistance to develop engineering for BMPs

Scottdale Borough – Cost to install and maintain BMPs

JCWA – Technical assistance and project development and management

Phase II

EPA 319 – TBD

Westmoreland Conservation District - technical assistance to develop engineering for BMPs

Mt. Pleasant Borough **–** Cost to install and maintain BMPs

JCWA **–** Technical assistance and project development and management

Timeline: Complete Phase I work– Fall 2010; Phase II – over the next several years additional projects will be developed and implemented as funding allows.

Affected watersheds – Stauffer Run, Anderson Run, UNT 3, UNT 4, UNT 5, and Jacobs Creek

SR 119 – SR 819 Box Store Areas

Phase I

A grant request will be submitted in the spring of 2010 for funding to install parking area BMPs for the Palmer Medical Pavilion Building, Kmart parking lot, and Big Lots parking lot. The grant request will include funding for BMP development and construction cost.

Phase II

As Phase I is being implemented, additional funding will be requested to develop BMPs for the parking lot at the Countryside Plaza. A portion of this lot drains into a detention basin located behind the stores, but the majority drains into a severely eroding drainage way to the west of the lot.

Box Store Area Funding:

Phase I

EPA 319 –Approximately $200,000 for project development and materials cost

Westmoreland Conservation District - technical assistance to develop engineering for BMPs

Property Owners – Donation of land to install BMPs

JCWA – Technical assistance and project development and management

Phase II

EPA 319 – Approximately $100,000 for project development and materials cost

Westmoreland Conservation District - technical assistance to develop engineering for BMPs

Property Owners – Donation of land to install BMPs

JCWA – Technical assistance and project development and management

Timeline: Complete Phase I work– Fall 2012; Phase II – Summer 2013

Affected watersheds – Sherrick Run and Jacobs Creek

Everson Area

Phase I

A grant request will be submitted for funding to develop and install parking area BMPs, and larger industrial area (i.e. dog food plant) BMPs in the spring of 2013.

Phase II

As Phase I is being implemented, additional funding will be requested to develop BMPs for the residential areas.

Everson Area Funding:

Phase I

EPA 319 –TBD

Fayette Conservation District - technical assistance

Property Owners – Donation of land to install BMPs

JCWA – Technical assistance and project development and management

Everson / Upper Tyrone Township –assistance as needed

Phase II

EPA 319 – Approximately $100,000 for project development and materials cost

Fayette Conservation District - technical assistance

Property Owners – Donation of land to install BMPs

JCWA – Technical assistance and project development and management

Everson / Upper Tyrone Township **–** assistance as needed

Timeline: Complete Phase I work– Fall 2013; Phase II – Summer 2014

Affected watersheds – UNT 6 and Jacobs Creek

Warehouses (Iron Bridge - McClure) Area

A grant request will be submitted for funding to install parking area BMPs and roof drain (gutter) BMPs for several large warehouse buildings in the Iron Bridge Area.

Iron Bridge - McClure Area Funding:

EPA 319 –Approximately $60,000 for project development and materials cost

Westmoreland-Fayette Conservation Districts - technical assistance and engineering for BMPs

Property Owners – Donation of land to install BMPs

JCWA – Technical assistance and project development and management

Timeline: TBD

Affected watersheds – Sherrick Run and Jacobs Creek

Scottdale Mill District

A grant request will be submitted for funding to install parking area BMPs and roof drain BMPs for several large mill buildings along Jacobs Creek in Scottdale.

Scottdale Mill District Area Funding:

EPA 319 –Approximately $50,000 for project development and materials cost

Westmoreland Conservation District - technical assistance to develop engineering for BMPs

Property Owners – Donation of land to install BMPs

JCWA – Technical assistance and project development and management

Timeline: TBD

Affected watersheds –Jacobs Creek

Warehouse (Stauffer Run) Area

A grant request will be submitted for funding to install parking area BMPs and roof drain BMPs for several large warehouse buildings in the Iron Bridge Area.

Warehouses Stauffer Run Funding:

EPA 319 –Approximately $40,000 for project development and materials cost

Westmoreland-Fayette Conservation Districts - technical assistance and engineering for BMPs

Property Owners – Donation of land to install BMPs

JCWA – Technical assistance and project development and management

Timeline: TBD

Affected watersheds – Stauffer Run

Route 31 - Valley Kitchen Road

A grant request will be submitted for funding to install BMPs for several businesses (Valley Kitchen, 84 Lumber, Kings Point) and residential buildings in the Valley Kitchen Road – Route 31 area. Projects will be modified according to available funding.

Route 31 – Valley Kitchen Road Area Funding:

EPA 319 –Approximately $180,000 for project development and materials cost

Westmoreland Conservation Districts - technical assistance and engineering for BMPs

Property Owners – Donation of land to install BMPs

JCWA – Technical assistance and project development and management

Timeline: TBD

Affected watersheds – Sherrick Run

Williamhouse

A grant request will be submitted for funding to install parking area BMPs and roof drain BMPs for several large warehouse buildings associated with Williamhouse.

Williamhouse Area Funding:

EPA 319 –Approximately $50,000 for project development and materials cost

Fayette Conservation Districts - technical assistance

Property Owners – Donation of land to install BMPs

JCWA – Technical assistance and project development and management

Timeline: TBD

Affected watersheds – Jacobs Creek

Scottdale Firemen's Club/ Green Acres Property

A grant request will be submitted for funding to install parking area BMPs, Storage Area BMPs and roof drain BMPs for the Firemen's Club and Green Acres Storage yard.

Firemen's Club – Green Acres Area Funding:

EPA 319 –Approximately $50,000 for project development and materials cost

Westmoreland-Fayette Conservation Districts - technical assistance and engineering for BMPs

Property Owners – Donation of land to install BMPs

JCWA – Technical assistance and project development and management

Timeline: TBD

Affected watersheds – UNT 5

PRedICT Modeling was used to characterize the amount of pollution that would be removed from each sub-watershed resulting from implementation of the stormwater projects. For the purpose of this report, the modeling was done at 25% of the impervious surface treated, 50%, 75% and 100%. High density urban BMPs were modeled to be completed in the first 50%. Table 5 below is a summary of the modeling.

Table 5. Estimated Stormwater BMP Cost

Watershed	Shupe Run	Sherrick Run	Stauffer Run	Jacobs Creek*
pounds of sediment removed at 25% impervious treated	29,108.00	26,439.00	26,439.00	25,048.00
cost	$ 638,800.00	$ 101,540.00	$ 101,540.00	$ 463,370.00
50%	46,334.00	44,280.00	44,280.00	63473.00
cost	$ 1,223,400.00	$ 520,540.00	$ 520,540.00	$ 1,041,070.00
75%	47,271.00	44,902.00	44,920.00	69,510.00
cost	$ 1,755,400.00	$ 862,140.00	$ 862,140.00	$ 1,351,770.00
100%	81,911.00	45,136.00	45,136.00	82059.00
cost	$ 2,250,800.00	$ 998,140.00	$ 998,140.00	$ 1,709,070.00

*including Unt 3, 4, 5, 6, and Andrerson Run

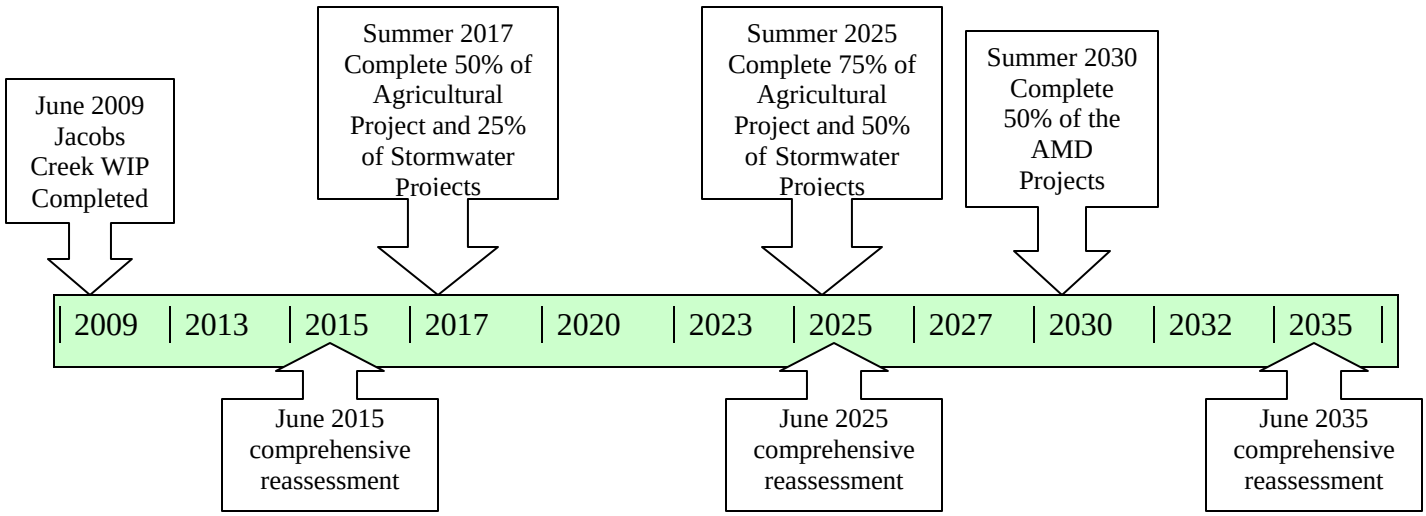
12.0 Implementation Schedule

Several projects are currently in the planning stages for implementation in the watershed. The Jacobs Creek Watershed Association is currently trying to secure funding to assess the rest of the middle Jacobs Creek Watershed AMD sites. The Jacobs Creek Watershed Association is also looking to fund several stormwater projects for Scottdale Borough. The Mt. Pleasant Borough and Westmoreland Conservation District are developing several stromwater projects for Mt. Pleasant. Funding is also in place to complete the design for two of the Stauffer Run AMD discharges.

Once the Jacobs Creek Watershed Implementation Plan is approved the watershed association will work with the Westmoreland County and Fayette County Conservation Districts to begin developing possible agricultural BMP projects. It is anticipated that funding will be requested to complete between four to six projects a year. In addition to the watershed group, Mt. Pleasant Borough, Scottdale Borough and the county

conservation districts will be encouraged to sponsor additional projects. With a number of different groups dividing up the workload, additional funding can be utilized from sources outside the 319 program and projects can be completed more efficiently.

It is anticipated that 75% of the agricultural projects and 50% of the stormwater BMP projects will be implemented by 2025. AMD projects will be undertaken on a broader schedule and it is anticipated that 50% of the AMD issues in the watershed be resolved by 2030. This schedule is depending primarily on funding, as well as group stability and the willingness of property owners to get involved.



13.0 Public Information and Participation

Notification of the completion of this plan will be made through the Jacobs Creek Watershed Association and their contacts, by way of the watershed newsletter, through contacts made with both the Fayette and Westmoreland County Conservation Districts, through Scottdale and Mt. Pleasant Boroughs and through other educational and outreach programs. Copies of the Plan will be available for review at the Fayette and Westmoreland County Conservation District Offices. A copy will also be available at the Scottdale Borough Building.

The majority of review, planning, prioritization, working with land owners, and securing of funding will be done by the Jacobs Creek Watershed Association in association with the County Conservation Districts. JCWA's meetings will be open to the public to address questions concerning project progress and implementation. The group will also be available by phone or email to answer any questions.

The Jacobs Creek Watershed Association works closely with the surrounding community during project development and implementation. The local newspapers attend the board meetings on a regular basis. The watershed group has a display that is set up at local public events and the county fair each year. Representatives are at all of these events to promote the group and answer questions. The group also has a website and advetise regularly in region pamphlets.

14.0 Water Quality Monitoring and Evaluation

14.1 Sampling Methods

Monitoring will be conducted by the JCWA to verify the progress of stream improvements in the effected watershed area. JCWA will use the same methods used by the PA DEP during the 2002 assessment. The modified EPA Rapid Bioassessment Index habitat protocol score sheet will be used for habitat evaluation. Chemical evaluations will include stream and air temperature, dissolved oxygen, pH, total suspended solids, turbidity, and in the AMD impacted streams – iron, sulfur, aluminum, acidity, alkalinity, and other chemical parameters deemed necessary. This sampling will be completed using a HACH portable laboratory. Samples will be sent to a PA DEP approved laboratory for nitrates and phosphorous.

Pebble counts and in-stream sediment levels will be used to determine reductions in sediment. These parameters have not been measured in the watershed previously. A meeting will be held with the PA DEP to determine the most appropriate methods for establishing standards to perform this type of monitoring and a plan will be established and implemented. Macroinvertebrate sampling will be completed during the sediment

sampling. It is anticipated that this sampling will occur twice a year during May and October.

Other monitoring efforts will focus on key parameters such as nitrates, nitrites, phosphorous and physical habitat assessments. The majority of the monitoring sites for the project will focus on public properties that are accessible, locations above and below BMP projects, and the PA DEP assessment points. Once a project is awarded, sample points will be established prior to the commencement of work to gather monitoring data. Computer modeling will also continue to be used to account for load reductions.

A comprehensive reassessment of the complete study area will be completed in 2015, 2025, and 2035 to re-assess the overall improvements to the watershed. The intent of this project is to remove the study area streams from the 303(d) list and these comprehensive reassessments will identify if the implementation plan is achieving this goal. Interim milestones will be assessed in December of each year after the sampling data for the year is completed and evaluated. It is the intent of the watershed group to see a 5% to 7% reduction in pollution every 5 years. This will very based on which projects can be completed, but a 25% reduction in pollution over a 25 – 30 year period is the goal of this plan.

15.0 Remedial Action

If progress is not achieved with the implementation of the proposed BMPs prescribed in this plan and things do not improve as intended, action will need to be taken to correct the issues. The current implementation plan will need to be assessed to determine how problems within the watershed can be addressed.

Comparison of the prescribed implementation and water quality milestones with actual results will be completed by the County Conservation Districts with the assistance of the JCWA every 5 years. Depending on the results, steps may be taken to implement new BMPs, modify existing BMPs, or implement other projects to reduce pollution loading.

