Commonwealth of Pennsylvania

Nonpoint Source MANAGEMENT PLAN

pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

Bureau of Conservation and Restoration

3700-BK-DEP4490

Table of Contents

List of Figures

List of Tables

I. Introduction

A. Program History and Reference to Past Performance

The Federal Water Pollution Control Act of 1948, codified as amended at 33 USC § § 1251-1376, was essentially the first federal law to address water pollution. It was amended in 1972 and became commonly known as the Clean Water Act (CWA). Pennsylvania's Nonpoint Source Management Program was developed in response to amendments in 1987, which included Section 319, 33 USC § 1329, to address problems caused by pollution from non-point sources. Unlike point source pollution, which comes from a clearly defined location, non-point source (NPS) pollution originates from a broad area and is the result of larger scale human activities. Sometimes referred to as "polluted runoff," NPS pollution is generally caused by the interaction between stormwater runoff and certain civil and industrial activities (e.g. urban/suburban growth, agriculture, resource extraction, etc.).

Initially, Section 319 required each state to prepare an Assessment Report and a Management Plan for the state NPS Management Program. In the Assessment Report, the states were required to identify significant sources of NPS pollution. The Management Plan was designed to identify the program components to be used to address the problems identified in the Assessment Report. After the completion of Pennsylvania's Assessment Report and Management Plan in 1990, the state was eligible for funding from the U.S. Environmental Protection Agency (EPA) to implement provisions of the Management Plan.

Section 319 program guidance requires each state to update its NPS management plan every five years. Pennsylvania last updated its NPS Plan in 2008. The 2008 update expanded and enhanced Pennsylvania's 1999 NPS Management Program and included a variety of regulatory, non-regulatory, financial and technical assistance programs needed to improve and maintain surface and groundwater quality.

The Department of Environmental Protection (DEP) has received approximately $104 million from the Section 319 Grant Program (FY1990 through FY2013). This money has been used to support efforts focused on the management and abatement of NPS pollution in Pennsylvania, implement various innovative technologies to treat NPS pollution problems, develop an educational program and begin several comprehensive watershed initiatives.

This plan, the *Nonpoint Source Management Plan 2014 Update* outlines the efforts and activities occurring and planned to occur in Pennsylvania to address NPS pollution through 2020 based on having adequate resources including necessary personnel.

This update enhances Pennsylvania's NPS Management Program approved by EPA in 2008 in compliance with Section 319(b). This plan also establishes the overall strategies implemented by all partners in Pennsylvania to address the impacts of non-point source pollution.

This Management Plan expands and enhances Pennsylvania's 2008 NPS Management Program and includes a variety of education and outreach, technical assistance, financial assistance, monitoring, compliance and enforcement programs as well as some efforts to improve technological abilities as needed to improve and maintain surface and groundwater quality. This Management Plan is organized into several components commensurate with EPA guidance regarding the components of a successful NPS pollution management program. Component 1 is a review of the Goals, Measureable Objectives and Strategies developed by Pennsylvania to address NPS pollution issues. Component 2 is a review of the working NPS partnerships within Pennsylvania. The entities involved with NPS pollution abatement include governments, private organizations, and citizens who are working together to address NPS pollution. Component 3 is a review of the programs and projects designed to address NPS pollution currently in existence and whose continuation is expected over the course of the next five years. Component 4 is a discussion on the methods by which financial resources are devoted to various NPS pollution abatement tasks. Component 5 is a discussion on the methods by which Pennsylvania assesses the quality of the water resource within its borders. Component 6 (found in Appendix C) is a brief review of the program components required by Section 319(b). Component 7 is a reference to other baseline requirements found in other statutory and regulatory programs which dovetail with NPS pollution abatement and activities which may impact NPS pollution. Component 8 is a brief discussion on fiscal management and Component 9 is a brief discussion on programmatic review.

This plan is a continuation of and update to the 2008 update of the NPS Management Plan. For a description of accomplishments with respect to the NPS Program and the goals as stated in the 2008 Update, please refer to the respective NPS Program Annual Reports for those respective years. NPS Program Annual Reports can be found on the DEP website, a link is provided below.

http://www.portal.state.pa.us/portal/server.pt/community/nonpoint_source_management/10615

B. Social and Physical Setting

The Commonwealth of Pennsylvania, also known as the Keystone State given its geographic situation amongst other states, is located in the Mid-Atlantic region of the United States. Pennsylvania is, by population and land-surface area, the largest state in the Mid-Atlantic region. Pennsylvania's surface area covers approximately 46,056 square miles, and over 12.7 million individuals reside within this area. Pennsylvania ranks number three in terms of water surface area, when compared to other Mid-Atlantic states (Virginia and Maryland are one and two respectively); Pennsylvania has more water surface area than Delaware and West Virginia combined.

Mid-Atlantic Rank	State	National Rank	Population
1	Pennsylvania	6	12,702,379
2	Virginia	12	8,001,024
3	Maryland	19	5,773,552
4	West Virginia	37	1,852,994
5	Delaware	45	897,934

Table 1: A list of states in the Mid-Atlantic Region, listed by rank with respect to population.

Mid-Atlantic Rank	State	National Rank	Area (square miles, including water)
1	Pennsylvania	33	46,056 sq. mi
2	Virginia	35	42,774 sq. mi
3	West Virginia	41	24,230 sq. mi
4	Maryland	42	12,407 sq. mi
5	Delaware	49	2,489 sq. mi

Table 2: A list of states in the Mid-Atlantic region, listed by rank with respect to total area in square miles.

Pennsylvania can be divided into six unique physiographic provinces, each province providing unique challenges for the water resource professional. Those six provinces are the: Atlantic Coastal Plain Province, Piedmont Province, Ridge and Valley Province, New England Province, Appalachian Plateaus Province, and the Central Lowland Province. Throughout these provinces, a wide variety of topographic and geologic features will be found. Flat, karst valleys bereft of surface water and containing sinkholes discouraging infiltration may be found near areas of steep slopes and shallow rocky soil. With respect to elevation, the lowest point in Pennsylvania is situated near sea level (PA, NJ, DE boarder in the Delaware River) and rises to an elevation of 3,213feet above mean sea level (AMS) on the summit of Mt. Davis in Somerset County.

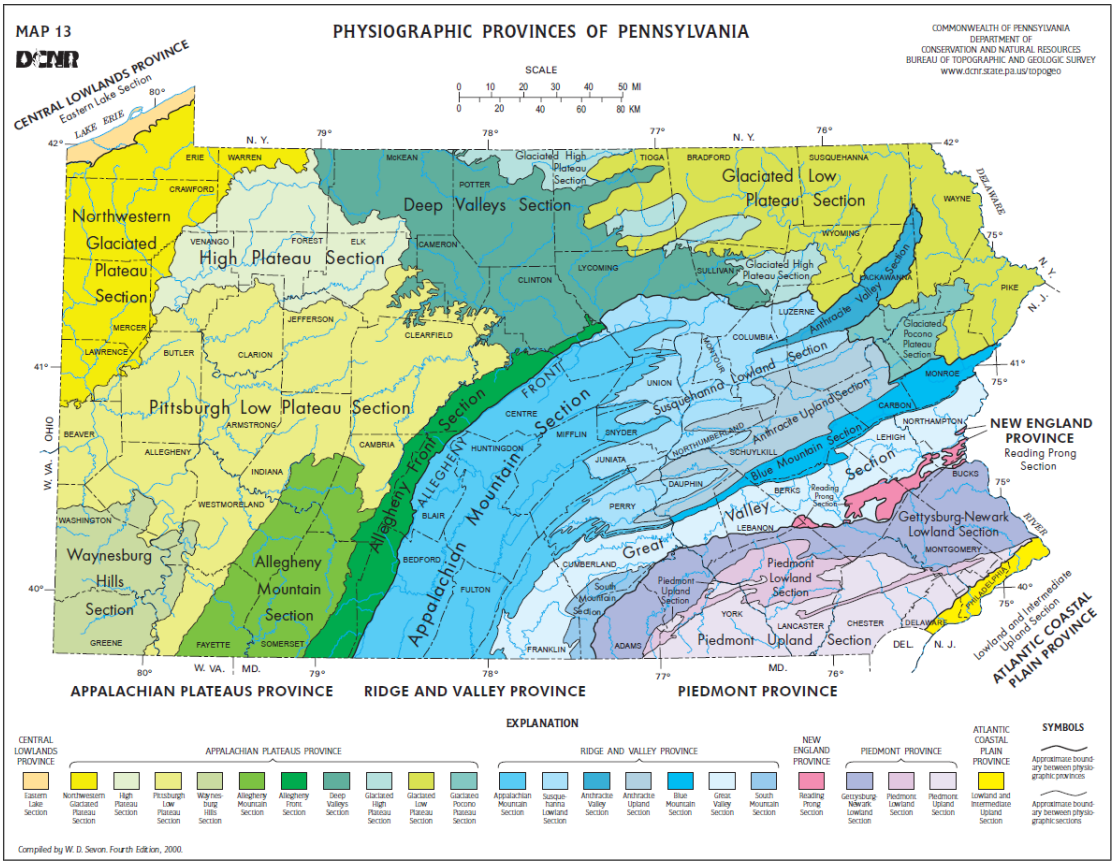

Figure 1: Map 13 provided by the DCNR, listing the 6 major physiographic providences of Pennsylvania and the associated physiographic sections. This map is available online at: http://www.dcnr.state.pa.us/topogeo/field/map13/index.htm

With respect to climate and hydrology, Pennsylvania is a temperate region classified by some as being in the humid continental zone. Average rainfall in Pennsylvania is roughly 43inches per year, but significant variability within the state may be realized. Some cities experience an average of 33inches per year of precipitation while others average an additional 20inches more than that. Average temperatures in Pennsylvania remain in and around 63° Fahrenheit, but can also vary wildly. Low temperatures for the year commonly drop below freezing and high temperatures often crest 90° Fahrenheit. While summer temperatures climb, humidity is also a noticeable factor in climate.

Pennsylvania is home to over 86,000 miles of streams and rivers and an additional 161,455 acres of lakes and reservoirs. Pennsylvania shares a border with one great lake, Lake Erie. Pennsylvania can be divided into six major river basins: the Lake Erie Basin, the Genesee River Basin, Ohio River Basin, Susquehanna River Basin, the Potomac River Basin, and the Delaware River Basin. Two of those river basins, the Susquehanna (Pennsylvania's largest) and the Potomac ultimately discharge into the Chesapeake Bay.