References

Commonwealth of Pennsylvania. 1999. Pennsylvania Code. Title 25 Environmental Protection. Department of Environmental Protection. Chapter 93 Water Quality Standards. Harrisburg, PA

Pennsylvania State University Resources Research Institute. 2003. AVGWLF version 5.0 user guide. The Pennsylvania State University. State College, PA

U.S. Environmental Protection Agency (5). September 9, 2003. Rapid Bioassessment Protocols For Use in Streams and Rivers: Periphyton, Benthic, Macroinvertebrates, and Fish

APPENDIX A: PREDICT MODELS

Mock Hollow Watershed Total Estimated Load Reductions

	Existing (lbs)		
UPLAND EROSION/RUNOFF	Total Sed (lbs)	Total N (lbs)	Total P (lbs)
Row Crops	554534	2399	237
Hay/Pasture	61274	558	53
High Density Urban	0	0	0
Low Density Urban	10875	50	8
Unpaved Roads	0	0	0
Other	35727	171	16
STREAMBANK EROSION	50230	3	1
GROUNDWATER/SUBSURFACE		11184	129
POINT SOURCE DISCHARGE		0	0
SEPTIC SYSTEMS		90	9
FARM ANIMALS		5497	1009
TOTALS	**712640**	**19952**	**1462**
	Future (lbs)		
LAND EROSION/RUNOFF	Total Sed (lbs)	Total N (lbs)	Total P (lbs)
Row Crops	231949	1043	123
Hay/Pasture	61274	558	53
High Density Urban	0	0	0
Low Density Urban	4568	18	4
Unpaved Roads	0	0	0
Other	35727	171	16
STREAMBANK EROSION	43271	3	1
GROUNDWATER/SUBSURFACE		11170	133
POINT SOURCE DISCHARGE		0	0
SEPTIC SYSTEMS		90	9
FARM ANIMALS		3323	654
TOTALS	**376789**	**16375**	**993**
PERCENT REDUCTIONS	47.1	34.6	76.8
TOTAL SCENARIO COST	$194,168.40		
Ag BMP Cost (%)	0.0		
WW Upgrade Cost (%)	0.0		
Urban BMP Cost (%)	0.0		
Stream Protection Cost (%)	100.0		

Unpaved Road Protection Cost (%)	0	

Pathogen Loads		
Source	**Existing (orgs/month)**	**Future (orgs/month)**
Farm Animals	9.059e+14	3.774e+14
WWTP	0.000e+00	0.000e+00
Septic Systems	1.921e+12	1.921e+12
Urban Areas	4.049e+15	1.215e+15
Wildlife	1.093e+11	1.093e+11
Totals	4.957e+15	1.594e+15
PERCENT REDUCTIONS		67.84
TOTAL SCENARIO COST	$194,168.40	

Jacob Creek Total Projects Estimated Load Reductions

	Existing (lbs)		
UPLAND EROSION/RUNOFF	Total Sed (lbs)	Total N (lbs)	Total P (lbs)
Row Crops	706884	3056	251
Hay/Pasture	136972	2046	176
High Density Urban	22634	1910	206
Low Density Urban	58039	429	71
Unpaved Roads	1386	14	1
Other	427326	2261	153
STREAMBANK EROSION	970334	49	21
GROUNDWATER/SUBSURFACE		50305	595
POINT SOURCE DISCHARGE		23678	296
SEPTIC SYSTEMS		356	49
FARM ANIMALS		2154	401
TOTALS	**2323575**	**86258**	**2220**
	Future (lbs)		
LAND EROSION/RUNOFF	Total Sed (lbs)	Total N (lbs)	Total P (lbs)
Row Crops	622058	2651	224
Hay/Pasture	136972	2046	176
High Density Urban	0	0	0
Low Density Urban	0	0	4
Unpaved Roads	0	0	0
Other	427326	2261	153
STREAMBANK EROSION	838646	42	18
GROUNDWATER/SUBSURFACE		48818	595
POINT SOURCE DISCHARGE		23678	296
SEPTIC SYSTEMS		356	49
FARM ANIMALS		1981	379
TOTALS	**2025002**	**81834**	**1894**
PERCENT REDUCTIONS	12.9	7.4	31.7
TOTAL SCENARIO COST	$1,331,100.00		
Ag BMP Cost (%)	0.0		
WW Upgrade Cost (%)	0.0		
Urban BMP Cost (%)	0.0		
Stream Protection Cost (%)	100.0		

Unpaved Road Protection Cost (%)	0	

Pathogen Loads		
Source	**Existing (orgs/month)**	**Future (orgs/month)**
Farm Animals	2.111e+14	1.898e+14
WWTP	0.000e+00	0.000e+00
Septic Systems	9.438e+12	9.438e+12
Urban Areas	1.606e+16	4.818e+15
Wildlife	6.761e+11	6.761e+11
Totals	1.628e+16	5.018e+15
PERCENT REDUCTIONS		69.18
TOTAL SCENARIO COST	$1,331,100.00	

Stauffer Run Watershed Estimated Load Reductions

	Existing (lbs)		
UPLAND EROSION/RUNOFF	Total Sed (lbs)	Total N (lbs)	Total P (lbs)
Row Crops	969246	3618	348
Hay/Pasture	118607	765	72
High Density Urban	191	84	9
Low Density Urban	37280	163	27
Unpaved Roads	5835	25	2
Other	601953	2006	186
STREAMBANK EROSION	172668	9	4
GROUNDWATER/SUBSURFACE		15189	210
POINT SOURCE DISCHARGE		0	0
SEPTIC SYSTEMS		172	21
FARM ANIMALS		2856	416
TOTALS	**1905780**	**24887**	**1295**
	Future (lbs)		
LAND EROSION/RUNOFF	Total Sed (lbs)	Total N (lbs)	Total P (lbs)
Row Crops	524037	2027	197
Hay/Pasture	115523	699	67
High Density Urban	191	84	9
Low Density Urban	13255	47	11
Unpaved Roads	5835	25	2
Other	601953	2006	186
STREAMBANK EROSION	144140	8	3
GROUNDWATER/SUBSURFACE		15171	210
POINT SOURCE DISCHARGE		0	0
SEPTIC SYSTEMS		172	21
FARM ANIMALS		2367	359
TOTALS	**1404935**	**22607**	**1066**
PERCENT REDUCTIONS	26.3	18.7	45.4
TOTAL SCENARIO COST	$1,163,783.50		
Ag BMP Cost (%)	52.9		
WW Upgrade Cost (%)	0.0		
Urban BMP Cost (%)	0.0		
Stream Protection Cost (%)	46.4		

Unpaved Road Protection Cost (%)	0

Pathogen Loads		
Source	**Existing (orgs/month)**	**Future (orgs/month)**
Farm Animals	2.980e+14	2.172e+14
WWTP	0.000e+00	0.000e+00
Septic Systems	4.089e+12	4.089e+12
Urban Areas	1.558e+16	6.174e+15
Wildlife	2.645e+11	2.645e+11
Totals	1.588e+16	6.395e+15
PERCENT REDUCTIONS		59.74
TOTAL SCENARIO COST	$1,163,783.50	

Sherrick Run Estimated Load Reductions

	Existing (lbs)		
UPLAND EROSION/RUNOFF	Total Sed (lbs)	Total N (lbs)	Total P (lbs)
Row Crops	929766	3976	296
Hay/Pasture	99546	1485	114
High Density Urban	933	213	23
Low Density Urban	67388	322	53
Unpaved Roads	5085	28	2
Other	380531	1918	132
STREAMBANK EROSION	268489	13	6
GROUNDWATER/SUBSURFACE		27167	326
POINT SOURCE DISCHARGE		0	0
SEPTIC SYSTEMS		165	21
FARM ANIMALS		1237	277
TOTALS	**1751738**	**36524**	**1250**
	Future (lbs)		
LAND EROSION/RUNOFF	Total Sed (lbs)	Total N (lbs)	Total P (lbs)
Row Crops	668832	2745	222
Hay/Pasture	99546	1485	114
High Density Urban	933	213	23
Low Density Urban	0	0	0
Unpaved Roads	5085	28	2
Other	380531	1918	132
STREAMBANK EROSION	140957	7	3
GROUNDWATER/SUBSURFACE		23881	326
POINT SOURCE DISCHARGE		0	0
SEPTIC SYSTEMS		165	21
FARM ANIMALS		993	235
TOTALS	**1295883**	**31434**	**1077**
PERCENT REDUCTIONS	26.0	16.7	32.6
TOTAL SCENARIO COST	$1,063,200.00		
Ag BMP Cost (%)	0.0		
WW Upgrade Cost (%)	0.0		
Urban BMP Cost (%)	0.0		
Stream Protection Cost (%)	100.0		

Unpaved Road Protection Cost (%)	0	

Pathogen Loads		
Source	**Existing (orgs/month)**	**Future (orgs/month)**
Farm Animals	1.507e+14	1.110e+14
WWTP	0.000e+00	0.000e+00
Septic Systems	4.092e+12	4.092e+12
Urban Areas	2.151e+16	7.146e+15
Wildlife	1.481e+11	1.481e+11
Totals	2.167e+16	7.262e+15
PERCENT REDUCTIONS		66.49
TOTAL SCENARIO COST	$1,063,200.00	

Shupe Run Watershed Estimated Load Reductions

	Existing (lbs)		
UPLAND EROSION/RUNOFF	Total Sed (lbs)	Total N (lbs)	Total P (lbs)
Row Crops	422783	2124	160
Hay/Pasture	29852	542	45
High Density Urban	2692	599	65
Low Density Urban	79219	474	78
Unpaved Roads	0	0	0
Other	285690	1445	99
STREAMBANK EROSION	306453	16	7
GROUNDWATER/SUBSURFACE		14039	225
POINT SOURCE DISCHARGE		7159	90
SEPTIC SYSTEMS		87	11
FARM ANIMALS		0	0
TOTALS	**1126689**	**26485**	**780**
	Future (lbs)		
LAND EROSION/RUNOFF	Total Sed (lbs)	Total N (lbs)	Total P (lbs)
Row Crops	257101	1328	102
Hay/Pasture	29852	542	45
High Density Urban	0	0	0
Low Density Urban	0	0	0
Unpaved Roads	0	0	0
Other	285690	1445	99
STREAMBANK EROSION	293220	15	7
GROUNDWATER/SUBSURFACE		14038	225
POINT SOURCE DISCHARGE		7159	90
SEPTIC SYSTEMS		87	11
FARM ANIMALS		0	0
TOTALS	**865862**	**24615**	**579**
PERCENT REDUCTIONS	23.2	7.1	25.8
TOTAL SCENARIO COST	$376,475.00		
Ag BMP Cost (%)	0.2		
WW Upgrade Cost (%)	0.0		
Urban BMP Cost (%)	0.0		
Stream Protection Cost (%)	99.8		

Unpaved Road Protection Cost (%)	0	

Pathogen Loads		
Source	**Existing (orgs/month)**	**Future (orgs/month)**
Farm Animals	0.000e+00	0.000e+00
WWTP	0.000e+00	0.000e+00
Septic Systems	2.098e+12	2.098e+12
Urban Areas	2.237e+16	6.711e+15
Wildlife	1.437e+11	1.437e+11
Totals	2.237e+16	6.714e+15
PERCENT REDUCTIONS		69.99
TOTAL SCENARIO COST	$376,475.00	

Brush Run Estimated Load Reductions

	Existing (lbs)		
UPLAND EROSION/RUNOFF	Total Sed (lbs)	Total N (lbs)	Total P (lbs)
Row Crops	787809	4020	336
Hay/Pasture	132641	1975	168
High Density Urban	589	36	4
Low Density Urban	71912	198	33
Unpaved Roads	6578	32	2
Other	395522	1748	119
STREAMBANK EROSION	243307	12	5
GROUNDWATER/SUBSURFACE		41339	542
POINT SOURCE DISCHARGE		0	0
SEPTIC SYSTEMS		231	32
FARM ANIMALS		7586	838
TOTALS	**1638358**	**57177**	**2079**
	Future (lbs)		
LAND EROSION/RUNOFF	Total Sed (lbs)	Total N (lbs)	Total P (lbs)
Row Crops	562097	2749	250
Hay/Pasture	125744	1635	145
High Density Urban	0	0	0
Low Density Urban	0	0	0
Unpaved Roads	6578	32	2
Other	395522	1748	119
STREAMBANK EROSION	194189	10	4
GROUNDWATER/SUBSURFACE		36042	542
POINT SOURCE DISCHARGE		0	0
SEPTIC SYSTEMS		231	32
FARM ANIMALS		8286	926
TOTALS	**1284130**	**50734**	**2020**
PERCENT REDUCTIONS	21.6	25.8	47.4
TOTAL SCENARIO COST	$1,373,028.00		
Ag BMP Cost (%)	14.3		
WW Upgrade Cost (%)	0.0		
Urban BMP Cost (%)	0.0		
Stream Protection Cost (%)	85.7		

Unpaved Road Protection Cost (%)	0	

Pathogen Loads		
Source	**Existing (orgs/month)**	**Future (orgs/month)**
Farm Animals	5.542e+14	4.194e+14
WWTP	0.000e+00	0.000e+00
Septic Systems	6.079e+12	6.079e+12
Urban Areas	1.899e+16	5.698e+15
Wildlife	5.713e+11	5.713e+11
Totals	1.955e+16	6.124e+15
PERCENT REDUCTIONS		68.68
TOTAL SCENARIO COST	$1,373,028.00	