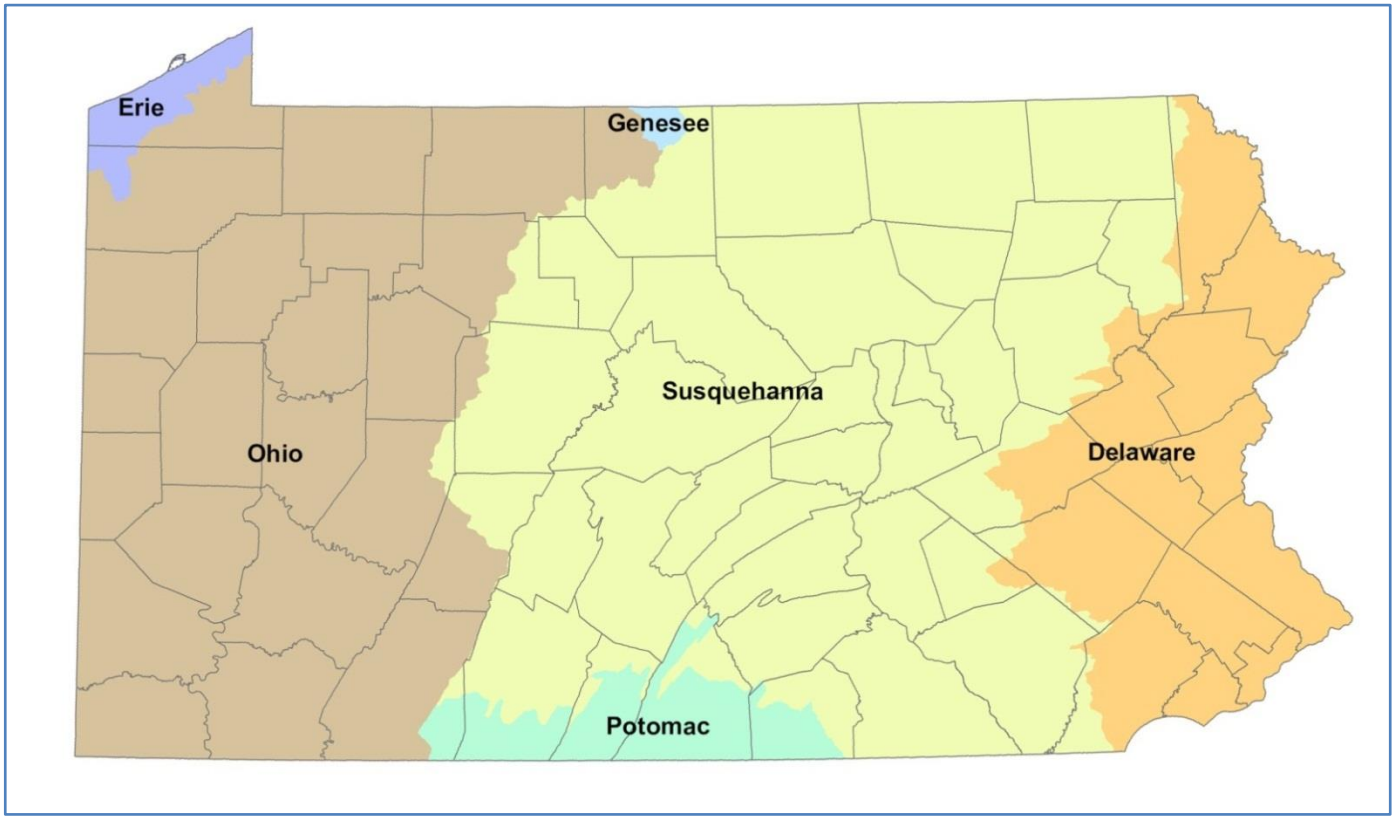

Figure 2: A map, provided by the Bedford County Conservation District, showing the six major river basins of Pennsylvania. County boundaries are also depicted.

Politically, Pennsylvania is significantly more diverse than many other states in the nation. Pennsylvania is home to 67 counties, and each county is further divided into a variety of municipalities including townships, boroughs, and cities. Pennsylvania is home to 2,562 municipalities, each one with its own unique set of zoning ordinances, land use plans, and bodies of government. This political structure is both an asset and challenge; citizens receive more direct governance at the local level while the overlapping jurisdictions governing activities affecting resource management increase the complexity of certain activities.

Understanding this organizational structure is critical for the water resource manager; each municipality is likely to possess and enforce its own unique set of ordinances regarding stormwater management, wellhead protection, and other water and land use issues. For example, in the case of the Stormwater Management Act, (Act 167), 32 P.S. § § 680.1-680.17, counties may adopt a county-wide stormwater management plan but further acceptance on the part of each municipality within that county is required for true on-the-ground implementation of stormwater management ordinances. The ordinances adopted under county-wide Act 167 plans are separate from and in addition to existing state level requirements found in the National Pollution Discharge Elimination System (NPDES) associated with the discharge of stormwater from active construction sites. Water resource professionals and citizens alike must perform an adequate level of due diligence when working in Pennsylvania on projects and activities associated with the water resource.

Given the natural and political diversity found throughout Pennsylvania, itis not surprising that land use in Pennsylvania is also diverse. Pennsylvania is home to several major cities; the largest is Philadelphia, which is the fifth largest city in the United States. Pennsylvania is also home to a significant amount of forest and land-use devoted to agriculture. Suburban areas are also common throughout most of the commonwealth, mostly in the southern portion of the State. Since the drafting of the last NPS Management Plan in 2008, national economic challenges impacted land-use and growth in Pennsylvania. Regardless of those broad spectrum economic issues, the impacts of past development remain.

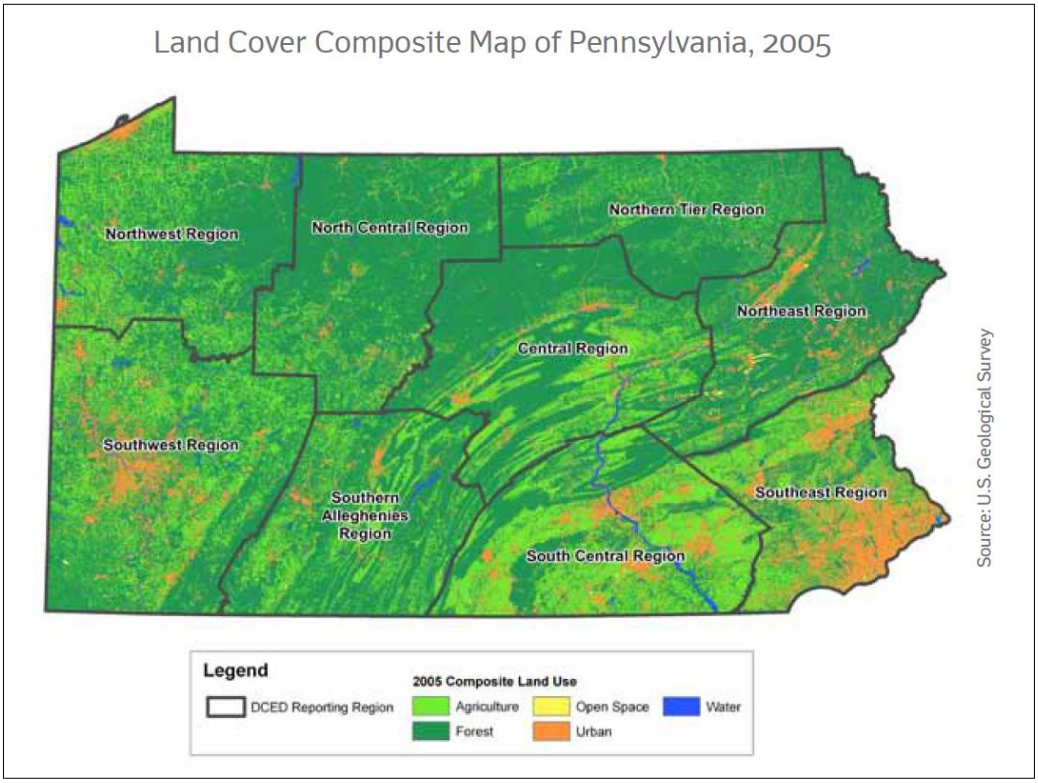

Figure 3: A map, as found in the 2010 Land Use Growth Management Report prepared by DCED depicting land use in Pennsylvania in 2005. The Land Use Growth Management Report is available online here: http://newpa.com/webfm_send/1577

For the water resource professional, especially those engaged in the abatement of non-point source pollution, the above information should clarify the issues and challenges faced in Pennsylvania. Pennsylvania is home to a large and diverse population with a variety of industries, land-use challenges and a significant amount of water to manage. The goals outlined in this Plan and the implementation of the strategies set forth to accomplish those goals will focus the efforts made in Pennsylvania to address NPS pollution. It is important to realize, the true foundation of this pollution management plan is not the goals or milestones outlined below, but rather the watershed restoration partnerships formed at the local level focused on addressing pollution sources and restoring impaired waters.

C. Existing Water Quality

Biannually, DEP distributes a report on the quality of the waters of the Commonwealth. That report is prepared in accordance with requirements of the Clean Water Act sections 303d and 305b. That report is commonly referred to as the Integrated List. The most current edition of the Integrated List was issued in 2014. For the time period for which this Management Plan is expected to cover (2014 – 2019), two additional editions of the Integrated List are expected. DEP uses the results reported in the Integrated List to help gauge the success of those involved with the abatement of NPS pollution. For the most detailed discussion on the health of the water resources located in Pennsylvania, interested individuals should read and review the Integrated List. A less detailed discussion of that report in association with the activities performed and aimed at addressing NPS pollution is found annually in the NPS Program Annual Report. It is not the purpose of this plan to provide an in-depth review of the Integrated List.

Non-point source threats to the waters of the Commonwealth originate from several sectors. Primarily, nutrients and sediments originating from agricultural activities, metals originating from a legacy of energy resource extraction and an excessive volume of stormwater and other pollutants associated with growth and development (e.g. construction of new housing, warehousing, transportation facilities and networks and the like) can all work against the health of water bodies in Pennsylvania if these issues are not properly addressed by those involved in those activities.

D. Overview of Plan

The Plan contained herein will establish five major goals. Those five goals can serve as one basis for evaluating the effectiveness of the NPS program in Pennsylvania over the course of the next five years.

Achievement of these goals will occur as a result of a unified effort using many tools available to those involved with the abatement of NPS pollution. In the most general of terms, the tools available and the efforts expended are focused into two broad categories: *protection* and *restoration*. Examples of protection-oriented efforts include: education and outreach activities, regulatory compliance and enforcement activities, and monitoring and data collection. Restorative activities generally include: technical and financial assistance as well as BMP implementation, operation, and maintenance. In Pennsylvania, certain entities are responsible for only one of these activities, while other entities are engaged in many of these activities. Table 3 below is an abridged list of NPS Program partners engaged in NPS pollution abatement and the capacity in which those partners serve.

Non-Point Source Pollution Management Partners Active in Pennsylvania

	Type	E&O	Technical Assistance	Financial Assistance	Monitoring	Compliance / Enforcement	R&D	BMP IMP
WPCAMR	NGO	X	X					X
EPCAMR	NGO	X	X					X
PA Forest Landowner Assoc.	NGO	X	X					
Watershed Associations	NGO	X						X
PA SECs	NGO	X			X			X
Chesapeake Bay Commission	Gov't Partnership	X	X	X	X	X	X	X
Delaware River Basin Commission	Gov't Partnership	X				X		
Natural Resource Conservation Service	Federal	X	X	X	X		X	X
Environmental Protection Agency	Federal	X	X	X				
US Army Corps of Engineers	Federal	X	X			X		X
National Fish and Wildlife Service	Federal	X	X	X				X
Federal Emergency Management Agency	Federal	X	X	X		X		
US Forest Service	Federal	X	X		X	X	X	X
National Oceanic and Atmospheric Administration	Federal	X	X		X		X	
US Geological Survey	Federal	X	X		X		X	X
US National Park Service	Federal	X						X
Penn State University	Higher Ed	X	X		X		X	X
Conservation Districts	Local Govt	X	X	X	X	X	X	X
Municipal Sewage Enforcement Officers	Local Govt	X	X			X		
Municipalities	Local Govt		X			X		X
PA Department of Agriculture	State	X	X			X		
State Conservation Commission	State	X	X			X		
PennDOT	State		X	X	X	X	X	X
Dept. Of Community and Economic Development	State	X	X	X				
Dept. Of Natural Resources	State	X	X	X	X	X	X	X
Susquehanna River Basin Commission	State	X	X		X	X	X	
PA Fish and Boat Association	State	X	X	X	X	X		X
PENNVEST	State			X				
Pennsylvania Association of Conservation Districts	NGO	X	X	X				
Villanova University	Higher Ed	X	X		X		X	X

	Type (cont.)	E&O (cont.)	Technical Assistance (cont.)	Financial Assistance (cont.)	Monitoring (cont.)	Compliance / Enforcement (cont.)	R&D (cont.)	BMP IMP (cont.)
Farm Service Agency	Federal	X		X				
William Penn Foundation	NGO	X	X	X	X		X	X
PSATS	NGO	X	X					
Penn Ag Industries	NGO	X	X					
Alliance for the Chesapeake Bay	NGO	X	X	X	X		X	X
Chesapeake Bay Foundation	NGO	X	X	X	X		X	X
Clearwater Conservancy of Central PA	NGO	X	X	X	X			X
Conemaugh Valley Conservancy	NGO	X	X	X	X			X
Western PA Conservancy	NGO	X	X	X	X			X
The Nature Conservancy	NGO	X	X	X	X		X	X
Earth Conservancy	NGO	X	X	X	X			X
North Central PA Conservancy	NGO	X	X	X	X		X	X
Brandywine Conservancy	NGO	X	X	X	X		X	X
Stroud Water Research Center	NGO	X	X	X	X		X	X
Pocono Northeast RC&D Council	NGO	X	X	X	X			X
Capitol RC&D Council	NGO	X	X	X	X			X
Environment Erie	NGO	X	X	X	X			X
PA Lake Management Society	NGO	X	X		X		X	
Trout Unlimited	NGO	X	X	X	X		X	X
York County Community Foundation	NGO	X		X				X
American Rivers, Inc.	NGO	X	X	X				X
Partnership for the Delaware Estuary	NGO	X	X	X	X		X	X
Stream Restoration Inc.	NGO	X	X	X	X		X	X
Headwaters Charitable Trust	NGO	X	X	X	X		X	X
Izaak Walton League	NGO	X	X	X	X		X	X
Nature Abounds	NGO	X			X			
Pennsylvania Organization for Watersheds and Rivers	NGO	X						
PA Environmental Council	NGO	X	X	X			X	X
PENN Future	NGO	X						
PA Horticultural Society	NGO	X	X	X				X

Table 3: An abridged list of partners engaged in the work of NPS pollution abatement in Pennsylvania. Note, this is not a complete list; the complete list of partners engaged in this work is too lengthy to include.

Successful achievement of the goals outlined below will only be realized if many entities—many *partners*—successfully collaborate and focus on the achievement of these goals. In Pennsylvania, there exists a robust and experienced network of professionals engaged in water resource management, government, finance, education, planning, restoration, monitoring, and maintenance activities. This network is composed of citizens, non-governmental organizations (NGOs), local government entities, conservation districts, state government entities, and federal government entities. The successful

achievement of the goals outlined in this plan will be realized as those partners draw from the unique abilities inherent within their organizations. Collaboration is paramount to success.

II. Vision Statement

Pennsylvania's Nonpoint Source Pollution Management Plan will help guide the water resource protection and restoration efforts of Pennsylvania's environmental protection partnership. This plan outlines watershed restoration and protection goals for the purpose of guiding and documenting partnership efforts in a way that will most effectively address nonpoint source pollution issues impacting Pennsylvania's water resource.

III. Goals, Objectives, Strategies

A detailed matrix showing the goals, objectives and strategies of this plan can be found in Appendix A attached to this report. Below is a brief list of the goals of this Plan.

A. Goals

1) **Goal 1:**
Improve and protect the waters of the commonwealth from nonpoint source pollution associated with abandoned mine drainage and other energy resource extraction activities.

2) **Goal 2:**
Improve and protect the waters of the commonwealth from nonpoint source pollution associated with agricultural activities.

3) **Goal 3:**
Improve and protect the waters of the commonwealth from nonpoint source pollution associated with stormwater run-off, as well as streambank and shoreline degradation.

4) **Goal 4:**
Verify the efficacy of Pennsylvania's nonpoint source pollution management efforts through enhanced data collection.

5) Goal 5:
Demonstrate Pennsylvania's nonpoint source pollution management efforts through enhanced data dissemination efforts.

B. Objectives and Strategies

Pennsylvania's Non-point Source Pollution Management Plan (Plan) relies on the water quality protection and restoration efforts of DEP and an existing, robust and effective network of agencies, non-profit entities, schools, and citizens. This Plan uses reasonable milestones and interactive resource management techniques to maintain designated uses where the water resource is currently unimpaired and to restore impaired waters where the water resource is damaged by NPS pollution.

This Plan establishes environmental and programmatic indicators of success. The environmental results will be measured by water quality improvements, NPS pollution load reductions and other observed improvements to the biotic community. Programmatic indicators will be measured by work products and productivity calculated through outcomes-tracking. This plan establishes over 40 objectives that can be quantified or measured and progress on reaching the goals established in these objectives will be evaluated each year in the PA DEP NPS Program annual report. The objectives of this plan address NPS pollution across Pennsylvania and are supportive of the goals established in the Pennsylvania Watershed Implementation Plan for the Chesapeake Bay (CB WIP or Bay WIP).

Quantification of certain activities, such as public education, awareness and action, is more vague and challenging; those activities are considered by Pennsylvania to be absolutely critical in the success of this plan.

Goal 1: Improve and protect the waters of the commonwealth from nonpoint source pollution associated with abandoned mine drainage (AMD) and other energy resource extraction activities.

Objectives and Strategies to meet Goal 1:

1.1 Provide for the operation and maintenance of 46 Pennsylvania-operated AMD treatment systems each year for the next five years.

A significant number of AMD treatment facilities exist within the bounds of the commonwealth. While many of these facilities are owned and operated by local government entities, NGO's and private entities the commonwealth of Pennsylvania does own and operate a significant number of such facilities. To accomplish the above stated objective, Pennsylvania will continue to own, operate and maintain these facilities. To that end, funding necessary to perform O&M will continue to be provided using the AMD Set-Aside funds. Further the necessary personnel to operate these facilities will be maintained and training will be provided to these state employees as well as to others involved with the O&M of other, non-state owned AMD treatment facilities.

1.2 Engage in land reclamation projects resulting in the reclamation of 500 acres of abandoned mine lands (AML) each year for the next five years.

Land reclamation is the best way to reduce and even permanently control AMD by preventing the formation of the contaminated water. This can remove the need for passive or active treatment. Bureau of Abandoned Mine

Drainage (BAMR) uses funding from the Title IV of the Surface Mine Control and Reclamation Act of 1977 (SMCRA) to reclaim priority sites. The Bureau of District Mining Operations (BDMO) has programs to encourage active mine operators to re-mine and reclaim where possible. They do this through Government Financed Construction Contracts, Re-mining permits and Bond Forfeiture Reclamation. Growing Greener, Section 319 Nonpoint Source and CFA grants can also be used for reclamation activities.

1.3 Provide funding and other assistance for the installation of four new AMD treatment systems annually for the next 5 years.

Watershed groups, counties, municipalities, county conservation districts and other non-profit conservation minded groups can obtain funding from Growing Greener, Section 319 Nonpoint Source, CFA and PennVest to build new systems on AMD sites. The same entities can apply for SMCRA Bond forfeiture grants for sites that are defined as "ABS Legacy Sites." If a specific project is located in a Qualified Hydrologic Unit then the entity can apply for AMD Set-Aside funds. Also the Bureau of Conservation and Restoration; Watershed Restoration Division, will use some of this funding for construction of treatment systems. Every year EPCAMR and WPCAMR provide a conference for both government and non-profits groups to exchange ideas on the best treatment options.

1.4 Authorize 7 WPCAMR Quick Response projects each year for the next five years.

WPCAMR will continue to apply for Growing Greener funds to operate the Quick Response program. They will continue to partner with other entities that can provide match funds for the projects. The Bureau of Conservation and Restoration, Division of Watershed Restoration will continue to serve as advisor to the Quick Response program.

1.5 Plug 40 oil and gas wells each year for the next five years.

Abandoned wells that do not have a responsible party to take care of them are addressed by the Well Plugging Program administered by the Office of Oil and Gas Management.

1.6 Through load-reduction efforts with the installation of four new AMD treatment systems, an additional 10,000 pounds of iron will be reduced from the non-point source pollutant stream each year.

The reduction of iron from the waters of the commonwealth is a collaborative effort from all entities engaged in the abatement of AMD. DEP in association with the Department of Interior's Office of Surface Mine Reclamation and Watershed groups, county conservation districts, conservation groups and other non-profit and for profit groups will continue to partner to remove iron as a pollutant from the water resource. Financial assistance will come from Growing Greener, Section 319 Nonpoint Source, CFA, Pennvest and SMCRA funding sources. Watershed Implementation Plans, Watershed Restoration

Plans, Qualified Hydrologic Unit Plans, and other plans will be followed so priorities can be addressed.

1.7 Through load-reduction efforts with the installation of four new AMD treatment systems, an additional 3,000 pounds of aluminum will be reduced from the non-point source pollutant stream each year.

The reduction of aluminum from the waters of the commonwealth is a collaborative effort from all entities engaged in the abatement of AMD. DEP in association with the Department of Interior's Office of Surface Mine Reclamation and watershed groups, county conservation districts, conservation groups and other non-profit and for profit groups will continue to partner to remove aluminum as a pollutant from the water resource. Financial assistance will come from Growing Greener, Section 319 Nonpoint Source, CFA, Pennvest and SMCRA funding sources. Watershed Implementation Plans, Watershed Restoration Plans, Qualified Hydrologic Unit Plans, and other plans will be followed so priorities can be addressed.