Site #4: Lowe Farm Project Estimated Load Reductions

	Existing (lbs)		
UPLAND EROSION/RUNOFF	Total Sed (lbs)	Total N (lbs)	Total P (lbs)
Row Crops	554534	2399	237
Hay/Pasture	61274	558	53
High Density Urban	0	0	0
Low Density Urban	10875	50	8
Unpaved Roads	0	0	0
Other	35727	171	16
STREAMBANK EROSION	50230	3	1
GROUNDWATER/SUBSURFACE		11184	129
POINT SOURCE DISCHARGE		0	0
SEPTIC SYSTEMS		90	9
FARM ANIMALS		5497	1009
TOTALS	**712640**	**19952**	**1462**
	Future (lbs)		
LAND EROSION/RUNOFF	Total Sed (lbs)	Total N (lbs)	Total P (lbs)
Row Crops	529381	2764	246
Hay/Pasture	61274	558	53
High Density Urban	0	0	0
Low Density Urban	10875	50	8
Unpaved Roads	0	0	0
Other	35727	171	16
STREAMBANK EROSION	49236	3	1
GROUNDWATER/SUBSURFACE		11192	133
POINT SOURCE DISCHARGE		0	0
SEPTIC SYSTEMS		90	9
FARM ANIMALS		5351	985
TOTALS	**686493**	**20179**	**1451**
PERCENT REDUCTIONS	3.7	25.7	68.1
TOTAL SCENARIO COST	$27,068.40		
Ag BMP Cost (%)	0.3		
WW Upgrade Cost (%)	0.0		
Urban BMP Cost (%)	0.0		
Stream Protection Cost (%)	99.7		

Unpaved Road Protection Cost (%)	0	

Pathogen Loads		
Source	**Existing (orgs/month)**	**Future (orgs/month)**
Farm Animals	9.059e+14	8.681e+14
WWTP	0.000e+00	0.000e+00
Septic Systems	1.921e+12	1.921e+12
Urban Areas	4.049e+15	4.049e+15
Wildlife	1.093e+11	1.093e+11
Totals	4.957e+15	4.919e+15
PERCENT REDUCTIONS		0.76
TOTAL SCENARIO COST	$27,068.40	

Site #6: Love Farm Project Estimated Load Reductions

	Existing (lbs)		
UPLAND EROSION/RUNOFF	Total Sed (lbs)	Total N (lbs)	Total P (lbs)
Row Crops	554534	2399	237
Hay/Pasture	61274	558	53
High Density Urban	0	0	0
Low Density Urban	10875	50	8
Unpaved Roads	0	0	0
Other	35727	171	16
STREAMBANK EROSION	50230	3	1
GROUNDWATER/SUBSURFACE		11184	129
POINT SOURCE DISCHARGE		0	0
SEPTIC SYSTEMS		90	9
FARM ANIMALS		5497	1009
TOTALS	**712640**	**19952**	**1462**
	Future (lbs)		
LAND EROSION/RUNOFF	Total Sed (lbs)	Total N (lbs)	Total P (lbs)
Row Crops	497100	2571	233
Hay/Pasture	61274	558	53
High Density Urban	0	0	0
Low Density Urban	10875	50	8
Unpaved Roads	0	0	0
Other	35727	171	16
STREAMBANK EROSION	49236	3	1
GROUNDWATER/SUBSURFACE		11944	133
POINT SOURCE DISCHARGE		0	0
SEPTIC SYSTEMS		90	9
FARM ANIMALS		5137	949
TOTALS	**654212**	**20523**	**1402**
PERCENT REDUCTIONS	8.2	22.9	69.0
TOTAL SCENARIO COST	$27,900.00		
Ag BMP Cost (%)	0.0		
WW Upgrade Cost (%)	0.0		
Urban BMP Cost (%)	0.0		
Stream Protection Cost (%)	100.0		

Unpaved Road Protection Cost (%)	0	

Pathogen Loads		
Source	**Existing (orgs/month)**	**Future (orgs/month)**
Farm Animals	9.059e+14	8.115e+14
WWTP	0.000e+00	0.000e+00
Septic Systems	1.921e+12	1.921e+12
Urban Areas	4.049e+15	4.049e+15
Wildlife	1.093e+11	1.093e+11
Totals	4.957e+15	4.862e+15
PERCENT REDUCTIONS		1.90
TOTAL SCENARIO COST	$27,900.00	

Site #8: Catalina Farm Project Estimated Load Reductions

	Existing (lbs)		
UPLAND EROSION/RUNOFF	Total Sed (lbs)	Total N (lbs)	Total P (lbs)
Row Crops	554534	2399	237
Hay/Pasture	61274	558	53
High Density Urban	0	0	0
Low Density Urban	10875	50	8
Unpaved Roads	0	0	0
Other	35727	171	16
STREAMBANK EROSION	50230	3	1
GROUNDWATER/SUBSURFACE		11184	129
POINT SOURCE DISCHARGE		0	0
SEPTIC SYSTEMS		90	9
FARM ANIMALS		5497	1009
TOTALS	**712640**	**19952**	**1462**
	Future (lbs)		
LAND EROSION/RUNOFF	Total Sed (lbs)	Total N (lbs)	Total P (lbs)
Row Crops	497100	2125	215
Hay/Pasture	61274	558	53
High Density Urban	0	0	0
Low Density Urban	10875	50	8
Unpaved Roads	0	0	0
Other	35727	171	16
STREAMBANK EROSION	49236	3	1
GROUNDWATER/SUBSURFACE		10602	129
POINT SOURCE DISCHARGE		0	0
SEPTIC SYSTEMS		90	9
FARM ANIMALS		5141	950
TOTALS	**654212**	**18740**	**1381**
PERCENT REDUCTIONS	8.2	31.9	70.5
TOTAL SCENARIO COST	$27,900.00		
Ag BMP Cost (%)	0.0		
WW Upgrade Cost (%)	0.0		
Urban BMP Cost (%)	0.0		
Stream Protection Cost (%)	100.0		

Unpaved Road Protection Cost (%)	0	

Pathogen Loads		
Source	**Existing (orgs/month)**	**Future (orgs/month)**
Farm Animals	9.059e+14	8.115e+14
WWTP	0.000e+00	0.000e+00
Septic Systems	1.921e+12	1.921e+12
Urban Areas	4.049e+15	4.049e+15
Wildlife	1.093e+11	1.093e+11
Totals	4.957e+15	4.862e+15
PERCENT REDUCTIONS		1.90
TOTAL SCENARIO COST	$27,900.00	

Site #10: Skovira Farm Project Estimated Load Reductions

	Existing (lbs)		
UPLAND EROSION/RUNOFF	Total Sed (lbs)	Total N (lbs)	Total P (lbs)
Row Crops	554534	2399	237
Hay/Pasture	61274	558	53
High Density Urban	0	0	0
Low Density Urban	10875	50	8
Unpaved Roads	0	0	0
Other	35727	171	16
STREAMBANK EROSION	50230	3	1
GROUNDWATER/SUBSURFACE		11184	129
POINT SOURCE DISCHARGE		0	0
SEPTIC SYSTEMS		90	9
FARM ANIMALS		5497	1009
TOTALS	**712640**	**19952**	**1462**
	Future (lbs)		
LAND EROSION/RUNOFF	Total Sed (lbs)	Total N (lbs)	Total P (lbs)
Row Crops	352394	2151	167
Hay/Pasture	61274	558	53
High Density Urban	0	0	0
Low Density Urban	10875	50	8
Unpaved Roads	0	0	0
Other	35727	171	16
STREAMBANK EROSION	49236	3	1
GROUNDWATER/SUBSURFACE		11192	133
POINT SOURCE DISCHARGE		0	0
SEPTIC SYSTEMS		90	9
FARM ANIMALS		5067	941
TOTALS	**509506**	**19282**	**1328**
PERCENT REDUCTIONS	28.5	28.8	73.5
TOTAL SCENARIO COST	$32,756.40		
Ag BMP Cost (%)	14.8		
WW Upgrade Cost (%)	0.0		
Urban BMP Cost (%)	0.0		
Stream Protection Cost (%)	85.2		

Unpaved Road Protection Cost (%)	0	

Pathogen Loads		
Source	**Existing (orgs/month)**	**Future (orgs/month)**
Farm Animals	9.059e+14	8.115e+14
WWTP	0.000e+00	0.000e+00
Septic Systems	1.921e+12	1.921e+12
Urban Areas	4.049e+15	4.049e+15
Wildlife	1.093e+11	1.093e+11
Totals	4.957e+15	4.862e+15
PERCENT REDUCTIONS		1.90
TOTAL SCENARIO COST	$32,756.40	

Site # 17: Poorbaugh Farm (Anderson Run) Estimated Load Reductions

	Existing (lbs)		
UPLAND EROSION/RUNOFF	Total Sed (lbs)	Total N (lbs)	Total P (lbs)
Row Crops	706884	3056	251
Hay/Pasture	136972	2046	176
High Density Urban	22634	1910	206
Low Density Urban	58039	429	71
Unpaved Roads	1386	14	1
Other	427326	2261	153
STREAMBANK EROSION	970334	49	21
GROUNDWATER/SUBSURFACE		50305	595
POINT SOURCE DISCHARGE		23678	296
SEPTIC SYSTEMS		356	49
FARM ANIMALS		2154	401
TOTALS	**2323575**	**86258**	**2220**
	Future (lbs)		
LAND EROSION/RUNOFF	Total Sed (lbs)	Total N (lbs)	Total P (lbs)
Row Crops	692746	2989	246
Hay/Pasture	136972	2046	176
High Density Urban	22634	1910	206
Low Density Urban	46818	337	59
Unpaved Roads	0	0	0
Other	427326	2261	153
STREAMBANK EROSION	965793	49	21
GROUNDWATER/SUBSURFACE		50057	595
POINT SOURCE DISCHARGE		23678	296
SEPTIC SYSTEMS		356	49
FARM ANIMALS		2120	397
TOTALS	**2292289**	**85803**	**2198**
PERCENT REDUCTIONS	1.4	3.0	18.9
TOTAL SCENARIO COST	$55,200.00		
Ag BMP Cost (%)	0.0		
WW Upgrade Cost (%)	0.0		
Urban BMP Cost (%)	0.0		
Stream Protection Cost (%)	100.0		

Unpaved Road Protection Cost (%)	0	

Pathogen Loads		
Source	**Existing (orgs/month)**	**Future (orgs/month)**
Farm Animals	2.111e+14	2.076e+14
WWTP	0.000e+00	0.000e+00
Septic Systems	9.438e+12	9.438e+12
Urban Areas	1.606e+16	1.353e+16
Wildlife	6.761e+11	6.761e+11
Totals	1.628e+16	1.375e+16
PERCENT REDUCTIONS		15.53
TOTAL SCENARIO COST	$55,200.00	

Site# 28: Several Properties along SR 1031 Estimated Load Reductions

	Existing (lbs)		
UPLAND EROSION/RUNOFF	Total Sed (lbs)	Total N (lbs)	Total P (lbs)
Row Crops	706884	3056	251
Hay/Pasture	136972	2046	176
High Density Urban	22634	1910	206
Low Density Urban	58039	429	71
Unpaved Roads	1386	14	1
Other	427326	2261	153
STREAMBANK EROSION	970334	49	21
GROUNDWATER/SUBSURFACE		50305	595
POINT SOURCE DISCHARGE		23678	296
SEPTIC SYSTEMS		356	49
FARM ANIMALS		2154	401
TOTALS	**2323575**	**86258**	**2220**
	Future (lbs)		
LAND EROSION/RUNOFF	Total Sed (lbs)	Total N (lbs)	Total P (lbs)
Row Crops	706884	3056	251
Hay/Pasture	136972	2046	176
High Density Urban	22634	1910	206
Low Density Urban	46818	337	59
Unpaved Roads	0	0	0
Other	427326	2261	153
STREAMBANK EROSION	970334	49	21
GROUNDWATER/SUBSURFACE		50305	595
POINT SOURCE DISCHARGE		23678	296
SEPTIC SYSTEMS		356	49
FARM ANIMALS		2154	401
TOTALS	**2310968**	**86152**	**2207**
PERCENT REDUCTIONS	0.5	2.6	18.7
TOTAL SCENARIO COST	$28,200.00		
Ag BMP Cost (%)	0.0		
WW Upgrade Cost (%)	0.0		
Urban BMP Cost (%)	0.0		
Stream Protection Cost (%)	100.0		

Unpaved Road Protection Cost (%)	0	

Pathogen Loads		
Source	**Existing (orgs/month)**	**Future (orgs/month)**
Farm Animals	2.111e+14	2.111e+14
WWTP	0.000e+00	0.000e+00
Septic Systems	9.438e+12	9.438e+12
Urban Areas	1.606e+16	1.353e+16
Wildlife	6.761e+11	6.761e+11
Totals	1.628e+16	1.376e+16
PERCENT REDUCTIONS		15.51
TOTAL SCENARIO COST	$28,200.00	

Site # 30-33: Railroad Property (UNT 6) Estimated Load Reductions

	Existing (lbs)		
UPLAND EROSION/RUNOFF	Total Sed (lbs)	Total N (lbs)	Total P (lbs)
Row Crops	706884	3056	251
Hay/Pasture	136972	2046	176
High Density Urban	22634	1910	206
Low Density Urban	58039	429	71
Unpaved Roads	1386	14	1
Other	427326	2261	153
STREAMBANK EROSION	970334	49	21
GROUNDWATER/SUBSURFACE		50305	595
POINT SOURCE DISCHARGE		23678	296
SEPTIC SYSTEMS		356	49
FARM ANIMALS		2154	401
TOTALS	**2323575**	**86258**	**2220**
	Future (lbs)		
LAND EROSION/RUNOFF	Total Sed (lbs)	Total N (lbs)	Total P (lbs)
Row Crops	706884	3056	251
Hay/Pasture	136972	2046	176
High Density Urban	22634	1910	206
Low Density Urban	42009	298	53
Unpaved Roads	0	0	0
Other	427326	2261	153
STREAMBANK EROSION	970334	49	21
GROUNDWATER/SUBSURFACE		50305	595
POINT SOURCE DISCHARGE		23678	296
SEPTIC SYSTEMS		356	49
FARM ANIMALS		2154	401
TOTALS	**2306159**	**86113**	**2201**
PERCENT REDUCTIONS	0.8	2.7	18.9
TOTAL SCENARIO COST	$133,500.00		
Ag BMP Cost (%)	0.0		
WW Upgrade Cost (%)	0.0		
Urban BMP Cost (%)	0.0		
Stream Protection Cost (%)	100.0		

Unpaved Road Protection Cost (%)	0	

Pathogen Loads		
Source	**Existing (orgs/month)**	**Future (orgs/month)**
Farm Animals	2.111e+14	2.111e+14
WWTP	0.000e+00	0.000e+00
Septic Systems	9.438e+12	9.438e+12
Urban Areas	1.606e+16	1.396e+16
Wildlife	6.761e+11	6.761e+11
Totals	1.628e+16	1.418e+16
PERCENT REDUCTIONS		12.92
TOTAL SCENARIO COST	$133,500.00	

Site #42: Dublanski Farm Project Estimated Load Reductions

	Existing (lbs)		
UPLAND EROSION/RUNOFF	Total Sed (lbs)	Total N (lbs)	Total P (lbs)
Row Crops	969246	3618	348
Hay/Pasture	118607	765	72
High Density Urban	191	84	9
Low Density Urban	37280	163	27
Unpaved Roads	5835	25	2
Other	601953	2006	186
STREAMBANK EROSION	172668	9	4
GROUNDWATER/SUBSURFACE		15189	210
POINT SOURCE DISCHARGE		0	0
SEPTIC SYSTEMS		172	21
FARM ANIMALS		2856	416
TOTALS	**1905780**	**24887**	**1295**
	Future (lbs)		
LAND EROSION/RUNOFF	Total Sed (lbs)	Total N (lbs)	Total P (lbs)
Row Crops	908141	3366	328
Hay/Pasture	118607	765	72
High Density Urban	191	84	9
Low Density Urban	37280	163	27
Unpaved Roads	5835	25	2
Other	601953	2006	186
STREAMBANK EROSION	170885	9	4
GROUNDWATER/SUBSURFACE		14776	210
POINT SOURCE DISCHARGE		0	0
SEPTIC SYSTEMS		172	21
FARM ANIMALS		2737	403
TOTALS	**1842892**	**24103**	**1262**
PERCENT REDUCTIONS	3.3	14.2	33.7
TOTAL SCENARIO COST	$27,900.00		
Ag BMP Cost (%)	0.0		
WW Upgrade Cost (%)	0.0		
Urban BMP Cost (%)	0.0		
Stream Protection Cost (%)	100.0		

Unpaved Road Protection Cost (%)	0	

Pathogen Loads		
Source	**Existing (orgs/month)**	**Future (orgs/month)**
Farm Animals	2.980e+14	2.807e+14
WWTP	0.000e+00	0.000e+00
Septic Systems	4.089e+12	4.089e+12
Urban Areas	1.558e+16	1.558e+16
Wildlife	2.645e+11	2.645e+11
Totals	1.588e+16	1.587e+16
PERCENT REDUCTIONS		0.11
TOTAL SCENARIO COST	$27,900.00	

Site #44: Gaut Farm Project Estimated Load Reductions

	Existing (lbs)		
UPLAND EROSION/RUNOFF	Total Sed (lbs)	Total N (lbs)	Total P (lbs)
Row Crops	969246	3618	348
Hay/Pasture	118607	765	72
High Density Urban	191	84	9
Low Density Urban	37280	163	27
Unpaved Roads	5835	25	2
Other	601953	2006	186
STREAMBANK EROSION	172668	9	4
GROUNDWATER/SUBSURFACE		15189	210
POINT SOURCE DISCHARGE		0	0
SEPTIC SYSTEMS		172	21
FARM ANIMALS		2856	416
TOTALS	**1905780**	**24887**	**1295**

	Future (lbs)		
LAND EROSION/RUNOFF	Total Sed (lbs)	Total N (lbs)	Total P (lbs)
Row Crops	872830	3243	317
Hay/Pasture	118607	765	72
High Density Urban	191	84	9
Low Density Urban	37280	163	27
Unpaved Roads	5835	25	2
Other	601953	2006	186
STREAMBANK EROSION	167319	9	4
GROUNDWATER/SUBSURFACE		15186	210
POINT SOURCE DISCHARGE		0	0
SEPTIC SYSTEMS		172	21
FARM ANIMALS		2658	394
TOTALS	**1804015**	**24311**	**1242**
PERCENT REDUCTIONS	5.3	13.0	34.6
TOTAL SCENARIO COST	$81,631.50		
Ag BMP Cost (%)	0.4		
WW Upgrade Cost (%)	0.0		
Urban BMP Cost (%)	0.0		
Stream Protection Cost (%)	99.6		

Unpaved Road Protection Cost (%)	0	

Pathogen Loads		
Source	**Existing (orgs/month)**	**Future (orgs/month)**
Farm Animals	2.980e+14	2.738e+14
WWTP	0.000e+00	0.000e+00
Septic Systems	4.089e+12	4.089e+12
Urban Areas	1.558e+16	1.558e+16
Wildlife	2.645e+11	2.645e+11
Totals	1.588e+16	1.586e+16
PERCENT REDUCTIONS		0.15
TOTAL SCENARIO COST	$81,631.50	

Site #45: Vance Farm Project Estimated Load Reductions

	Existing (lbs)		
UPLAND EROSION/RUNOFF	Total Sed (lbs)	Total N (lbs)	Total P (lbs)
Row Crops	969246	3618	348
Hay/Pasture	118607	765	72
High Density Urban	191	84	9
Low Density Urban	37280	163	27
Unpaved Roads	5835	25	2
Other	601953	2006	186
STREAMBANK EROSION	172668	9	4
GROUNDWATER/SUBSURFACE		15189	210
POINT SOURCE DISCHARGE		0	0
SEPTIC SYSTEMS		172	21
FARM ANIMALS		2856	416
TOTALS	**1905780**	**24887**	**1295**
	Future (lbs)		
LAND EROSION/RUNOFF	Total Sed (lbs)	Total N (lbs)	Total P (lbs)
Row Crops	860759	3193	313
Hay/Pasture	118607	765	72
High Density Urban	191	84	9
Low Density Urban	37280	163	27
Unpaved Roads	5835	25	2
Other	601953	2006	186
STREAMBANK EROSION	169102	9	4
GROUNDWATER/SUBSURFACE		15185	210
POINT SOURCE DISCHARGE		0	0
SEPTIC SYSTEMS		172	21
FARM ANIMALS		2630	391
TOTALS	**1793727**	**24232**	**1235**
PERCENT REDUCTIONS	5.9	13.2	34.9
TOTAL SCENARIO COST	$55,531.50		
Ag BMP Cost (%)	0.6		
WW Upgrade Cost (%)	0.0		
Urban BMP Cost (%)	0.0		
Stream Protection Cost (%)	99.4		

Unpaved Road Protection Cost (%)	0

Pathogen Loads		
Source	**Existing (orgs/month)**	**Future (orgs/month)**
Farm Animals	2.980e+14	2.703e+14
WWTP	0.000e+00	0.000e+00
Septic Systems	4.089e+12	4.089e+12
Urban Areas	1.558e+16	1.558e+16
Wildlife	2.645e+11	2.645e+11
Totals	1.588e+16	1.586e+16
PERCENT REDUCTIONS		0.17
TOTAL SCENARIO COST	$55,531.50	

Site #53: East Huntingdon Gun Club Project Estimated Load Reductions

	Existing (lbs)		
UPLAND EROSION/RUNOFF	Total Sed (lbs)	Total N (lbs)	Total P (lbs)
Row Crops	969246	3618	348
Hay/Pasture	118607	765	72
High Density Urban	191	84	9
Low Density Urban	37280	163	27
Unpaved Roads	5835	25	2
Other	601953	2006	186
STREAMBANK EROSION	172668	9	4
GROUNDWATER/SUBSURFACE		15189	210
POINT SOURCE DISCHARGE		0	0
SEPTIC SYSTEMS		172	21
FARM ANIMALS		2856	416
TOTALS	**1905780**	**24887**	**1295**
	Future (lbs)		
LAND EROSION/RUNOFF	Total Sed (lbs)	Total N (lbs)	Total P (lbs)
Row Crops	920362	3417	332
Hay/Pasture	118607	765	72
High Density Urban	191	84	9
Low Density Urban	37280	163	27
Unpaved Roads	5835	25	2
Other	601953	2006	186
STREAMBANK EROSION	169102	9	4
GROUNDWATER/SUBSURFACE		14859	210
POINT SOURCE DISCHARGE		0	0
SEPTIC SYSTEMS		172	21
FARM ANIMALS		2760	405
TOTALS	**1853330**	**24260**	**1268**
PERCENT REDUCTIONS	2.8	13.6	33.4
TOTAL SCENARIO COST	$54,000.00		
Ag BMP Cost (%)	0.0		
WW Upgrade Cost (%)	0.0		
Urban BMP Cost (%)	0.0		
Stream Protection Cost (%)	100.0		

Unpaved Road Protection Cost (%)	0	

Pathogen Loads		
Source	**Existing (orgs/month)**	**Future (orgs/month)**
Farm Animals	2.980e+14	2.842e+14
WWTP	0.000e+00	0.000e+00
Septic Systems	4.089e+12	4.089e+12
Urban Areas	1.558e+16	1.558e+16
Wildlife	2.645e+11	2.645e+11
Totals	1.588e+16	1.587e+16
PERCENT REDUCTIONS		0.09
TOTAL SCENARIO COST	$54,000.00	

Site# 61: Fort Allen Farm Equipment Estimated Load Reductions

	Existing (lbs)		
UPLAND EROSION/RUNOFF	Total Sed (lbs)	Total N (lbs)	Total P (lbs)
Row Crops	706884	3056	251
Hay/Pasture	136972	2046	176
High Density Urban	22634	1910	206
Low Density Urban	58039	429	71
Unpaved Roads	1386	14	1
Other	427326	2261	153
STREAMBANK EROSION	970334	49	21
GROUNDWATER/SUBSURFACE		50305	595
POINT SOURCE DISCHARGE		23678	296
SEPTIC SYSTEMS		356	49
FARM ANIMALS		2154	401
TOTALS	**2323575**	**86258**	**2220**
	Future (lbs)		
LAND EROSION/RUNOFF	Total Sed (lbs)	Total N (lbs)	Total P (lbs)
Row Crops	692746	2989	246
Hay/Pasture	136082	2002	173
High Density Urban	22634	1910	206
Low Density Urban	58039	429	71
Unpaved Roads	0	0	0
Other	427326	2261	153
STREAMBANK EROSION	965793	49	21
GROUNDWATER/SUBSURFACE		50057	595
POINT SOURCE DISCHARGE		23678	296
SEPTIC SYSTEMS		356	49
FARM ANIMALS		2168	404
TOTALS	**2302620**	**85899**	**2214**
PERCENT REDUCTIONS	0.9	2.9	18.5
TOTAL SCENARIO COST	$61,344.00		
Ag BMP Cost (%)	56.0		
WW Upgrade Cost (%)	0.0		
Urban BMP Cost (%)	0.0		
Stream Protection Cost (%)	44.0		

Unpaved Road Protection Cost (%)	0	

Pathogen Loads		
Source	**Existing (orgs/month)**	**Future (orgs/month)**
Farm Animals	2.111e+14	2.076e+14
WWTP	0.000e+00	0.000e+00
Septic Systems	9.438e+12	9.438e+12
Urban Areas	1.606e+16	1.606e+16
Wildlife	6.761e+11	6.761e+11
Totals	1.628e+16	1.628e+16
PERCENT REDUCTIONS		0.02
TOTAL SCENARIO COST	$61,344.00	

Site # 76-79, 81: Jacobs Creek Flood Control Project Estimated Load Reductions

	Existing (lbs)		
UPLAND EROSION/RUNOFF	Total Sed (lbs)	Total N (lbs)	Total P (lbs)
Row Crops	706884	3056	251
Hay/Pasture	136972	2046	176
High Density Urban	22634	1910	206
Low Density Urban	58039	429	71
Unpaved Roads	1386	14	1
Other	427326	2261	153
STREAMBANK EROSION	970334	49	21
GROUNDWATER/SUBSURFACE		50305	595
POINT SOURCE DISCHARGE		23678	296
SEPTIC SYSTEMS		356	49
FARM ANIMALS		2154	401
TOTALS	**2323575**	**86258**	**2220**
	Future (lbs)		
LAND EROSION/RUNOFF	Total Sed (lbs)	Total N (lbs)	Total P (lbs)
Row Crops	706884	3056	251
Hay/Pasture	136972	2046	176
High Density Urban	22634	1910	206
Low Density Urban	58039	429	71
Unpaved Roads	0	0	0
Other	427326	2261	153
STREAMBANK EROSION	902219	46	20
GROUNDWATER/SUBSURFACE		50305	595
POINT SOURCE DISCHARGE		23678	296
SEPTIC SYSTEMS		356	49
FARM ANIMALS		2154	401
TOTALS	**2254074**	**86241**	**2218**
PERCENT REDUCTIONS	3.0	2.5	18.2
TOTAL SCENARIO COST	$396,000.00		
Ag BMP Cost (%)	0.0		
WW Upgrade Cost (%)	0.0		
Urban BMP Cost (%)	0.0		
Stream Protection Cost (%)	100.0		

Unpaved Road Protection Cost (%)	0	

Pathogen Loads		
Source	**Existing (orgs/month)**	**Future (orgs/month)**
Farm Animals	2.111e+14	2.111e+14
WWTP	0.000e+00	0.000e+00
Septic Systems	9.438e+12	9.438e+12
Urban Areas	1.606e+16	1.606e+16
Wildlife	6.761e+11	6.761e+11
Totals	1.628e+16	1.628e+16
PERCENT REDUCTIONS		0.00
TOTAL SCENARIO COST	$396,000.00	

Site# 80: Greenlick Run Farm Estimated Load Reductions

	Existing (lbs)		
UPLAND EROSION/RUNOFF	Total Sed (lbs)	Total N (lbs)	Total P (lbs)
Row Crops	706884	3056	251
Hay/Pasture	136972	2046	176
High Density Urban	22634	1910	206
Low Density Urban	58039	429	71
Unpaved Roads	1386	14	1
Other	427326	2261	153
STREAMBANK EROSION	970334	49	21
GROUNDWATER/SUBSURFACE		50305	595
POINT SOURCE DISCHARGE		23678	296
SEPTIC SYSTEMS		356	49
FARM ANIMALS		2154	401
TOTALS	**2323575**	**86258**	**2220**