1.8 Through load-reduction efforts with the installation of four new AMD treatment systems, an additional 10,000 pounds of acidity will be reduced from the non-point source pollutant stream each year.

The reduction of acidity from the waters of the commonwealth is a collaborative effort from all entities engaged in the abatement of AMD. DEP in association with the Department of Interior's Office of Surface Mine Reclamation and Watershed groups, county conservation districts, conservation groups and other non-profit and for profit groups will continue to partner to remove acidity as a pollutant from the water resource. Financial assistance will come from Growing Greener, Section 319 Nonpoint Source, CFA, Pennvest and SMCRA funding sources. Watershed Implementation Plans, Watershed Restoration Plans, Qualified Hydrologic Unit Plans, and other plans will be followed so priorities can be addressed.

1.9 Through load-reduction efforts with the current operational passive treatment systems, 1,000,000 pounds of iron will continue to be reduced from the non-point source pollutant stream each year.

The continued reduction of iron from the waters of the commonwealth is a collaborative effort from all entities engaged in the abatement of AMD. DEP in association with the Department of Interior's Office of Surface Mine Reclamation and watershed groups, county conservation districts, conservation groups and other non-profit and for profit groups will continue to provide Operation, Maintenance and Replacement (OM&R) activities to continue to remove iron as a pollutant from the water resource. Financial assistance for OM&R will come from Growing Greener, Section 319 Nonpoint Source, CFA, Pennvest, and SMCRA funding sources.

1.10 Through load-reduction efforts with the current operational passive treatment systems, 200,000 pounds of aluminum will continue to be reduced from the non-point source pollutant stream each year.

The continued reduction of aluminum from the waters of the commonwealth is a collaborative effort from all entities engaged in the abatement of AMD. DEP in association with the Department of Interior's Office of Surface Mine Reclamation and watershed groups, county conservation districts, conservation groups and other non-profit and for profit groups will continue to provide OM&R activities to continue to remove aluminum as a pollutant from the water resource. Financial assistance for OM&R will come from Growing Greener, Section 319 Nonpoint Source, CFA, Pennvest, and SMCRA funding sources.

1.11 Through load-reduction efforts with the current operational passive treatment systems, 9,000,000 pounds of acidity will continue to be reduced from the non-point source pollutant stream each year.

The continued reduction of acidity from the waters of the commonwealth is a collaborative effort from all entities engaged in the abatement of AMD. DEP in association with the Department of Interior's Office of Surface Mine Reclamation and Watershed groups, county conservation districts, conservation groups and other non-profit and for profit groups will continue to provide OM&R activities to continue to remove acidity as a pollutant from the water resource. Financial assistance for OM&R will come from Growing Greener, Section 319 Nonpoint Source, CFA, Pennvest, and SMCRA funding sources.

1.12 Through load-reduction efforts with state operated active treatment systems, 750,000 pounds of iron will continue to be reduced from the non-point source pollutant stream each year.

DEP's, Bureau of Conservation and Restoration, is responsible for active treatments plants that are providing the continued reduction of iron from the waters of the commonwealth. AMD Set-Aside funds will be used to provide OM&R activities to continue to remove iron as a pollutant from the water resource.

1.13 Through load-reduction efforts with state operated active treatment systems, 150,000 pounds of aluminum will continue to be reduced from the non-point source pollutant stream each year.

DEP's, Bureau of Conservation and Restoration, is responsible for active treatments plants that are providing the continued reduction of aluminum from the waters of the commonwealth. AMD Set-Aside funds will be used to provide O,M&R activities to continue to remove iron as a pollutant from the water resource.

1.14 Through load-reduction efforts with state operated active treatment systems, 6,500,000 pounds of acidity will continue to be reduced from the non-point source pollutant stream each year.

DEP's, Bureau of Conservation and Restoration, is responsible for active treatments plants that are providing the continued reduction of acidity from the waters of the commonwealth. AMD Set-Aside funds will be used to provide OM&R activities to continue to remove acidity as a pollutant from the water resource.

1.15 Through load-reduction efforts with state operated active and passive treatment systems, 8 billion gallons per year (BGY) of water will be treated reducing non-point source pollutant entering waters of the commonwealth each year.

DEP's, Bureau of Conservation and Restoration, is responsible for active treatments plants and 46 passive treatment systems that are treating 8 BGY of AMD affected water. AMD Set-Aside funds will be used to provide OM&R activities to continue to treat the water.

Goal 2: Improve and protect the waters of the commonwealth from nonpoint source pollution associated with agricultural activities.

Objectives and strategies to Meet Goal 2:

2.1 Implement the Regional Agricultural Watershed Assessment Program in 15 ag-impaired watersheds within the next 5 years.

As Pennsylvania continues to develop and implement a strategy of targeted watershed compliance, 15 watersheds throughout the state will be selected for targeted compliance work. This work will involve the performance of compliance inspections on each farm in the targeted watershed with the intent of identifying significant negative environmental impacts and addressing those impacts through voluntary compliance or, if necessary, through enforcement of existing regulations.

2.2 Conduct inspections on 350 CAFO operations in the commonwealth within the next five years.

DEP's existing organizational structure provides for the implementation of the portion of the National Pollution Discharge Elimination System (NPDES) aimed at limiting discharges from point sources identified as CAFOs. In the process of implementing this program, each CAFO operator will be encouraged to continue to perform routine self-inspections and submit reports documenting the findings of those self-inspections.

2.3 Implement BMPs on 50 agricultural operations per year using state directed funds. These BMPs will be for the mitigation of soil loss and/or wise management of nutrients.

A myriad of programs and partners are actively engaged in the performance of resource conservation work on farms in the commonwealth of

Pennsylvania. To accomplish the above stated Objective, DEP, SCC, PACD, CDs, and certain watershed associations will partner to provide technical and financial assistance to farmers to perform work such as barnyard stabilization, streambank stabilization, the installation of manure storage facilities, the installation of other conservation practices (waterways, terraces and the like).

2.4 Support the review of 30 Nutrient Credit trade applications annually.

A Nutrient Credit Trading Program continues in Pennsylvania. This program continues to be an alternative means for members of the agricultural program to obtain funding once they have achieved a base-line of compliance with erosion control and nutrient management regulations on their property.

2.5 Conduct 2,000 agricultural compliance outreach/education visits on farms in the Chesapeake Bay Watershed each year until all farms in the Chesapeake Bay watershed have been visited.

Pennsylvania, through a collaborative effort between the DEP and the CDs will continue to engage 100 farmers per county with the intent of providing education and encouragement for those farm operators to enter into voluntary compliance with existing state and federal regulations regarding erosion control and nutrient management. These 100 visits are separate from other CAFO inspections or inspections conducted for other purposes and will simply serve as an education and outreach effort, not as a compliance and enforcement effort.

2.6 Provide 6 FTEs under the PACD TAG Grant for designing and installing Ag BMPs.

The PACD Engineering Technical Assistance Grant (TAG) program, in conjunction with NRCS technical assistance funding, was started in 2001 and has since been providing engineering technical assistance to members of the conservation community including watershed organizations, county conservation districts, 501(c) 3 non-profit organizations, municipalities, and educational institutions. The purpose of this grant is to provide high level engineering technical assistance to our conservation partners such as conservation districts, RC&Ds, watershed organizations, and other conservation partners to develop or implement a watershed assessment, watershed restoration plan, watershed protection plan, conservation plan or comprehensive nutrient management plan.

2.7 Support a minimum of 35 Chesapeake Bay Program Agricultural Technicians and Four Agricultural Engineers in the Chesapeake Bay watershed each year for the next five years.

Technicians and engineers embedded in Conservation District offices perform a variety of necessary and effective work to limit soil loss and the improper use of nutrients on farms. Pennsylvania, through the continued implementation of the Chesapeake Bay Program will continue to support, over the next five years, these technicians and engineers.

2.8 Provide support for the implementation of five innovative environmental technology projects (focused on agriculture) within the next five years.

Pennsylvania recognizes the significant progress we can make in addressing NPS pollution through the use and encouragement of innovative technologies and practices. To that end, we facilitate discussions and encourage and support where possible the implementation of these types of activities throughout the commonwealth. Funding reductions to state programs in the recent past have slowed down the rate of implementation of these innovative technologies but with the assistance of private funding sources and the federal Conservation Innovation Grants program, several projects a year continue to be implemented to address some of our more difficult issues such as localized and regional nutrient imbalances.

2.9 Support the certification of 600 certified manure haulers within the commonwealth annually.

Created under the Commercial Manure Hauler and Broker Certification Act, (Act 49, 3 P.S. § § 2010.1-2010.12) the Commercial Manure Hauler and Broker Certification Program requires all owners and employees of a commercial manure hauler or broker business that commercially haul, land-apply, or broker manure in Pennsylvania to hold a valid certificate issued by the Pennsylvania Department of Agriculture (PDA) in order to provide their services in Pennsylvania. The intent of this regulatory program is to ensure that manure generated by agricultural operations is transported and applied in an environmentally safe manner. Commercial manure haulers or brokers handling or applying manure on behalf of agricultural operations in Pennsylvania must do so according to state environmental laws and this certification program ensures that these commercial haulers and brokers are fully aware of and can follow the state's nutrient management, erosion control and related environmental and road usage laws.

2.10 Support the certification of 300 certified Nutrient Management Specialists within the commonwealth annually.

Created under the Nutrient Management and Odor Management Act, (Act 38), 3 Pa. C.S.A. § § 501-522, the Nutrient Management Program, administered by the State Conservation Commission (Commission), requires certain agricultural operations to develop a nutrient management plan following nutrient management planning criteria established under Act 38. Act 38 requires that a trained and certified Nutrient Management Specialist develop the nutrient management plan in order to ensure that farm specific nutrient management plans written for farms falling under Act 38 are completed in compliance with state environmental laws. The PDA is mandated under Act 38 to administer the nutrient management certification program. The requirements for the Nutrient Management Certification Program are created by regulation establishing nutrient management specialist categories (commercial, public, and individual); training and examination requirements and planning requirements that demonstrate a person's competency in developing or reviewing nutrient management plans.

2.11 Maintain the implementation of approved Act 38 Nutrient Management Plans on 300,000 acres of farmland regulated as CAOs and CAFOs each year for the next five years.