	Future (lbs)		
LAND EROSION/RUNOFF	Total Sed (lbs)	Total N (lbs)	Total P (lbs)
Row Crops	706884	3056	251
Hay/Pasture	136972	2046	176
High Density Urban	22634	1910	206
Low Density Urban	58039	429	71
Unpaved Roads	0	0	0
Other	427326	2261	153
STREAMBANK EROSION	956711	48	21
GROUNDWATER/SUBSURFACE		50305	595
POINT SOURCE DISCHARGE		23678	296
SEPTIC SYSTEMS		356	49
FARM ANIMALS		2154	401
TOTALS	**2308566**	**86243**	**2219**
PERCENT REDUCTIONS	0.7	2.5	18.1
TOTAL SCENARIO COST	$79,200.00		
Ag BMP Cost (%)	0.0		
WW Upgrade Cost (%)	0.0		
Urban BMP Cost (%)	0.0		
Stream Protection Cost (%)	100.0		

Unpaved Road Protection Cost (%)	0	

Pathogen Loads		
Source	**Existing (orgs/month)**	**Future (orgs/month)**
Farm Animals	2.111e+14	2.111e+14
WWTP	0.000e+00	0.000e+00
Septic Systems	9.438e+12	9.438e+12
Urban Areas	1.606e+16	1.606e+16
Wildlife	6.761e+11	6.761e+11
Totals	1.628e+16	1.628e+16
PERCENT REDUCTIONS		0.00
TOTAL SCENARIO COST	$79,200.00	

Site #84: Moore and Moreford Project Estimated Load Reductions

	Existing (lbs)		
UPLAND EROSION/RUNOFF	Total Sed (lbs)	Total N (lbs)	Total P (lbs)
Row Crops	929766	3976	296
Hay/Pasture	99546	1485	114
High Density Urban	933	213	23
Low Density Urban	67388	322	53
Unpaved Roads	5085	28	2
Other	380531	1918	132
STREAMBANK EROSION	268489	13	6
GROUNDWATER/SUBSURFACE		27167	326
POINT SOURCE DISCHARGE		0	0
SEPTIC SYSTEMS		165	21
FARM ANIMALS		1237	277
TOTALS	**1751738**	**36524**	**1250**
	Future (lbs)		
LAND EROSION/RUNOFF	Total Sed (lbs)	Total N (lbs)	Total P (lbs)
Row Crops	860184	3648	276
Hay/Pasture	99546	1485	114
High Density Urban	933	213	23
Low Density Urban	67388	322	53
Unpaved Roads	5085	28	2
Other	380531	1918	132
STREAMBANK EROSION	252033	12	6
GROUNDWATER/SUBSURFACE		26291	326
POINT SOURCE DISCHARGE		0	0
SEPTIC SYSTEMS		165	21
FARM ANIMALS		1269	284
TOTALS	**1665700**	**35350**	**1236**
PERCENT REDUCTIONS	4.9	6.7	23.8
TOTAL SCENARIO COST	$106,800.00		
Ag BMP Cost (%)	0.0		
WW Upgrade Cost (%)	0.0		
Urban BMP Cost (%)	0.0		
Stream Protection Cost (%)	100.0		

Unpaved Road Protection Cost (%)	0	

Pathogen Loads		
Source	**Existing (orgs/month)**	**Future (orgs/month)**
Farm Animals	1.507e+14	1.402e+14
WWTP	0.000e+00	0.000e+00
Septic Systems	4.092e+12	4.092e+12
Urban Areas	2.151e+16	2.151e+16
Wildlife	1.481e+11	1.481e+11
Totals	2.167e+16	2.166e+16
PERCENT REDUCTIONS		0.05
TOTAL SCENARIO COST	$106,800.00	

Site# 87 Estimated Load Reductions

	Existing (lbs)		
UPLAND EROSION/RUNOFF	Total Sed (lbs)	Total N (lbs)	Total P (lbs)
Row Crops	929766	3976	296
Hay/Pasture	99546	1485	114
High Density Urban	933	213	23
Low Density Urban	67388	322	53
Unpaved Roads	5085	28	2
Other	380531	1918	132
STREAMBANK EROSION	268489	13	6
GROUNDWATER/SUBSURFACE		27167	326
POINT SOURCE DISCHARGE		0	0
SEPTIC SYSTEMS		165	21
FARM ANIMALS		1237	277
TOTALS	**1751738**	**36524**	**1250**
	Future (lbs)		
LAND EROSION/RUNOFF	Total Sed (lbs)	Total N (lbs)	Total P (lbs)
Row Crops	894975	3812	286
Hay/Pasture	99546	1485	114
High Density Urban	933	213	23
Low Density Urban	67388	322	53
Unpaved Roads	5085	28	2
Other	380531	1918	132
STREAMBANK EROSION	260261	13	6
GROUNDWATER/SUBSURFACE		26729	326
POINT SOURCE DISCHARGE		0	0
SEPTIC SYSTEMS		165	21
FARM ANIMALS		1203	271
TOTALS	**1708719**	**35888**	**1234**
PERCENT REDUCTIONS	2.5	5.0	23.0
TOTAL SCENARIO COST	$53,400.00		
Ag BMP Cost (%)	0.0		
WW Upgrade Cost (%)	0.0		
Urban BMP Cost (%)	0.0		
Stream Protection Cost (%)	100.0		

Unpaved Road Protection Cost (%)	0	

Pathogen Loads		
Source	**Existing (orgs/month)**	**Future (orgs/month)**
Farm Animals	1.507e+14	1.454e+14
WWTP	0.000e+00	0.000e+00
Septic Systems	4.092e+12	4.092e+12
Urban Areas	2.151e+16	2.151e+16
Wildlife	1.481e+11	1.481e+11
Totals	2.167e+16	2.166e+16
PERCENT REDUCTIONS		0.02
TOTAL SCENARIO COST	$53,400.00	

Site# 88 Estimated Load Reductions

	Existing (lbs)		
UPLAND EROSION/RUNOFF	Total Sed (lbs)	Total N (lbs)	Total P (lbs)
Row Crops	929766	3976	296
Hay/Pasture	99546	1485	114
High Density Urban	933	213	23
Low Density Urban	67388	322	53
Unpaved Roads	5085	28	2
Other	380531	1918	132
STREAMBANK EROSION	268489	13	6
GROUNDWATER/SUBSURFACE		27167	326
POINT SOURCE DISCHARGE		0	0
SEPTIC SYSTEMS		165	21
FARM ANIMALS		1237	277
TOTALS	**1751738**	**36524**	**1250**
	Future (lbs)		
LAND EROSION/RUNOFF	Total Sed (lbs)	Total N (lbs)	Total P (lbs)
Row Crops	662341	2781	211
Hay/Pasture	99546	1485	114
High Density Urban	933	213	23
Low Density Urban	67388	322	53
Unpaved Roads	5085	28	2
Other	380531	1918	132
STREAMBANK EROSION	232286	11	5
GROUNDWATER/SUBSURFACE		26291	326
POINT SOURCE DISCHARGE		0	0
SEPTIC SYSTEMS		165	21
FARM ANIMALS		1174	266
TOTALS	**1448111**	**34388**	**1154**
PERCENT REDUCTIONS	6.0	6.7	23.8
TOTAL SCENARIO COST	$124,800.00		
Ag BMP Cost (%)	0.0		
WW Upgrade Cost (%)	0.0		
Urban BMP Cost (%)	0.0		
Stream Protection Cost (%)	100.0		

Unpaved Road Protection Cost (%)	0	

Pathogen Loads		
Source	**Existing (orgs/month)**	**Future (orgs/month)**
Farm Animals	1.507e+14	1.363e+14
WWTP	0.000e+00	0.000e+00
Septic Systems	4.092e+12	4.092e+12
Urban Areas	2.151e+16	2.151e+16
Wildlife	1.481e+11	1.481e+11
Totals	2.167e+16	2.166e+16
PERCENT REDUCTIONS		0.07
TOTAL SCENARIO COST	$124,800.00	

Site# 90 Estimated Load Reductions

	Existing (lbs)		
UPLAND EROSION/RUNOFF	Total Sed (lbs)	Total N (lbs)	Total P (lbs)
Row Crops	929766	3976	296
Hay/Pasture	99546	1485	114
High Density Urban	933	213	23
Low Density Urban	67388	322	53
Unpaved Roads	5085	28	2
Other	380531	1918	132
STREAMBANK EROSION	268489	13	6
GROUNDWATER/SUBSURFACE		27167	326
POINT SOURCE DISCHARGE		0	0
SEPTIC SYSTEMS		165	21
FARM ANIMALS		1237	277
TOTALS	**1751738**	**36524**	**1250**
	Future (lbs)		
LAND EROSION/RUNOFF	Total Sed (lbs)	Total N (lbs)	Total P (lbs)
Row Crops	825392	3483	266
Hay/Pasture	99546	1485	114
High Density Urban	933	213	23
Low Density Urban	67388	322	53
Unpaved Roads	5085	28	2
Other	380531	1918	132
STREAMBANK EROSION	242160	12	5
GROUNDWATER/SUBSURFACE		25852	326
POINT SOURCE DISCHARGE		0	0
SEPTIC SYSTEMS		165	21
FARM ANIMALS		1131	257
TOTALS	**1621035**	**34609**	**1199**
PERCENT REDUCTIONS	7.5	8.3	24.6
TOTAL SCENARIO COST	$116,400.00		
Ag BMP Cost (%)	0.0		
WW Upgrade Cost (%)	0.0		
Urban BMP Cost (%)	0.0		
Stream Protection Cost (%)	100.0		

Unpaved Road Protection Cost (%)	0	

Pathogen Loads		
Source	**Existing (orgs/month)**	**Future (orgs/month)**
Farm Animals	1.507e+14	1.329e+14
WWTP	0.000e+00	0.000e+00
Septic Systems	4.092e+12	4.092e+12
Urban Areas	2.151e+16	2.151e+16
Wildlife	1.481e+11	1.481e+11
Totals	2.167e+16	2.165e+16
PERCENT REDUCTIONS		0.08
TOTAL SCENARIO COST	$116,400.00	

Site# 103 Estimated Load Reductions

	Existing (lbs)		
UPLAND EROSION/RUNOFF	Total Sed (lbs)	Total N (lbs)	Total P (lbs)
Row Crops	422783	2124	160
Hay/Pasture	29852	542	45
High Density Urban	2692	599	65
Low Density Urban	79219	474	78
Unpaved Roads	0	0	0
Other	285690	1445	99
STREAMBANK EROSION	306453	16	7
GROUNDWATER/SUBSURFACE		14039	225
POINT SOURCE DISCHARGE		7159	90
SEPTIC SYSTEMS		87	11
FARM ANIMALS		0	0
TOTALS	**1126689**	**26485**	**780**

	Future (lbs)		
LAND EROSION/RUNOFF	Total Sed (lbs)	Total N (lbs)	Total P (lbs)
Row Crops	422783	2124	160
Hay/Pasture	29852	542	45
High Density Urban	2692	599	65
Low Density Urban	29095	143	34
Unpaved Roads	0	0	0
Other	285690	1445	99
STREAMBANK EROSION	306453	16	7
GROUNDWATER/SUBSURFACE		14039	225
POINT SOURCE DISCHARGE		7159	90
SEPTIC SYSTEMS		87	11
FARM ANIMALS		0	0
TOTALS	**1076565**	**26154**	**736**
PERCENT REDUCTIONS	4.5	1.3	5.7
TOTAL SCENARIO COST	$160,200.00		
Ag BMP Cost (%)	0.0		
WW Upgrade Cost (%)	0.0		
Urban BMP Cost (%)	0.0		
Stream Protection Cost (%)	100.0		

Unpaved Road Protection Cost (%)	0	

Pathogen Loads		
Source	**Existing (orgs/month)**	**Future (orgs/month)**
Farm Animals	0.000e+00	0.000e+00
WWTP	0.000e+00	0.000e+00
Septic Systems	2.098e+12	2.098e+12
Urban Areas	2.237e+16	1.454e+16
Wildlife	1.437e+11	1.437e+11
Totals	2.237e+16	1.455e+16
PERCENT REDUCTIONS		34.99
TOTAL SCENARIO COST	$160,200.00	

Site# 106: State Road to Slope Hill Road Estimated Load Reductions

	Existing (lbs)		
UPLAND EROSION/RUNOFF	Total Sed (lbs)	Total N (lbs)	Total P (lbs)
Row Crops	422783	2124	160
Hay/Pasture	29852	542	45
High Density Urban	2692	599	65
Low Density Urban	79219	474	78
Unpaved Roads	0	0	0
Other	285690	1445	99
STREAMBANK EROSION	306453	16	7
GROUNDWATER/SUBSURFACE		14039	225
POINT SOURCE DISCHARGE		7159	90
SEPTIC SYSTEMS		87	11
FARM ANIMALS		0	0
TOTALS	**1126689**	**26485**	**780**
	Future (lbs)		
LAND EROSION/RUNOFF	Total Sed (lbs)	Total N (lbs)	Total P (lbs)
Row Crops	422783	2124	160
Hay/Pasture	29852	542	45
High Density Urban	0	0	0
Low Density Urban	45803	253	49
Unpaved Roads	0	0	0
Other	285690	1445	99
STREAMBANK EROSION	306453	16	7
GROUNDWATER/SUBSURFACE		14039	225
POINT SOURCE DISCHARGE		7159	90
SEPTIC SYSTEMS		112	14
FARM ANIMALS		0	0
TOTALS	**1090581**	**25690**	**689**
PERCENT REDUCTIONS	3.2	3.0	11.7
TOTAL SCENARIO COST	$133,500.00		
Ag BMP Cost (%)	0.0		
WW Upgrade Cost (%)	0.0		
Urban BMP Cost (%)	0.0		
Stream Protection Cost (%)	100.0		

Unpaved Road Protection Cost (%)	0	

Pathogen Loads		
Source	**Existing (orgs/month)**	**Future (orgs/month)**
Farm Animals	0.000e+00	0.000e+00
WWTP	0.000e+00	0.000e+00
Septic Systems	2.098e+12	2.701e+12
Urban Areas	2.237e+16	1.584e+16
Wildlife	1.437e+11	1.437e+11
Totals	2.237e+16	1.585e+16
PERCENT REDUCTIONS		29.17
TOTAL SCENARIO COST	$133,500.00	

Site #110: Willow Park Stabilization Estimated Load Reductions

	Existing (lbs)		
UPLAND EROSION/RUNOFF	Total Sed (lbs)	Total N (lbs)	Total P (lbs)
Row Crops	422783	2124	160
Hay/Pasture	29852	542	45
High Density Urban	2692	599	65
Low Density Urban	79219	474	78
Unpaved Roads	0	0	0
Other	285690	1445	99
STREAMBANK EROSION	306453	16	7
GROUNDWATER/SUBSURFACE		14039	225
POINT SOURCE DISCHARGE		7159	90
SEPTIC SYSTEMS		87	11
FARM ANIMALS		0	0
TOTALS	**1126689**	**26485**	**780**
	Future (lbs)		
LAND EROSION/RUNOFF	Total Sed (lbs)	Total N (lbs)	Total P (lbs)
Row Crops	422783	2124	160
Hay/Pasture	29852	542	45
High Density Urban	2692	599	65
Low Density Urban	45803	253	49
Unpaved Roads	0	0	0
Other	285690	1445	99
STREAMBANK EROSION	306453	16	7
GROUNDWATER/SUBSURFACE		14039	225
POINT SOURCE DISCHARGE		7159	90
SEPTIC SYSTEMS		87	11
FARM ANIMALS		0	0
TOTALS	**1093273**	**26264**	**751**
PERCENT REDUCTIONS	3.0	0.8	3.8
TOTAL SCENARIO COST	$106,800.00		
Ag BMP Cost (%)	0.0		
WW Upgrade Cost (%)	0.0		
Urban BMP Cost (%)	0.0		
Stream Protection Cost (%)	100.0		

Unpaved Road Protection Cost (%)	0	

Pathogen Loads		
Source	**Existing (orgs/month)**	**Future (orgs/month)**
Farm Animals	0.000e+00	0.000e+00
WWTP	0.000e+00	0.000e+00
Septic Systems	2.098e+12	2.098e+12
Urban Areas	2.237e+16	1.715e+16
Wildlife	1.437e+11	1.437e+11
Totals	2.237e+16	1.716e+16
PERCENT REDUCTIONS		23.32
TOTAL SCENARIO COST	$106,800.00	

Site# 113: Glick Bros. Farm Estimated Load Reductions

	Existing (lbs)		
UPLAND EROSION/RUNOFF	Total Sed (lbs)	Total N (lbs)	Total P (lbs)
Row Crops	422783	2124	160
Hay/Pasture	29852	542	45
High Density Urban	2692	599	65
Low Density Urban	79219	474	78
Unpaved Roads	0	0	0
Other	285690	1445	99
STREAMBANK EROSION	306453	16	7
GROUNDWATER/SUBSURFACE		14039	225
POINT SOURCE DISCHARGE		7159	90
SEPTIC SYSTEMS		87	11
FARM ANIMALS		0	0
TOTALS	**1126689**	**26485**	**780**
	Future (lbs)		
LAND EROSION/RUNOFF	Total Sed (lbs)	Total N (lbs)	Total P (lbs)
Row Crops	262504	1319	103
Hay/Pasture	29852	542	45
High Density Urban	2692	599	65
Low Density Urban	79219	474	78
Unpaved Roads	0	0	0
Other	285690	1445	99
STREAMBANK EROSION	293220	15	7
GROUNDWATER/SUBSURFACE		14035	225
POINT SOURCE DISCHARGE		7159	90
SEPTIC SYSTEMS		87	11
FARM ANIMALS		0	0
TOTALS	**953177**	**25675**	**723**
PERCENT REDUCTIONS	15.4	3.1	7.3
TOTAL SCENARIO COST	$60,856.00		
Ag BMP Cost (%)	9.3		
WW Upgrade Cost (%)	0.0		
Urban BMP Cost (%)	0.0		
Stream Protection Cost (%)	90.7		

Unpaved Road Protection Cost (%)	0	

Pathogen Loads		
Source	**Existing (orgs/month)**	**Future (orgs/month)**
Farm Animals	0.000e+00	0.000e+00
WWTP	0.000e+00	0.000e+00
Septic Systems	2.098e+12	2.098e+12
Urban Areas	2.237e+16	2.237e+16
Wildlife	1.437e+11	1.437e+11
Totals	2.237e+16	2.237e+16
PERCENT REDUCTIONS		0.00
TOTAL SCENARIO COST	$60,856.00	

Site #122 Pritz Feed Mill Farm Estimated Load Reductions

	Existing (lbs)		
UPLAND EROSION/RUNOFF	Total Sed (lbs)	Total N (lbs)	Total P (lbs)
Row Crops	787809	4020	336
Hay/Pasture	132641	1975	168
High Density Urban	589	36	4
Low Density Urban	71912	198	33
Unpaved Roads	6578	32	2
Other	395522	1748	119
STREAMBANK EROSION	243307	12	5
GROUNDWATER/SUBSURFACE		41339	542
POINT SOURCE DISCHARGE		0	0
SEPTIC SYSTEMS		231	32
FARM ANIMALS		7586	838
TOTALS	**1638358**	**57177**	**2079**
	Future (lbs)		
LAND EROSION/RUNOFF	Total Sed (lbs)	Total N (lbs)	Total P (lbs)
Row Crops	776799	3958	332
Hay/Pasture	132296	1958	167
High Density Urban	589	36	4
Low Density Urban	71912	198	33
Unpaved Roads	6578	32	2
Other	395522	1748	119
STREAMBANK EROSION	240418	12	5
GROUNDWATER/SUBSURFACE		41081	542
POINT SOURCE DISCHARGE		0	0
SEPTIC SYSTEMS		231	32
FARM ANIMALS		7505	832
TOTALS	**1624114**	**56758**	**2067**
PERCENT REDUCTIONS	0.9	13.9	40.6
TOTAL SCENARIO COST	$63,206.40		
Ag BMP Cost (%)	15.5		
WW Upgrade Cost (%)	0.0		
Urban BMP Cost (%)	0.0		
Stream Protection Cost (%)	84.5		

Unpaved Road Protection Cost (%)	0	

Pathogen Loads		
Source	**Existing (orgs/month)**	**Future (orgs/month)**
Farm Animals	5.542e+14	5.476e+14
WWTP	0.000e+00	0.000e+00
Septic Systems	6.079e+12	6.079e+12
Urban Areas	1.899e+16	1.899e+16
Wildlife	5.713e+11	5.713e+11
Totals	1.955e+16	1.955e+16
PERCENT REDUCTIONS		0.03
TOTAL SCENARIO COST	$63,206.40	

Site #135: Zelmore Farm Estimated Load Reductions

	Existing (lbs)		
UPLAND EROSION/RUNOFF	Total Sed (lbs)	Total N (lbs)	Total P (lbs)
Row Crops	787809	4020	336
Hay/Pasture	132641	1975	168
High Density Urban	589	36	4
Low Density Urban	71912	198	33
Unpaved Roads	6578	32	2
Other	395522	1748	119
STREAMBANK EROSION	243307	12	5
GROUNDWATER/SUBSURFACE		41339	542
POINT SOURCE DISCHARGE		0	0
SEPTIC SYSTEMS		231	32
FARM ANIMALS		7586	838
TOTALS	**1638358**	**57177**	**2079**
	Future (lbs)		
LAND EROSION/RUNOFF	Total Sed (lbs)	Total N (lbs)	Total P (lbs)
Row Crops	776799	3958	332
Hay/Pasture	132296	1958	167
High Density Urban	589	36	4
Low Density Urban	71912	198	33
Unpaved Roads	6578	32	2
Other	395522	1748	119
STREAMBANK EROSION	241862	12	5
GROUNDWATER/SUBSURFACE		41081	542
POINT SOURCE DISCHARGE		0	0
SEPTIC SYSTEMS		231	32
FARM ANIMALS		7504	832
TOTALS	**1625558**	**56758**	**2067**
PERCENT REDUCTIONS	0.8	13.9	40.6
TOTAL SCENARIO COST	$36,806.40		
Ag BMP Cost (%)	26.6		
WW Upgrade Cost (%)	0.0		
Urban BMP Cost (%)	0.0		
Stream Protection Cost (%)	73.4		

Unpaved Road Protection Cost (%)	0	

Pathogen Loads		
Source	**Existing (orgs/month)**	**Future (orgs/month)**
Farm Animals	5.542e+14	5.476e+14
WWTP	0.000e+00	0.000e+00
Septic Systems	6.079e+12	6.079e+12
Urban Areas	1.899e+16	1.899e+16
Wildlife	5.713e+11	5.713e+11
Totals	1.955e+16	1.955e+16
PERCENT REDUCTIONS		0.03
TOTAL SCENARIO COST	$36,806.40	

Site #136: Kitz Farm Estimated Load Reductions

	Existing (lbs)		
UPLAND EROSION/RUNOFF	Total Sed (lbs)	Total N (lbs)	Total P (lbs)
Row Crops	787809	4020	336
Hay/Pasture	132641	1975	168
High Density Urban	589	36	4
Low Density Urban	71912	198	33
Unpaved Roads	6578	32	2
Other	395522	1748	119
STREAMBANK EROSION	243307	12	5
GROUNDWATER/SUBSURFACE		41339	542
POINT SOURCE DISCHARGE		0	0
SEPTIC SYSTEMS		231	32
FARM ANIMALS		7586	838
TOTALS	**1638358**	**57177**	**2079**
	Future (lbs)		
LAND EROSION/RUNOFF	Total Sed (lbs)	Total N (lbs)	Total P (lbs)
Row Crops	771293	3927	330
Hay/Pasture	132296	1958	167
High Density Urban	589	36	4
Low Density Urban	71912	198	33
Unpaved Roads	6578	32	2
Other	395522	1748	119
STREAMBANK EROSION	232328	12	5
GROUNDWATER/SUBSURFACE		40951	542
POINT SOURCE DISCHARGE		0	0
SEPTIC SYSTEMS		231	32
FARM ANIMALS		7419	818
TOTALS	**1610518**	**56512**	**2051**
PERCENT REDUCTIONS	1.7	14.1	40.7
TOTAL SCENARIO COST	$84,506.40		
Ag BMP Cost (%)	11.6		
WW Upgrade Cost (%)	0.0		
Urban BMP Cost (%)	0.0		
Stream Protection Cost (%)	88.4		

Unpaved Road Protection Cost (%)	0

Pathogen Loads		
Source	**Existing (orgs/month)**	**Future (orgs/month)**
Farm Animals	5.542e+14	5.360e+14
WWTP	0.000e+00	0.000e+00
Septic Systems	6.079e+12	6.079e+12
Urban Areas	1.899e+16	1.899e+16
Wildlife	5.713e+11	5.713e+11
Totals	1.955e+16	1.954e+16
PERCENT REDUCTIONS		0.09
TOTAL SCENARIO COST	$84,506.40	

Site #142 – 143: Hutter Farm Estimated Load Reductions

	Existing (lbs)		
UPLAND EROSION/RUNOFF	Total Sed (lbs)	Total N (lbs)	Total P (lbs)
Row Crops	787809	4020	336
Hay/Pasture	132641	1975	168
High Density Urban	589	36	4
Low Density Urban	71912	198	33
Unpaved Roads	6578	32	2
Other	395522	1748	119
STREAMBANK EROSION	243307	12	5
GROUNDWATER/SUBSURFACE		41339	542
POINT SOURCE DISCHARGE		0	0
SEPTIC SYSTEMS		231	32
FARM ANIMALS		7586	838
TOTALS	**1638358**	**57177**	**2079**

	Future (lbs)		
LAND EROSION/RUNOFF	Total Sed (lbs)	Total N (lbs)	Total P (lbs)
Row Crops	727252	3679	313
Hay/Pasture	130917	1890	162
High Density Urban	589	36	4
Low Density Urban	71912	198	33
Unpaved Roads	6578	32	2
Other	395522	1748	119
STREAMBANK EROSION	238973	12	5
GROUNDWATER/SUBSURFACE		39918	542
POINT SOURCE DISCHARGE		0	0
SEPTIC SYSTEMS		231	32
FARM ANIMALS		6632	729
TOTALS	**1571743**	**54376**	**1941**
PERCENT REDUCTIONS	4.1	16.5	41.7
TOTAL SCENARIO COST	$183,582.00		
Ag BMP Cost (%)	26.7		
WW Upgrade Cost (%)	0.0		
Urban BMP Cost (%)	0.0		
Stream Protection Cost (%)	10.0		

Unpaved Road Protection Cost (%)	0	

Pathogen Loads		
Source	**Existing (orgs/month)**	**Future (orgs/month)**
Farm Animals	5.542e+14	4.874e+14
WWTP	0.000e+00	0.000e+00
Septic Systems	6.079e+12	6.079e+12
Urban Areas	1.899e+16	1.899e+16
Wildlife	5.713e+11	5.713e+11
Totals	1.955e+16	1.949e+16
PERCENT REDUCTIONS		0.34
TOTAL SCENARIO COST	$183,582.00	

Jacobs Creek 100% Stormwater Estimated Load Reductions

	Existing (lbs)		
UPLAND EROSION/RUNOFF	Total Sed (lbs)	Total N (lbs)	Total P (lbs)
Row Crops	706884	3056	251
Hay/Pasture	136972	2046	176
High Density Urban	22634	1910	206
Low Density Urban	58039	429	71
Unpaved Roads	1386	14	1
Other	427326	2261	153
STREAMBANK EROSION	970334	49	21
GROUNDWATER/SUBSURFACE		50305	595
POINT SOURCE DISCHARGE		23678	296
SEPTIC SYSTEMS		356	49
FARM ANIMALS		2154	401
TOTALS	**2323575**	**86258**	**2220**
	Future (lbs)		
LAND EROSION/RUNOFF	Total Sed (lbs)	Total N (lbs)	Total P (lbs)
Row Crops	706884	3056	251
Hay/Pasture	136972	2046	176
High Density Urban	0	0	0
Low Density Urban	0	0	0
Unpaved Roads	0	0	0
Other	427326	2261	153
STREAMBANK EROSION	970334	49	21
GROUNDWATER/SUBSURFACE		50305	595
POINT SOURCE DISCHARGE		23678	296
SEPTIC SYSTEMS		356	49
FARM ANIMALS		2154	401
TOTALS	**2241516**	**83905**	**1942**
PERCENT REDUCTIONS	3.5	5.2	30.6
TOTAL SCENARIO COST	$1,709,070.00		
Ag BMP Cost (%)	0.0		
WW Upgrade Cost (%)	0.0		
Urban BMP Cost (%)	60.9		
Stream Protection Cost (%)	39.1		