Pennsylvania's Nutrient Management Law and CAFO program requires high density and larger animal operations in the state to develop and implement an approved nutrient management plan. This required planning integrates the selected manure, fertilizer, and green manure crop management options into a nutrient management plan that has a one to three year lifespan. The plan developed according to state regulations involves inventorying farm conditions and operations, and allocating nutrient sources to the fields based on farmer specifications, field conditions, operational feasibilities and regulatory criteria. Required plan implementation represents the day-to-day activities carried out by the farmer to execute the decisions made in the plan. Conservation districts and DEP assess the farmers' actions to implement the plan and direct the farmer to make necessary changes in order to meet state required nutrient management laws. The number of acres covered under these approved plans does not change significantly from year to year as the acres farmed by CAOs and CAFOs in the state have stayed relatively stable over time.

2.12 Establish a baseline number of non-CAO/non-CAFO farmed-acres under an NMP or MMP by the end of FFY 2015 and increase the number of farm acres by 5% annually.

In association with the Program's goal of establishing a framework to track NMPs and MMPs developed for farms not regulated as CAOs or CAFOs, Pennsylvania, through the DEP, will track and establish a baseline number of acres covered under an NMP or MMP that are not already accounted for in the state's CAO and CAFO tracking efforts. Once this baseline number is established, the DEP will support outreach and compliance related activities expected to result in a 5% annual increase in the number of non-CAO/non-CAFO farm acres under an NMP or MMP.

2.13 Continue to encourage the use of the PA One Stop program such that the number of fields entered into that system increase by 10% each year over the next five years.

PA One Stop is a progressive effort occurring in Pennsylvania and represents a collaboration between SCC, PDA, DEP and Penn State University. This project provides conservation and nutrient management planning opportunities to farm operators through the World Wide Web. Farmers, and other interested individuals can log onto PA One Stop and enter the necessary information to create their own Ag E&S Plan or Manure Management Plan. Pennsylvania intends to see the use of this on-line tool increase incrementally by 10% each year for the next five years. This objective will be accomplished through continued education and outreach efforts performed by many partners (including PSU, DEP, SCC, CDs, and NRCS).

Goal 3: Improve and protect the waters of the commonwealth from nonpoint source pollution associated with stormwater run-off, as well as streambank and shoreline degradation.

Objectives and strategies to accomplish Goal 3:

3.1 Conduct 11,000 site inspections under the Chapter 102 and Chapter 105 programs annually for the next five years.

Pennsylvania, through the implementation of the Chapter 102 and Chapter 105 programs, will conduct 11,000 inspections on earth disturbance sites each year for the next five years. These inspections may be carried out by employees of delegated County Conservation Districts. These inspections may be routine partial inspections, follow-up inspections, response to complaints received by DEP or delegated conservation districts and performed to ensure that activities regulated by Chapter 102 and Chapter 105 are being conducted in accordance with those regulations and in a manner that minimizes NPS pollution impacts to the waters of the commonwealth.

3.2 Continue to implement the MS4 program through oversight and verification that MS4 communities abide by their permit requirements.

Municipal Separate Storm Sewer Systems (MS4s) are stormwater conveyance systems comprised of roads, ditches, pipes, and other means of conveyance which have been designed or otherwise do engage in the transport and discharge of stormwater. Municipalities which own MS4s may be required to obtain a permit or permit waiver. The Bureau of Point and Non-point Source Management in DEP is responsible for the oversight of this program. As such, annual review of reports submitted by MS4s is conducted. Further inspections are conducted by DEPs regional offices to determine whether or not a municipality categorized as an MS4 is meeting its permit requirements. The link below will provide additional information on this program.

http://www.portal.state.pa.us/portal/server.pt/community/municipal_stormwater/21380

3.3 Continue to administer the Act 167 program directing counties to obtain and implement county wide stormwater management plans.

Act 167 requires counties to prepare and adopt a watershed based stormwater management plan for each watershed within its boundaries. The responsibility for implementing this program is placed on the Bureau of Point and Non-Point Source Management, who then coordinates with DEP regional offices for enforcement of this legislation. Over the past five years significant progress was made at achieving compliance with this legislation in the Northwest Regional Office (NWRO). Further, a web-based flowchart tool (www.paiwrp.com) was developed by the York County Planning Commission which may be used by counties engaged in the process of Act 167 planning. DEP will, over the course of the next five years, continue to

work with county governments to achieve additional compliance. The link below will provide additional information on this program.

http://www.portal.state.pa.us/portal/server.pt/community/act_167/21378

3.4 Implement 40 new, state-funded stream restoration and/or stormwater management projects annually for the next five years.

Stream restoration projects are implemented by a number of partners. Commonly, projects are the result of a collaborative effort between private citizens, NGOs such as local watershed associations, state government entities, federal entities, and educational institutions. Pennsylvania will strive to implement 40 new stream-restoration projects per year for the next five years through the dissemination of funds and partnering. Pennsylvania will encourage these projects through E&O efforts, permitting, collaboration with CDs, implementation of WIPs, and other such efforts.

3.5 Address 500 new DGLV Road sites each year for the next five years.

Through the continued implementation of the Dirt, Gravel, and Low Volume Roads program, which includes partnering with local government entities, County Conservation Districts, and DEP Pennsylvania will continue to address NPS pollution originating from dirt, gravel, and low volume roads. This program includes a significant education and outreach program (e.g. ESM Training), technological developments (e.g. use of DSA and other such materials) as well as on-the-ground implementation of certain maintenance-focused BMPs.

3.6 Support, using state managed funds, the completion of 15 miles of stream restoration and/or bank stabilization projects over the next five years.

Pennsylvania will leverage through the partnering-web a significant amount of funds for the purpose of streambank stabilization and stream restoration projects. Many partners are involved with stream improvement projects. Such partners include: Fish and Boat Commission, DCNR, numerous Watershed Associations, NGOs, the DEP, County Conservation Districts, CFA, local government entities, and others. State and federal grant programs are frequently the source of funding for stream restoration projects. Grant funds are multiplied through match-contributions. Streambank stabilization and stream restoration projects leverage financial assistance and technical assistance while providing pollutant load reductions, local community improvements, educational opportunities, and outreach efforts.

3.7 Statewide, enroll 50,000 acres of new land in the CREP program over next five years.

The Conservation Reserve Enhancement Program (CREP) is a program requiring the involvement of local, state and federal partners. This program involves the leveraging of Federal funds and the coordination between NRCS, County Conservation Districts, DEP and a willingness on the part of

private land owners. Through the continued and potentially increased implementation of this program, Pennsylvania will protect and restore water quality through the construction of riparian buffers.

3.8 Plant and protect 5,000 acres of riparian forest buffer over the next five years.

Through the implementation of the CREP program and similar support programs, Pennsylvania will strive to construct 1,000 acres of new riparian forest buffer each year for the next five years. Further, through the implementation of these programs, many existing and unaccounted forested riparian acres will be preserved.

3.9 Through a forest land-owner stewardship program, develop 30 new plans annually addressing approximately 5,000 new acres of privately owned forest land each year for the next five years.

Pennsylvania, through the efforts of the DCNR will continue to implement a forest stewardship program aimed at conservation-minded forest resource management. This program will work with private landowners and encourage those land owners to obtain and implement forest stewardship plans.

3.10 Plant 10,000 new trees under the TreeVitalize program each year for the next five years.

TreeVitalize continues to be an active and vital program in Pennsylvania's plan to address non-point source pollution. Through the efforts of those involved with this program thousands of trees will be planted near streams and creeks providing shade and mitigation of thermal pollution while decreasing stormwater volume and the destabilization of stream banks.

3.11 Encourage NPS pollution control activities within US Forest Service selected priority watersheds identified under the USFS Watershed Condition Framework within the borders of the Allegheny National Forest (ANF) to the extent that these priority "Functioning at Risk" watersheds within the ANF may be re-categorized as "Functioning Properly."

The USFS Watershed Condition Framework identified two "Functioning at Risk" watersheds within the ANF as priority watersheds for restoration. Those watersheds are the Sugar Run (predominantly McKean County) and Bear Creek (predominantly Elk County). The NPS issues of concern include habitat fragmentation due to passage barriers (culvert crossings), lack of sufficient large wood in streams, non-native plants, water quality including acidic pH levels, and sedimentation from stream crossings and potentially other sources.

Goal 4: Verify the efficacy of Pennsylvania's nonpoint source pollution management efforts through enhanced data collection.

Objectives and strategies to Accomplish Goal 4:

4.1 Establish a process to collect BMP data at the state, watershed and sub-watershed level.

Pennsylvania's Nonpoint Source Program has struggled in collecting comprehensive data identifying the nonpoint source related BMPs that are being implemented across the commonwealth. This problem is especially true as we look to collect data at the sub-watershed level where the water quality results of stream and lake restoration work can be realized in a shorter timeframe. This effort will include working with our local, state and federal partners to develop processes and mechanisms that can be used to collect and report this data to better demonstrate the progress Pennsylvania is making in addressing nonpoint source stream and lake impairments.

4.2 Further develop and maintain PA One Stop to allow the NPS Program to collect the number of acres planned through the use of this tool and to spatially summarize data by watershed.

The PA One Stop planning tool is proving to be a valuable resource to help the agricultural community recognize resource concerns on farms and BMPs that could be used to address those concerns. This tool will be relied upon by individuals in the agricultural community to help meet regulatory compliance with Pennsylvania's Erosion and Sedimentation Control regulations and Manure Management regulations. Tracking the progress of the implementation of the use of this planning tool will support the commonwealth's efforts to demonstrate industry compliance with these environmental regulations.

4.3 Continue to develop and improve our Reclaimed Abandoned Mine Land Inventory System (RAMLIS) GIS Tool.

Every year a new version of RAMLIS will be developed and released by EPCAMR. All GIS data is refreshed annually and the most recent version of GIS is used. Also the Abandoned Mine Land Inventory Sites (AMLIS) will be updated by Pennsylvania DEP Bureau of Mining and Reclamation to be used in the updated version.

4.4 Ensure that the Datashed GIS web tool adequately describes available information relating to the approximate 300 AMD Treatment Systems sites that are treating mine discharges across Pennsylvania and ensure that access to this information is available to the public.

DEP will continue to work with the site's administrator, which at this time is Stream Restoration Inc., to ensure the site is continually functional. DEP will continue to share sampling results with the public and will encourage watershed groups to input data. Through a recent policy revision, it is now a requirement for all groups that construct passive treatment systems using

Growing Greener funds to submit an AMD Treatment System Form that will be sent to the Datashed administrator for input into the system.

4.5 Through the implementation and maintenance of the Water Quality Monitoring Network (WQN), water quality field observations and data collection will occur on 173 monitoring sites each year over the next five years.

Tasked with assessing the water quality of Pennsylvania's 86,000 stream miles every other year, DEP will maintain the Water Quality Network (WQN). The WQN is a network of monitoring sites focused on biology, pathogens, chemistry or physical habitat characteristics. The WQN is composed of approximately 173 sites. To further bolster the monitoring and data collection efforts of Pennsylvania, DEP contracts with the SRBC and the USGS to collect water chemistry data as part of the Water Quality Network monitoring. In total, over 1,100 sites are monitored annually.

4.6 In addition to other monitoring efforts, the DEP will monitor 20 lakes each year for the next five years.

Monitoring is an activity that is performed by many NPS Program partners in Pennsylvania such as the Senior Environmental Corps, schools, conservation districts, private businesses, and state and federally funded grantees. Further, state agencies other than DEP also perform monitoring. Given the variety of entities involved with monitoring, the variety of monitoring schedules and differences in purpose and techniques it is more reasonable for the DEP to track monitoring performed by DEP only while still acknowledging and, when appropriate engaging in bi-lateral sharing of data produced from the other entities carrying out monitoring efforts. DEP monitoring sites are selected to best assess water resources across the commonwealth recognizing our limited staffing and funding available for this activity. The data obtained helps direct resource protection and restoration efforts and is used to support the development of the bi-annual Pennsylvania Integrated Water Quality and Monitoring Report.

4.7 Through monitoring and assessment efforts conducted by the DEP, 60 miles of streams previously impacted by NPS related causes shall be documented as newly delisted from Category 5 and/or Category 4a in the bi-annual Pennsylvania Integrated Water Quality and Monitoring Report.

Pennsylvania's NPS program partners throughout the commonwealth implement restoration initiatives throughout Pennsylvania in order to improve water quality and restore our impaired stream reaches. DEP is informed by staff at the county conservation districts and many of our other NPS Program partners when they have observed conditions or performed preliminary testing that leads them to believe that the particular stream reach is no longer impaired or is significantly improved. At that time, and as resources permit, DEP dispatches biologists out to those sites to determine the impairment or attainment status of the stream reach and provide any updated stream quality information for inclusion in the next publication of the Pennsylvania Integrated Water Quality and Monitoring Report.

4.8 Through monitoring and assessment efforts conducted by the DEP, 1,500 lake acres previously impacted by NPS related causes shall be documented as newly delisted from Category 5 or Category 4a over the next five years.

Pennsylvania's NPS program partners throughout the commonwealth implement restoration initiatives in order to improve water quality and restore our impaired lakes. DEP is informed by staff at the county conservation districts and many of our other NPS Program partners when they have observed conditions or performed preliminary testing that leads them to believe that the particular lake is no longer impaired or is significantly improved. At that time, and as resources permit, DEP will dispatch biologists out to those sites to determine the impairment or attainment status of the lake and provide any updated lake quality information for inclusion in the next publication of the Pennsylvania Integrated Water Quality and Monitoring Report.

4.9 Implement grant funded projects designed to determine BMP effectiveness on at least three priority watersheds.

Pennsylvania has committed support, using EPA provided NPS program funds, to a new effort to monitor stream segments expected to be impacted by BMPs implemented under the USDA National Water Quality Initiative (NWQI). This effort allows the commonwealth to measure the effectiveness of practices installed in these watershed areas. In addition, DEP is carrying out other monitoring efforts on additional areas expected to be improved by the implementation of water quality related BMPs, such as riparian buffers, in order to document the improvements associated with the implementation of these practices.

4.10 Within the next five years, establish a process to input all monitoring data collected by the PA DEP NPS Program into STORET.

STORET is short for STOrage and RETrieval Data Warehouse. STORET is an on-line database maintained by the EPA for the purpose of storing and sharing water quality, biological, and physical data. STORET can be used by state environmental agencies, federal agencies, universities and private citizens. Pennsylvania's NPS program collects data relating to water quality on important and priority streams and lakes throughout the commonwealth. State program staff will enter that information into STORET in order to provide reasonable access to that information.

4.11 Through state-wide NPS pollutant load-reduction efforts, 850,000 pounds of nitrogen will be reduced from the non-point source pollutant stream each year.

The NPS program initiated an effort in 2013 to collect statewide aggregated BMP data annually from over 15 state and federal programs supporting the implementation of BMPs throughout the commonwealth. Through the assistance of Penn State a process was developed to calculation expected

nutrient savings that can be attributed to the implemented BMPs reported to us annually. This process is expected to show that Pennsylvania is newly removing an additional 1,000,000lbs of nitrogen a year from streams and lakes within the commonwealth. Recognizing the inability of the program staff to collect all BMP activities implemented throughout the commonwealth, these estimates are recognized as under reporting the annualized loading reductions occurring in Pennsylvania.

4.12 Through state-wide load-reduction efforts, 50,000 pounds of phosphorus will be reduced from the non-point source pollutant stream each year.

The NPS program initiated an effort in 2013 to collect statewide aggregated BMP data annually from over 15 state and federal programs supporting the implementation of BMPs throughout the commonwealth. Through the assistance of Penn State a process was developed to calculate expected nutrient savings that can be attributed to the implemented BMPs reported to us annually. This process is expected to show that Pennsylvania is newly removing an additional 50,000 pounds of phosphorus a year from streams and lakes within the commonwealth. Recognizing the inability of the program staff to collect all BMP activities implemented throughout the commonwealth, these estimates are recognized as under reporting the annualized loading reductions occurring in Pennsylvania.

4.13 Through statewide load-reduction efforts, 15,000 tons of sediment will be reduced from the non-point source pollutant stream each year.

The NPS program initiated an effort in 2013 to collect statewide aggregated BMP data annually from over 15 state and federal programs supporting the implementation of BMPs throughout the commonwealth. Through the assistance of Penn State a process was developed to calculate expected sediment load reductions that can be attributed to the implemented BMPs reported to us annually. This process is expected to show that Pennsylvania is newly removing an additional 15,000 tons of sediment a year from streams and lakes within the commonwealth. Recognizing the inability of the program staff to collect all BMP activities implemented throughout the commonwealth, these estimates are recognized as under-reporting the annualized loading reductions occurring in Pennsylvania.

4.14 Prevent waterbodies currently not listed as impaired for the aquatic life use designation from being listed as impaired for that designated use through implementation of existing regulatory programs.

Pennsylvania has rigorous and comprehensive regulatory programs addressing activities known to produce nonpoint source pollution. These programs address activities such as resource extraction, earth moving, post construction stormwater, agricultural activities and construction activities adjacent to, or within streams. These regulations are enhanced on our identified special protection waters. These regulatory programs are continually being refined to better address the changing nature of the

industries associated with these activities. The DEP has implemented initiatives including the Targeted Watershed Initiative to ensure that regulated communities are aware of their statutory obligations and are following through as required.

4.15 Establish a data collection framework by which information regarding the obtainment of nutrient and manure management plans (NMPs/MMPs) on non-CAO/non-CAFO farms is collected and counted in terms of acres covered or farms planned.

Currently, Pennsylvania requires all livestock farms and farms using manure as a nutrient source, to obtain either an NMP or MMP depending on certain specific factors of the agricultural operation. This includes farms that do not fall into the category or a CAO or CAFO. At the time of the development of this management plan, there is no process available to collect data on the number of farms or acres of these non-CAO/non-CAFO farms covered under these plans. Pennsylvania, through the efforts of DEP, will strive to create a system by which the acres covered by these non-CAO/non-CAFO nutrient or manure management plans (and other similar plans) will be tracked.

4.16 DEP will develop a process to collect and report on the amount of biosolids land applied following the water quality criteria established under DEP's Municipal Waste regulations.

Pennsylvania, through the efforts of the Bureau of Point and Non-point Source Management will continue to implement a regulatory program (including permitting and inspections) which will regulate the safe land-application of bio-solids. Where applicable, DEP attempts to maximize the beneficial use of sewage sludge by land application pursuant to DEP's Bureau of Waste Management Municipal Waste regulations. There currently is no consistent process to collect and report on the amount of biosolids applied statewide to the land under the state's general permitting requirements. Efforts will be taken by DEP to establish a consistent process to collect and report on this information.

Goal 5: Demonstrate Pennsylvania's nonpoint source pollution management efforts through enhanced data dissemination efforts.

Objectives and strategies to accomplish Goal 5:

5.1 Annually provide a clear and concise report to the EPA, the general public, regulators, partners and others interested in Pennsylvania's NPS pollution abatement efforts outlining the major accomplishments of Pennsylvania's NPS Program consistent with EPA reporting guidelines.

By July 1 of each year, DEP will, with the assistance of many NPS program partners, prepare an annual report describing the reported major accomplishments of the NPS Program in Pennsylvania. This report will include a brief description of restored and improved waters and will provide a brief summary of information contained in the most recent Integrated List.

It is understood that the NPS Program annual report will not be comprehensive. The amount of BMPs constructed and other projects implemented in Pennsylvania is too great. Further, to truly account for every NPS related activity that occurs in one fiscal year a greater level of partnering between DEP and other program partners will need to be developed (see goal 4.1). Regardless, this annual report will include all load reductions accounted for as well as certain notable efforts to address and mitigate NPS pollutants.

5.2 Develop 2 "Success Stories" per year.

Pennsylvania DEP, watershed associations, county conservation districts, and other partners, will focus on describing in detail to EPA guidance specification, activities that took place in at least two watersheds each year that have achieved "restored" or "significantly improved" status as a result of NPS pollutant load reduction and resource protection and restoration efforts. These "Success Stories" will be reported on annually in the Annual Report and separately to EPA consistent with EPA guidance relating to reporting success stories.

5.3 Provide detailed BMP implementation reporting on ten approved WIPs per year.

Each year, as part of the Annual Report, the DEP will provide a detailed report on the progress of achieving implementation of at least ten of the 35 WIPs currently approved by EPA in Pennsylvania.

5.4 Implement the identified BMPs expected to restore four sub-watersheds included within §319 approved WIPs by the end of the 2019 Federal Fiscal Year. (Achievement of this goal may be measured against full implementation of the BMPs listed in the select sub-watersheds included in §319 approved WIPs).

Throughout the next five years DEP will continue to collaborate with partnering entities focused on the implementation of BMPs included in §319 WIPs. DEP will prioritize these four select sub-watersheds and track progress with respect to the completion of the BMPs included in the WIPs developed for these areas with the intent of implementing the identified BMPs by the end of FFY 2019.

5.5 Fully implement the BMPs expected to restore three select watersheds supported under Pennsylvania's Growing Greener Program's Renaissance Initiative by the end of the 2019 Federal Fiscal Year.

DEP will continue to implement the Renaissance Initiative *under the commonwealth's Growing Greener grant program. This initiative provides a commitment by the commonwealth to support the full implementation of BMPs necessary to restore identified watersheds within a relatively short timeframe. Through this program, over the next five years, the DEP will support the implementation of the BMPs that have been determined necessary to restore three watersheds.*

5.6 Document farmer compliance with agricultural erosion and sedimentation control and manure management regulations in 15 watersheds by the end of the 2019 Federal Fiscal Year.

As DEP continues to collaborate with the agricultural community and the various partners engaged in resource conservation on agricultural operations, DEP will verify or otherwise ensure that every farm in 15 select priority watersheds throughout the commonwealth are operating in compliance with the commonwealth's erosion and sedimentation control and nutrient management regulations, as these regulations pertain to agricultural operations.