Unpaved Road Protection Cost (%)	0	

Pathogen Loads		
Source	**Existing (orgs/month)**	**Future (orgs/month)**
Farm Animals	2.111e+14	2.111e+14
WWTP	0.000e+00	0.000e+00
Septic Systems	9.438e+12	9.438e+12
Urban Areas	1.606e+16	4.062e+15
Wildlife	6.761e+11	6.761e+11
Totals	1.628e+16	4.284e+15
PERCENT REDUCTIONS		73.69
TOTAL SCENARIO COST	$1,709,070.00	

Stauffer Watershed 100% Stormwater Estimated Load Reductions

	Existing (lbs)		
UPLAND EROSION/RUNOFF	Total Sed (lbs)	Total N (lbs)	Total P (lbs)
Row Crops	969246	3618	348
Hay/Pasture	118607	765	72
High Density Urban	191	84	9
Low Density Urban	37280	163	27
Unpaved Roads	5835	25	2
Other	601953	2006	186
STREAMBANK EROSION	172668	9	4
GROUNDWATER/SUBSURFACE		15189	210
POINT SOURCE DISCHARGE		0	0
SEPTIC SYSTEMS		172	21
FARM ANIMALS		2856	416
TOTALS	**1905780**	**24887**	**1295**

	Future (lbs)		
LAND EROSION/RUNOFF	Total Sed (lbs)	Total N (lbs)	Total P (lbs)
Row Crops	969246	3618	348
Hay/Pasture	118607	765	72
High Density Urban	18	45	4
Low Density Urban	0	0	0
Unpaved Roads	5835	25	2
Other	601953	2006	186
STREAMBANK EROSION	172668	9	4
GROUNDWATER/SUBSURFACE		15189	210
POINT SOURCE DISCHARGE		0	0
SEPTIC SYSTEMS		172	21
FARM ANIMALS		2856	416
TOTALS	**1868327**	**24685**	**1263**
PERCENT REDUCTIONS	2.0	12.3	34.6
TOTAL SCENARIO COST	$1,362,990.00		
Ag BMP Cost (%)	0.0		
WW Upgrade Cost (%)	0.0		
Urban BMP Cost (%)	64.7		
Stream Protection Cost (%)	35.3		

Unpaved Road Protection Cost (%)	0	

Pathogen Loads		
Source	**Existing (orgs/month)**	**Future (orgs/month)**
Farm Animals	2.980e+14	2.980e+14
WWTP	0.000e+00	0.000e+00
Septic Systems	4.089e+12	4.089e+12
Urban Areas	1.558e+16	1.186e+15
Wildlife	2.645e+11	2.645e+11
Totals	1.588e+16	1.489e+15
PERCENT REDUCTIONS		90.63
TOTAL SCENARIO COST	$1,362,990.00	

Sherrick Run 100% Stormwater Estimated Load Reductions

	Existing (lbs)		
UPLAND EROSION/RUNOFF	Total Sed (lbs)	Total N (lbs)	Total P (lbs)
Row Crops	929766	3976	296
Hay/Pasture	99546	1485	114
High Density Urban	933	213	23
Low Density Urban	67388	322	53
Unpaved Roads	5085	28	2
Other	380531	1918	132
STREAMBANK EROSION	268489	13	6
GROUNDWATER/SUBSURFACE		27167	326
POINT SOURCE DISCHARGE		0	0
SEPTIC SYSTEMS		165	21
FARM ANIMALS		1237	277
TOTALS	**1751738**	**36524**	**1250**
	Future (lbs)		
LAND EROSION/RUNOFF	Total Sed (lbs)	Total N (lbs)	Total P (lbs)
Row Crops	929766	3976	296
Hay/Pasture	99546	1485	114
High Density Urban	849	125	10
Low Density Urban	22336	67	14
Unpaved Roads	5085	28	2
Other	380531	1918	132
STREAMBANK EROSION	268489	13	6
GROUNDWATER/SUBSURFACE		27167	326
POINT SOURCE DISCHARGE		0	0
SEPTIC SYSTEMS		165	21
FARM ANIMALS		1237	277
TOTALS	**1706602**	**36181**	**1199**
PERCENT REDUCTIONS	2.6	4.3	26.3
TOTAL SCENARIO COST	$998,140.00		
Ag BMP Cost (%)	0.0		
WW Upgrade Cost (%)	0.0		
Urban BMP Cost (%)	86.6		
Stream Protection Cost (%)	13.4		

Unpaved Road Protection Cost (%)	0	

Pathogen Loads		
Source	**Existing (orgs/month)**	**Future (orgs/month)**
Farm Animals	1.507e+14	1.507e+14
WWTP	0.000e+00	0.000e+00
Septic Systems	4.092e+12	4.092e+12
Urban Areas	2.151e+16	6.645e+15
Wildlife	1.481e+11	1.481e+11
Totals	2.167e+16	6.800e+15
PERCENT REDUCTIONS		68.62
TOTAL SCENARIO COST	$998,140.00	

Shupe 100% Stormwater Estimated Load Reductions

	Existing (lbs)		
UPLAND EROSION/RUNOFF	Total Sed (lbs)	Total N (lbs)	Total P (lbs)
Row Crops	422783	2124	160
Hay/Pasture	29852	542	45
High Density Urban	2692	599	65
Low Density Urban	79219	474	78
Unpaved Roads	0	0	0
Other	285690	1445	99
STREAMBANK EROSION	306453	16	7
GROUNDWATER/SUBSURFACE		14039	225
POINT SOURCE DISCHARGE		7159	90
SEPTIC SYSTEMS		87	11
FARM ANIMALS		0	0
TOTALS	**1126689**	**26485**	**780**
	Future (lbs)		
LAND EROSION/RUNOFF	Total Sed (lbs)	Total N (lbs)	Total P (lbs)
Row Crops	422783	2124	160
Hay/Pasture	29852	542	45
High Density Urban	0	0	0
Low Density Urban	0	0	0
Unpaved Roads	0	0	0
Other	285690	1445	99
STREAMBANK EROSION	306453	16	7
GROUNDWATER/SUBSURFACE		14039	225
POINT SOURCE DISCHARGE		7159	90
SEPTIC SYSTEMS		87	11
FARM ANIMALS		0	0
TOTALS	**1044778**	**25412**	**637**
PERCENT REDUCTIONS	7.3	4.1	18.3
TOTAL SCENARIO COST	$2,250,800.00		
Ag BMP Cost (%)	0.0		
WW Upgrade Cost (%)	0.0		
Urban BMP Cost (%)	85.8		
Stream Protection Cost (%)	14.2		

Unpaved Road Protection Cost (%)	0	

Pathogen Loads		
Source	**Existing (orgs/month)**	**Future (orgs/month)**
Farm Animals	0.000e+00	0.000e+00
WWTP	0.000e+00	0.000e+00
Septic Systems	2.098e+12	2.098e+12
Urban Areas	2.237e+16	1.735e+15
Wildlife	1.437e+11	1.437e+11
Totals	2.237e+16	1.738e+15
PERCENT REDUCTIONS		92.23
TOTAL SCENARIO COST	$2,250,800.00	

APPENDIX B: TU ASSESSMENT REPORT

Assessment of AMD inflows top Sherrick Run and Shupe Run
Final Report

Prepared by Hedin Environmental through the TU Technical Assistance Program

Scope of Work

Jacobs Creek in Westmoreland County is degraded by AMD-polluted inflow from Sherrick Run and Shupe Run. The Jacobs Creek Watershed Association requested through the Trout Unlimited Technical Assistance program an assessment of the AMD-polluted streams and remediation recommendations. The request was approved. This is the final report for the assessment.

Sherrick Run Discharge

Sherrick Run is a tributary stream of Jacobs Creek originating northwest of Mt. Pleasant and flowing south along U.S. 119 into Jacobs Creek. The location of the discharge is shown in Figure 1. The Sherrick Run discharge is located at stream's edge on the west side of U.S. 119 southeast of Mt. Pleasant. The discharge is located 6,600 feet from the mouth of Sherrick Run. In years with normal precipitation the discharge occurs as one point discharge (Photo A). During periods of high precipitation several additional discharges develop along the stream bank within 100 ft of the primary flow. It is possible that there are other discharges that flow directly into the stream that cannot be detected with a visual assessment.

Table 1 shows the results of sampling. The discharge has low pH and contains 60-80 mg/L acidity and 7-11 mg/L Al. Abandoned unflooded deep mines in the Pittsburgh coal seam in SW PA commonly produce low pH water with Al. This discharge is less contaminated than others that have been sampled in the area.

The main discharge is located within 10 feet of the stream (Photo A). There is less than one foot elevation between the discharge and the stream. The discharge flows directly into the stream. At this location the stream is spread out and has developed wetland characteristics (Photo B). The stream is turbid with a white solid that is aluminum hydroxide. The solid forms when dissolved Al contained in the discharge mixes with alkaline stream flow (from upstream) and the pH of the mixture is greater than 4.5.

The chemistry of the Sherrick Run AMD is not severe. Similar discharges are being treated passively throughout PA. The typical passive system would consist of a vertical flow pond followed by a settling pond. The vertical flow pond (VFP) would be constructed with 3-4 ft of limestone aggregate overlain with 1 ft of alkaline organic substrate. An underdrain plumbing system would cause water to flow from the surface down through the organic substrate and limestone. These alkaline substrates would

neutralize the acidity and generate additional alkalinity. Aluminum, which is insoluble under alkaline conditions, would be retained within the substrates. A settling pond would provide time for oxidation and precipitation of residual metals.

A VFP/settling pond passive system requires at least 10 feet of elevation difference between the collected AMD discharge and the final treatment system effluent. The discharge is located only several inches above the stream. In order to create sufficient head, the discharge would need to be piped downstream. However, the downstream areas are developed with commercial and industrial businesses. There is not a suitable site located close the discharge. There is ample room in the hay field above the discharge. One option would be to collect the AMD in a small sump and pump it to a treatment system constructed in the field. Because the pumping would only involve a 20-30 foot lift, the cost would not be exorbitant. The annual electrical costs would likely be less than $1000 per year. Maintenance of the pumping system would likely be more expensive. It is likely that the operation and maintenance of a pumping system would cost $5,000 per year.

There is a gas well in the field that has a pump jack. While it is unlikely that this pump could also be used to pump mine water, it is possible that the company that maintains it would be able to maintain an AMD pump for a reasonable cost.

Table 1. Results of samples collected from the AMD discharge and Sherrick Run

SAMPLE ID	DATE	Flow	pH	Alk	Acid	Fe	Mn	Al	SO4	TSS
		gpm		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Sherrick Above DM	4/11/06		6.5	122	-96	2.4	0.5	2.0	216	2
Sherrick Run AMD	1/13/06	162	3.8	0	81	1.0	1.8	11.5	715	1
Sherrick Run AMD	4/11/06	201	3.9		66	0.9	1.5	7.8	751	5
Sherrick Run AMD	4/27/07		3.9	0	56	0.3	1.3	6.6	533	3
Sherrick Run AMD	5/22/07		3.9	0	62	1.8	1.9	7.2	569	5
Sherrick 1st Bridge*	4/11/06		6.3	72	48	1.1	0.8	4.2	317	3
Sherrick 1st Bridge*	5/22/07		5.5	9	1	0.4	1.5	3.6	409	4
Sherrick 2nd Bridge*	4/11/06		6.4	72	-50	2.4	0.9	5.0	310	1

** these sampling locations are below the AMD discharge*

Water samples were collected from Sherrick Run upstream and downstream of the AMD inflow. The stream is alkaline above the inflow. The alkalinity loading was sufficient on both sampling days to neutralize the AMD inflow. Aluminum forms a white solid under these conditions that can appear turquoise when water depths are more than 6 inches. The solids are conspicuous (Photos C and D). The white foam is a common result of aluminum solids flowing through turbulent environments.

Photo A. Sherrick Run AMD discharge flowing to the stream.

Photo B. Sherrick Run just below the discharge.

Photo C. Sherrick Run below the AMD inflow.

Photo D. Sherrick Run from second bridge below discharge.

Shupe Run Discharge

Shupe Run discharge is a tributary stream of Jacobs Creek originating northeast of Mt. Pleasant flowing south along the eastern edge of town into Jacobs Creek. The location of the discharge is shown in Figure 1. The Shupe Run discharge is 4,000 feet upstream from the mouth and is located between an abandoned set of railroad tracks that is being converted into a paved walking/biking trail, and a set of railroad tracks that is in use. The discharge flows from an abandoned deep mine from the Pittsburgh coal seam into a basin between the tracks (Photo E). During dry weather the slope entry does not discharge water. When the water elevation in the mine rises high enough, water flows into the basin and discharges to the stream via a 24 inch plastic pipe under the walking/bike trail (Photo F). Shupe Run above the inflow is not degraded by mine drainage (Photo G). When the discharge is flowing, it degrades Shupe Run with iron staining (Photo H).

The slope entry from the Shupe Run discharge is located less than 10 feet from the walking/bike trail. This mine opening poses a threat to people walking/riding the trail since it is located just off the edge of the trail. There are no signs or barriers warning people of this potential hazard.

The mine opening appears to be coming out from under the abandoned rail line 50 feet east of Shupe Run. A local landowner reported that the discharge location was a slope entry into the Standard Mine of the Pittsburgh Coal seam. The surface elevation of this discharge is near 1060 feet in elevation and the Pittsburgh Coal is near 1020 feet in elevation (see Figure 2). The coal is nearly 40 feet below the surface and this portion of the mine is completely flooded. A discharge only occurs when the mine pool rises high enough to reach the culvert pipe to Shupe Run.

The flow into Shupe Run was sampled on both occasions that a discharge existed (April and May 2007). No discharge was observed in 2006. Table 2 shows the sampling results. The AMD has pH 5.5 and contains iron and aluminum. The flow is approximately net neutral. The chemistry is conducive to passive treatment that provides aeration to promote iron oxidation and settling time to precipitate Fe and Al solids. The apparently poor treatment by the basin may reflect short circuiting between the entry and the discharge culvert. It may be advantageous to install a floating curtain that directs the flow away from the final pipe and assures a long retention time. A floating aerator placed in the basin would likely increase Fe removal. The aerator would need to be maintained because of the tendency for iron to foul the machinery

Table 2. Shupe Run Mine Drainage Sampling Data. Flow rates could not be measured.

SAMPLE ID	Date	pH	Alk	Acid	Fe	Mn	Al	SO4	TSS
			mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Shupe Run Above DM	4/27/07	6.8	86	-80	5.2	0.8	1.2	207	8
Shupe Run AMD	5/22/07	5.6	23	4	18.5	1.8	1.6	404	30
Shupe Run AMD	4/27/07	5.5	17	-15	17.6	1.7	4.6	432	7
Shupe Run Mouth	4/27/07	7.5	126	-118	0.5	0.2	0.2	90	5

The discharge basin is located within 200 yards of a wastewater treatment plant. The plant operators may be willing to assist with routine O&M of a passive system constructed in the basin. There is increasing interest in tertiary treatment for phosphate at wastewater plants. Iron oxide has a high adsorption capacity and has been shown to be very effective for phosphate removal. It could be advantageous to divert the wastewater plant discharge through the basin and achieve both Fe and P removal. This innovative concept might be of interest to the Growing Greener Program.

Hydrogeologic Considerations

Both the Shupe Run and Sherrick Run discharges are located in the Uniontown (Latrobe) Syncline. The Sherrick Run discharge has a surface elevation of near 1050 feet MSL. The Pittsburgh Coal seam crops out at about 1050. It appears as though there may have been some surface mining of the Pittsburgh coal along Sherrick Run as evidenced by the spoil showing in the field above the discharge point. As noted above, the coal seam at the Shupe discharge is located about 40 ft below the surface, so there is unlikely to be any historic surface mining in this area.

Figure 2 is the coal structure map for the Pittsburgh Coal seam in the Westmoreland County. The location of the two discharges is noted. The discharges flow from the same mine complex are are likely connected hydrologically. The Shupe Run discharge is nearly 10 feet higher in elevation than the Sherrick Run discharge and acts like an overflow for the mine pool. Under high flow conditions it appears that the Sherrick Run discharge cannot carry the full flow and the pool rises. If the pool rises ten feet, a discharge into and out of the Shupe Run basin occurs. This discharge likely acts as the high-flow relief valve for the minepool. On occasions when the pool is able to fully discharge to Sherrick Run, the Shupe Run discharge does not flow, but the connection with the mine pool still exists, causing the persistence of degraded water conditions in the basin.

If this interpretation is correct, then the installation of a better drain from the deep mine to Sherrick Run would prevent the pool from rising and discharging at Shupe Run. This drain would further degrade Sherrick Run, but would restore Shupe Run.

An alternative solution could be to pump water from the pool at the Shupe Run location and treat it in the Shupe Run watershed. The slope entry accesses the coal, which is at ~1020 feet or about 30 ft lower than the Sherrick Run discharges. The AMD could be treated in the existing basin and in other areas that are adjacent to the bike trail. The Shupe AMD is less severe than the Sherrick Run AMD and is easier to treat passively. A prolonged pumping test would be necessary to determine whether the better chemistry is maintained by reversing the current flow paths through the mine workings. If this approach was pursued, it would be logical to involve the wastewater authority in the plan. BAMR has stated on many occasions that it will construct treatment systems for groups who are able to commit to long-term O&M. If a plan could be developed that would benefit the wastewater plant, it may be feasible for plant personnel to handle long-term O&M responsibilities for a passive treatment system.

Conclusion

It appears that the discharges on Sherrick Run and Shupe Run are related. Both flow from the same deep mine complex in the Pittsburgh coal seam. The Sherrick Run site, at 1050 ft elevation, is the primary discharge from the mine complex, while the Shupe Run discharge, at 1060 ft, appears to be an overflow.

Treatment of the Sherrick Run discharge is difficult because of its location immediately adjacent to the stream. Treatment requires that the discharge be raised to access suitable undeveloped property adjacent to the stream. This requires pumping of the AMD 20- 30 ft in elevation. If this option is pursued, an effort should be considered to better drain the mine and prevent its overflow to the Shupe Run watershed.

An alternative plan is to pump water from the Shupe Run slope entry and eliminate the Sherrick Run discharge. This option may be preferred because the water quality at Shupe Run is better, there is more room for treatment, and the Mt Pleasant wastewater plant is located nearby. If the wastewater plant would agree to maintain a pumped passive AMD system, long-term costs could be substantially decreased. There may be benefits to the wastewater facility provided by the AMD treatment, such as enhanced phosphate removal. This innovative approach could be pursued through a Growing Greener grant.

The Shupe Run entry is located immediately adjacent to a walking and biking trail. This is a hazardous condition that should be corrected with fencing or the installation of a wet seal.

Photo E. Shupe Run discharge flowing into basin between railroad tracks. The discharge is in the foreground (beneath the water surface)

Photo F. Shupe Run AMD Discharge flowing into Shupe Run.

Photo G. Stream above Shupe Run Discharge.

Photo H. Shupe Run discharge staining bottom of Shupe Run.

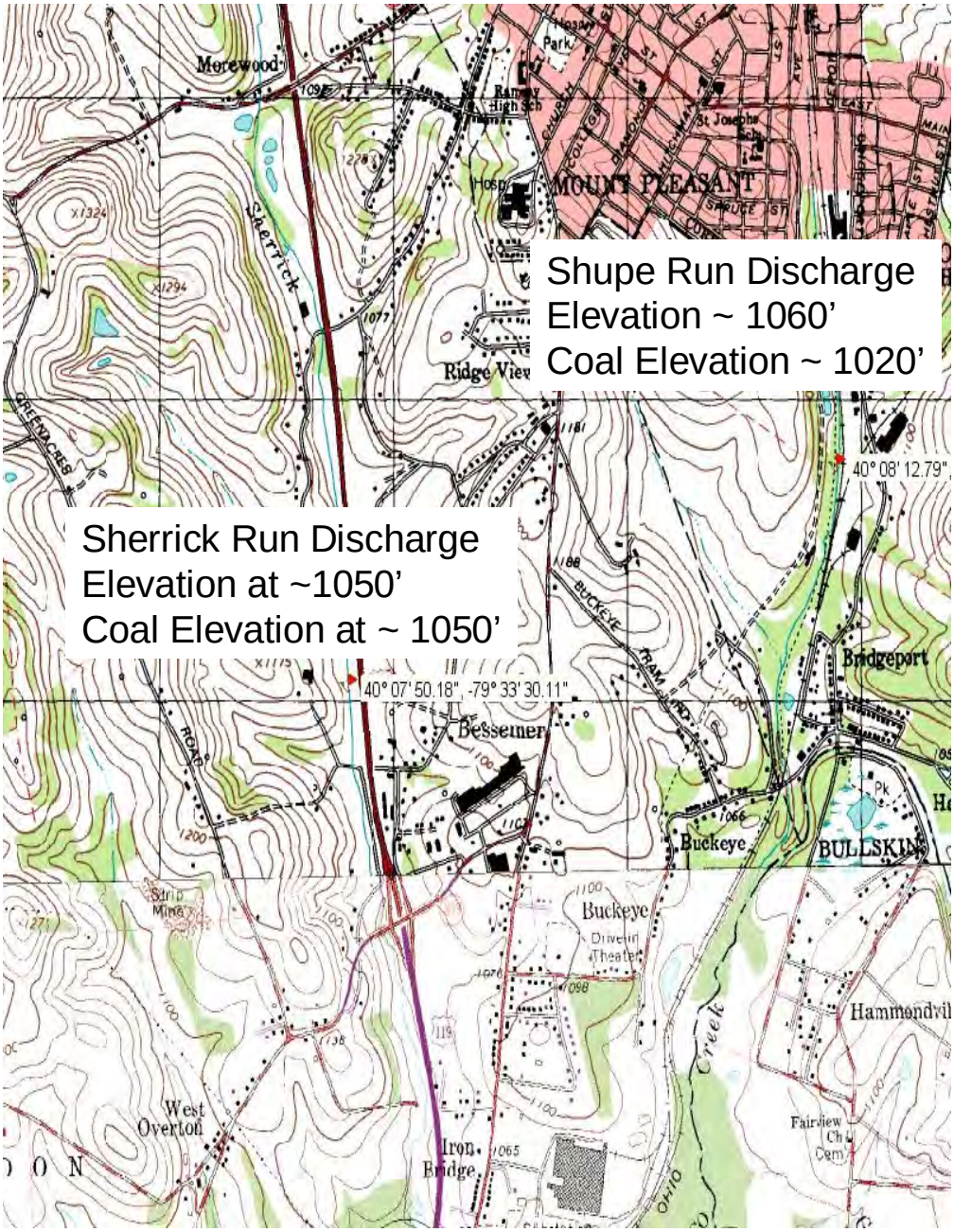


Figure 1. Locations of the AMD discharges in the Mt. Pleasant Area

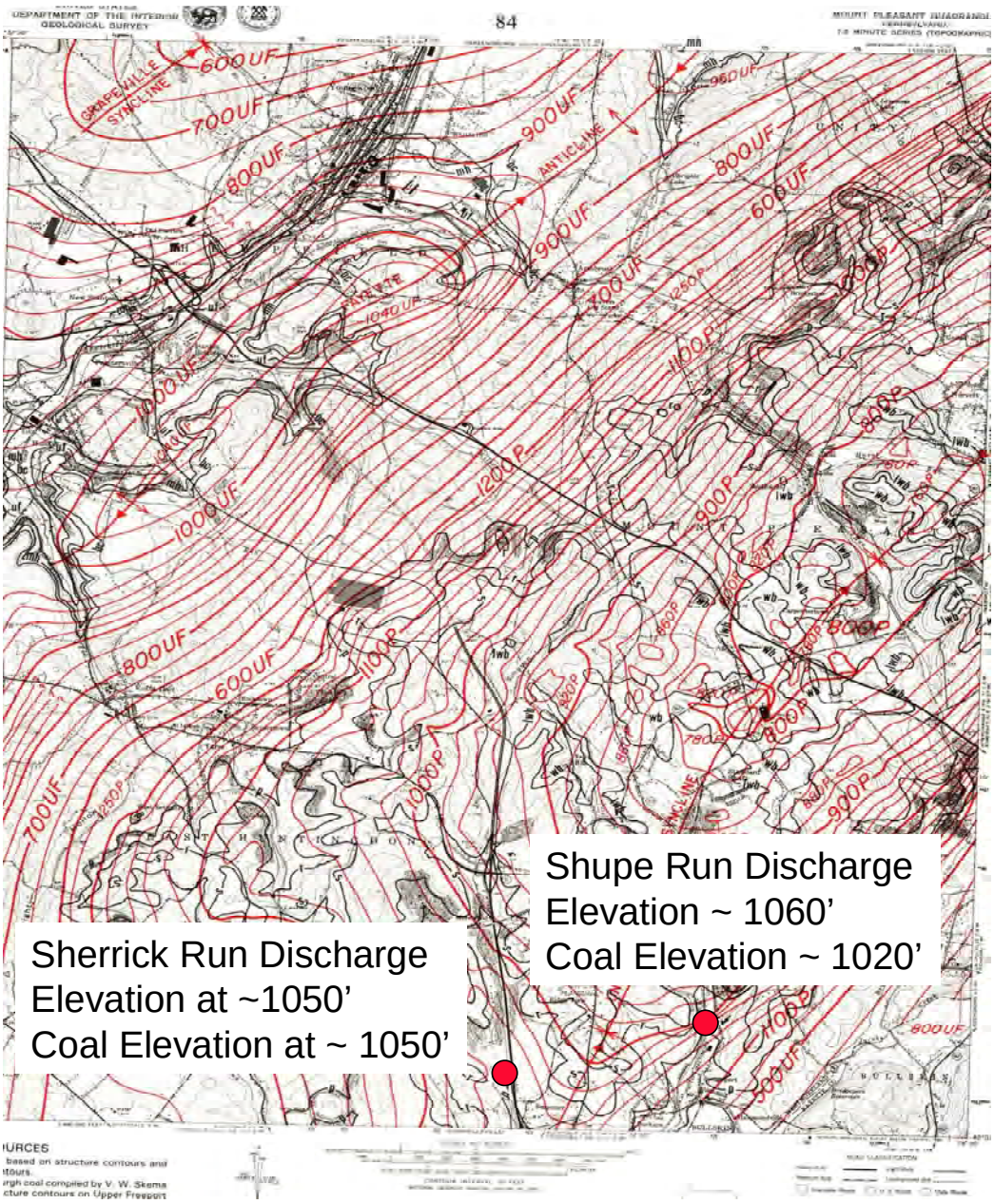


Figure 2. Structure of the Pittsburgh Coal in the Mt Pleasant area and the location of the two discharges

APPENDIX C: PHOTOGRAPHS

Photo 1: Shupe Run - Willow Park bank erosion

Photo 2: Shupe Run -previously stabilized bank project area

Photo 3: Shupe Run – Sediment Deposit

Photo 4: Shupe Run – Spoil Pile

Photo 5: Greenlick Run – Reservoir Discharge

Photo 6: Greenlick Run – Below Reservoir

Photo 7: Jacobs Creek – Good reach below Bridgeport Reservoir

Photo 8: Jacobs Creek – Trees blocking flow

Photo 9: Jacobs Creek - AMD Discharge at Bridgeport

Photo 10: Jacobs Creek – Bank erosion

Photo 11: Sherrick Run – Silt in channel along SR 119

Photo 12: Sherrick Run – Bank erosion

Photo 13: Stauffer Run - Alverton

Photo 14: Stauffer Run - Scottdale flood control project

Photo 15: Anderson Run – Scottdale

Photo 16: Anderson Run - Scottdale