5.7 Report semi-annually on progress on implementing the active Section 319 grant work plans ensuring status reports are current for at least 90% of the active grant projects in the GRTS database.

Pennsylvania will continue to report semi-annually (due dates January 31st and July 31st) on the progress the commonwealth is making in implementing the active projects within the approved §319 grant work plans. The program staff at DEP will continue to input the required project reports into the GRTS database system to allow for easy access and monitoring of the program activities by our EPA Section 319 Program Project Officer and other interested parties.

5.8 Complete Watershed Plan Tracker (WPT) data entry for all active WIPs by the end of 2017. The DEP will continue to input current information in the WPT throughout the five year life of this Plan to ensure accuracy of data.

Pennsylvania continues to be a leader in working with EPA Region 3 staff to fully populate the Watershed Plan Tracker tool developed by EPA. DEP program staff have worked with EPA Region 3 staff and a contracted agent to support the full implementation of this tool intended to track progress in meeting the goals of the EPA approved Watershed Implementation Plans and TMDLs. DEP will continue to dedicate staff to support this effort and participate in regional and national meetings associated with this effort.

C. Measurable Objectives to Address Goals

The primary reporting and tracking methodology used for recording activities in Pennsylvania for tracking accomplishments under the Section 319 NPS Program is the Grants Reporting and Tracking System (GRTS) maintained by the Environmental Protection Agency (EPA) and the states participating in the NPS Program. Participating states enter information on each of the projects carried out under the NPS Program. This information includes units of BMPs installed, dates of installation of the various practices, locational data for the practices, progress reports for each of the projects and estimated load reductions associated with the implemented BMPs. The GRTS database includes a reports component that allows states to report on several aspects of NPS pollution abatement associated with NPS Program

projects, including environmental results, project and grant data, NPS pollutant load reductions, and utilization of Section 319 NPS program funds. Sediment, nitrogen and phosphorus are the three required water quality impairment parameters for which load reduction estimates are reported in GRTS. Pennsylvania also reports on load reduction estimates for acidity, iron, aluminum, and manganese associated with the AMD projects implemented under the §319 NPS Program.

In accordance with EPA Region 3 guidance for the Section 319 program, Pennsylvania reports current progress in reducing sediment, nutrient, acidity, and metals loads to surface waters where NPS Program implementation projects are being funded. The GRTS database and associated pollutant load reduction models (i.e. Spreadsheet Tool for Estimating Pollutant Loads (STEPL) and Mapshed) are used as tools to measure the success of NPS Program related pollution management efforts in Pennsylvania.

Data is entered and maintained in GRTS by the DEP's Bureau of Conservation and Restoration (BCR). Data produced by GRTS as well as the associated EPA Watershed Plan Tracker tool (WPT) are reported annually in the Section 319 annual report. Where GRTS, WPT and other load reduction tracking tools do not apply to the goals, objectives, and milestones contained herein, other methods will be used to track progress and determine success. Generally speaking, the milestones set and the methods used to collect the data necessary to determine success have been in place for many years and the results are routinely reported in the Section 319 Annual Report.

IV. Working Partnerships

The vast network of partnerships established since the inception of Pennsylvania's NPS management program could be depicted and described in numerous ways. This network could be likened unto a food-web (e.g. the partnering-web), showing the various functional areas of each partner and the ways in which they connect or relate. Figure 4 is one of many ways in which these linkages can be depicted graphically. It should be realized that this figure was deliberately drafted to show broad and basic connections and does not fully explore every partner or every function. It does provide a starting point from which those engaged in water resource protection in Pennsylvania could conceptualize the partnership network as it exists in this commonwealth.

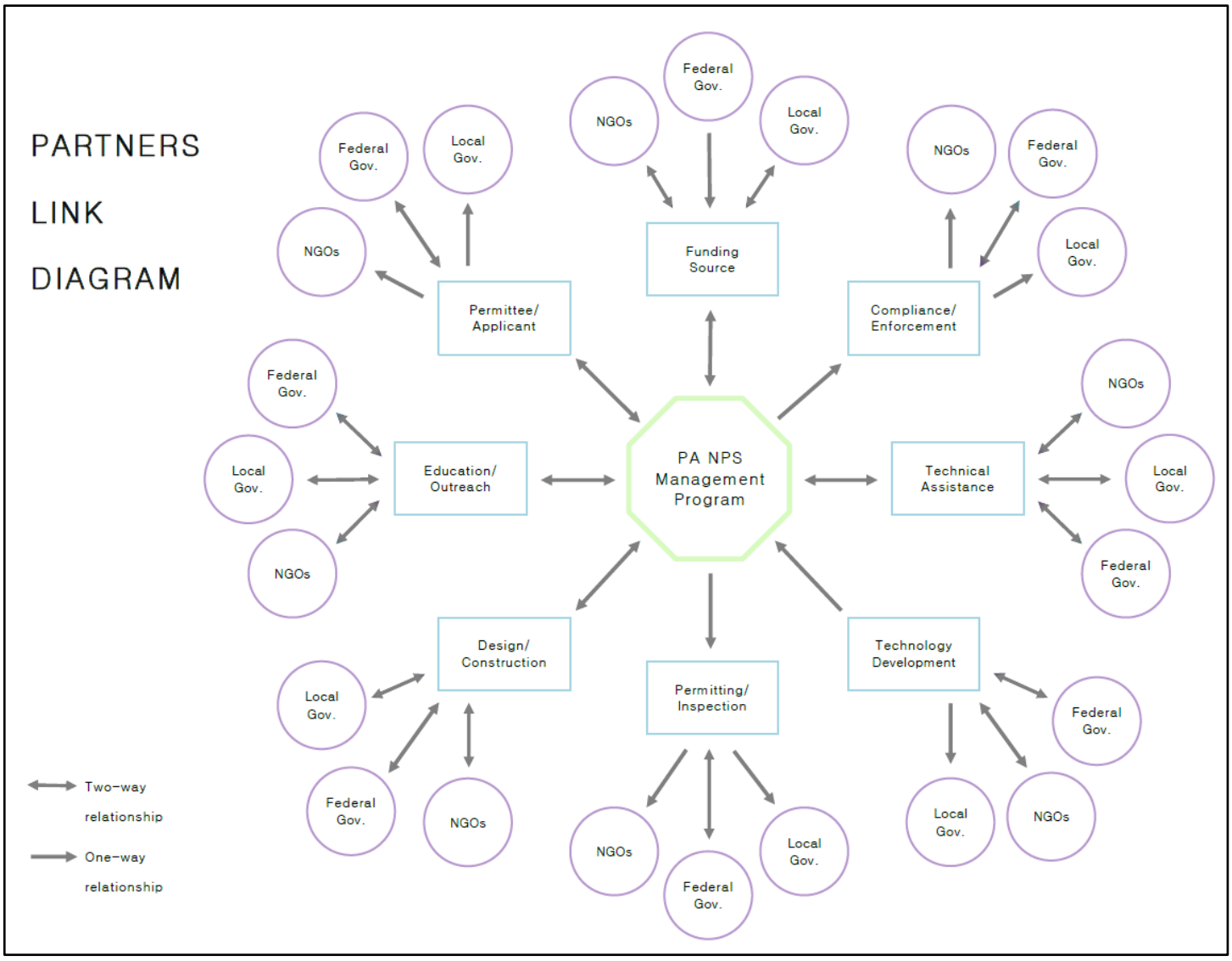

Figure 4: A graphical representation of the partnering-web as it exists within Pennsylvania and with respect to NPS pollution management. The center octagon represents the concert of state agencies involved with NPS pollution abatement. For clarity, education institutions may be considered commensurate with NGOs.

It should be understood that Figure 4 above is one of many ways in which the partnering web can be depicted. In this particular figure, the PA NPS Management Program is placed in the center. That hub broadly represents the activities of DEP and other state agencies. It could be just as beneficial to place NPS pollution as the hub by which all partners and their activities are linked. Certainly, it is the reality of that category of pollution that unifies the efforts of these partners.

Looking at Figure 4 above, it can be seen that each of the partner-types are connected to each other and Pennsylvania's NPS Management Program through certain functional areas, responsibilities or abilities. Each of the partner-types are connected to each of the functional areas, though not every partner under a given partner type may actively engage in a given functional area. In most cases the relationships through these functional areas are bilateral partnerships, but unilateral relationships, primarily with respect to certain regulatory activities, do exist. To more fully understand the partnering-web in PA, review Figure 4 in conjunction with Table 3, Table 4, and the descriptions below.

In association with Figure 4 above is a list of descriptions of program partners at all levels (local, state, and federal government as well as other sectors such as non-profit organizations and institutions of higher education). The descriptions below are by no means meant to be exhaustive. The partnering web found within Pennsylvania is vast and intricate. The full list of partners, even by the broad categories offered below is too lengthy to include in this report. Those listed below may be more prolific or overt in their work to address non-point source pollution, but that does not in any way discount the activities of any one specific group which may or may not be directly referenced.

A. Local government

The local governmental structure of Pennsylvania is slightly more complex than other states; within Pennsylvania beyond the county level, boroughs and townships provide citizens an additional level of local government and service. While the added complexity of local governmental levels does add to the complexity of some activities, it also affords those engaged in conservation an additional level of opportunity. Each municipality is a unique entity within which and by which conservation may occur. Progressive municipalities may be more willing or better positioned to engage in conservation efforts. Many municipalities do take a pro-active stance on stormwater management, soil conservation, stream restoration and other work that aids in the control of non-point source pollution. There are over 2,500 municipalities (not including counties) in Pennsylvania. Each municipality is a potential partner in the control of non-point source pollution.

The link below provides more information on the local government structure in Pennsylvania:
http://www.livingplaces.com/PA/Pennsylvania_Local_Government.html

DEP has in the past and will in the future work with municipalities to effectively address nonpoint source pollution issues. In a direct manner, DEP will continue to encourage municipalities to comply with existing state regulatory requirements, such as Act 167 and MS4. As has occurred in the past, Pennsylvania will continue to encourage municipalities to embrace existing financial tools such as the Section 319 Grant and Growing Greener Grant funding programs to implement projects for the betterment of our water resources. Further, it is expected that certain municipalities will, without prodding or encouragement, adopt the philosophies and subsequent practices that effectively address NPS pollution issues. In addition, DEP works with municipalities through various projects and educational activities that are funded by DEP programs such as the Section 319 and Growing Greener Programs.

Conservation Districts (CDs) are a unique member of the "local government" set at the county level. CDs were brought into existence through the Conservation District Law of 1945 to serve as a primary local government unit responsible for the conservation of natural resources in this commonwealth and to be responsible for implementing programs, projects and activities to quantify, prevent and control nonpoint sources of pollution. Conservation Districts provide citizens a local office through which soil and water resource conservation services can be obtained. In Pennsylvania, the 66 CDs function uniquely for the purpose of protecting and assisting citizens in protecting the soil and water resource. CDs engage in a multitude of programs, projects, and other activities focused on the management of NPS pollution. While

each CD is unique, and tailors their activities to the needs of their particular county, most CDs share at least three general functions. CDs function as regulator, grantee, and educator. As regulator, CDs implement permitting and inspection services, as grantees, CDs receive grant funds and implement restoration projects with those funds, and as educator, CDs deliver presentations and implement programs in classrooms, for the general public, and professionals, spreading the message of conservation and restoration.

B. Pennsylvania State Agencies

1. Pennsylvania Department of Agriculture

The Pennsylvania Department of Agriculture (PDA) supports and oversees agriculture and related industries throughout the commonwealth while providing consumer protection through inspection services that impact the health and financial security of Pennsylvania's citizens. PDA supports the implementation of agricultural practices that promote the economic viability of farms while protecting the natural resources that are important to the farming community. Those natural resources include soil and water. PDA oversees a number of programs that reduce nonpoint source pollution entering streams, rivers and lakes. With respect to soil and water conservation, some of the programs implemented by PDA include the: Resource Enhancement and Protection program (REAP), Manure Hauler and Broker Certification Program, Nutrient Management Specialist Certification Program, CHEMSWEEP waste pesticide disposal program, Integrated Pest Management program, the Pesticide Applicators Certification and Technical Registration program, Pesticide Product Registration, and Pennsylvania's Nutrient Management Program.

The PDA also works closely with the Penn State and other similar institutions to direct and fund research initiatives that are key to helping the agricultural industry find innovative ways to address nonpoint source pollution associated with agricultural activities.

http://www.agriculture.state.pa.us/portal/server.pt/gateway/PTARGS_0_2_24476_10297_0_43/AgWebsite/Page.aspx?name=About-PDA&navid=30&parentnavid=0&pageid=9&

2. Pennsylvania Department of Transportation

The Pennsylvania Department of Transportation (PennDOT), is the agency responsible for the state-owned roads and bridges among other things. As such, this agency is also responsible for a substantial number of pipes and outfalls that collect, convey and discharge stormwater and other associated non-point source pollutants. PennDOT, by virtue of its assets and the construction and maintenance work it performs, is a logical partner in the task of managing NPS pollution. Further, PennDOT is a partner in the effort to abate NPS pollution through the maintenance of a wetland mitigation bank. This wetland mitigation bank provides PennDOT the opportunity to construct viable wetlands in lieu of wetlands impacted by roadway and bridge construction projects. The construction of mitigation bank wetlands should provide for a wetland system that functions at a greater level of efficiency and is therefore more capable of addressing NPS pollutants.

http://www.dot.state.pa.us

3. Department of Conservation of Natural Resources

Pennsylvania's Department of Conservation of Natural Resources (DCNR) is the agency responsible for oversight of State Parks and State Forests. As such, this agency is a significant land owner. Within the bounds of those Parks and Forests there exist certain features that contribute to NPS pollution; those features include impervious surface, tillable land, and dirt, gravel, and low volume roads among other features. Further, DCNR engages in education and outreach activities designed to inform the public on NPS pollution issues as well as other topics of environmental concern. DCNR routinely engages in NPS pollution mitigation projects including trail, bank, and shoreline stabilization projects. Further, DCNR engages in education and outreach efforts as it interacts with the tens of thousands of annual visitors to the parks and forests of Pennsylvania.

http://www.dcnr.state.pa.us/

4. Fish and Boat Commission

The Pennsylvania Fish and Boat Commission (FBC) has the responsibility of managing the commonwealth's fisheries. As such, this agency manages lakes, rivers, and streams for the purpose of maintaining healthy fish populations. To accomplish this goal, FBC maintains certain regulatory and law enforcement authority as well as provides Education and Outreach efforts to further the public's understanding of water resource conservation in the commonwealth. Like DCNR, FBC engages in bank and shoreline stabilization projects oftentimes in association with fish habitat improvement projects. FBC also engages in NPS pollution BMP installation such as the installation of floating wetlands on public lakes.

https://www.fish.state.pa.us/

5. Pennsylvania Game Commission

The Pennsylvania Game Commission (PGC) is the entity responsible for managing the wildlife resource in Pennsylvania. This agency oversees hunting and shooting within the commonwealth. The PGC is also a significant "land owner" in that the PGC manages all of Pennsylvania's State Game Lands (SGLs). SGLs comprise 5% of Pennsylvania's total land area, encompassing approximately 1.5 million acres of forest, wetland, and farm fields. Many of the SGLs also include or border water resources and also include minor civil improvements such as dirt, gravel, and low volume roads, administrative and management buildings and the like. Given the quantity of land managed by the PGC, this entity is a logical partner in the task of managing NPS pollution.

http://www.pgc.state.pa.us/portal/server.pt/community/pgc/9106

6. Department of Environmental Protection

DEP is the primary agency engaged in the restoration and protection of Pennsylvania's air, land and water from pollution including that which comes from nonpoint sources and serves as the lead agency in administering Pennsylvania's Nonpoint Source Program. DEP works with a very diverse set of partners including individuals, organizations, governments and businesses to prevent pollution and restore our natural resources. DEP oversees a wide array of regulatory and non-regulatory programs in order to accomplish this mission. Among those programs is the responsibility to administer major provisions of the state's Clean Streams Law and the federal Clean Water Act. DEPs' Office of Water Management plans, directs and coordinates departmental programs associated with the management and protection of the commonwealths' vast water resources. Staff administers and oversees departmental programs involving surface and groundwater quantity and quality planning, and soil and water conservation. The office also coordinates policies, procedures, and regulations which influence public water supply withdrawals and quality, sewage facilities planning, point source municipal and industrial discharges, encroachments upon waterways and wetlands, dam safety, earth disturbance activities and control of storm water and non-point source pollution. In addition, the Office of Water Management also coordinates the planning, design and construction of flood protection and stream improvement projects.

http://www.portal.state.pa.us/portal/server.pt/community/water/6008

7. State Conservation Commission

The Pennsylvania State Conservation Commission (SCC) is a 14-member commission that has a primary mission to ensure the wise use of Pennsylvania's natural resources and to protect and restore the natural environment through the conservation of its soil water and related resources. The Commission is a departmental administrative commission under the concurrent authority of DEP and PDA. The commission provides support and oversight to the states 66 county conservation districts for the implementation of conservation programs such as: the Nutrient Management and Odor Management Program, the Dirt, Gravel, and Low Volume Roads Program (pollution prevention), Resource Enhancement and Protection (REAP Tax Credit) Program and the Leadership Development Program. The commission also provides oversight and professional certification for nutrient management specialists, odor management specialists and manure haulers and brokers.

http://www.agriculture.state.pa.us/portal/server.pt/gateway/PTARGS_0_2_24476_10297_0_43/AgWebsite/OrganizationDetail.aspx?orgid=21

8. PENNVEST

The Pennsylvania Infrastructure Investment Authority (PENNVEST) provides low interest loans and grants for sewer, nonpoint source, storm water and drinking water projects throughout the commonwealth. PENNVEST has been empowered by Pennsylvania state law, Act 16 of 1988, to administer and finance the Clean Water State Revolving Fund (CWSRF) and the Drinking Water State Revolving Fund (DWSRF) pursuant to the federal Water Quality Act of 1987. PENNVEST also finances, through the issuance of

special obligation revenue bonds, water management, solid waste disposal, sewage treatment and pollution control projects undertaken by or on behalf of private entities. From the timeframe of July 2010 through October 2013, PENNVEST has invested more than $30 million in loans and $27 million in grants to support the implementation of nonpoint source projects and BMPs on agricultural operations and urban stormwater sites. PENNVEST working in conjunction with the DEP, serves as the host for auctions for the sale and purchase of nutrient credits in the Susquehanna and Potomac watersheds. PENNVEST serves as the central counterparty and clearinghouse for nutrient credit trading auction transactions.

http://www.pennvest.state.pa.us/portal/server.pt/community/about_us/9320

C. Federal Government

In broad terms, the Federal Government maintains a presence in the commonwealth of Pennsylvania. Various branches of the Federal government operate in the commonwealth and provide a wide variety of services. Work performed by these Federal agencies, either collaboratively with DEP, with other entities or independently, does have a significant impact on the health of the waters of the commonwealth. With respect to NPS pollution abatement, DEP attempts to collaborate most closely with the federal agencies whose work most directly focuses on the same. The EPA, OSM, and NRCS are frequent and prolific Federal partners in to that end. Any information made available to DEP from federal agencies that directly relates to NPS pollutant load reductions is accounted for in the WPT tool. BMP implementation data associated with practices installed using NRCS funding has not been readily available to DEP for reporting, but work continues to develop a process to receive aggregated data summarizing activities completed with NRCS support.

1. Environmental Protection Agency

The Environmental Protection Agency (EPA) maintains an office in Philadelphia and provides the commonwealth with a variety of services, not the least of which is funding and guidance for a variety of projects including NPS pollution management, brownfields remediation and many others.

2. Department of Defense

Military installations such as the Letterkenny Army Depot, the Army War College, and the Navy Ships Parts Control Center are examples of the Federal presence in Pennsylvania, each of which are part of the Department of Defense (DOD).

3. Department of Commerce

The Department of Commerce maintains the National Oceanic and Atmospheric Administration (NOAA). NOAA protects, preserves, manages, restores and enhances the nation's coastal resources and ecosystems along the 95,439 miles of the US shoreline. While Pennsylvania is not commonly thought of as a coastal state, there are two coastal areas within Pennsylvania's jurisdiction (Lake Erie and the Delaware Estuary). DEP maintains a partnership with NOAA in the implementation of the Coastal Resources Management Program.

4. Department of Agriculture (USDA)

The United States Department of Agriculture (USDA) operates extensively in Pennsylvania under the flag of several different entities. The Natural Resource Conservation Service (NRCS) and the Forest Service (USFS) and the Farm Service Agency (FSA) are examples of USDA agencies which work very closely with PA DEP on NPS related issues.

The NRCS actively engages the agricultural community performing design and survey work as well as offering construction oversight for soil conservation projects located on farms. The NRCS offers a variety of programs involving technical and financial assistance focused in-part on the conservation of soil and water resources, and the improvement of agricultural operations. Further, the NRCS will occasionally conduct research to enhance the common understanding of conservation on agricultural operations. In broad terms, the NRCS offers programs under the Farm Bill, provides technical assistance, and implements easement programs, among other things.

The FSA oversees a number of voluntary conservation-related programs that work to address a large number of farming and ranching related conservation issues including: drinking water protection, reducing soil erosion, and preservation and restoration of forests and wetlands. Some of the major programs they administer in Pennsylvania include the: Conservation Reserve Enhancement Program (CREP), Conservation Reserve Program (CRP), Grassland Reserve Program, and the Source Water Protection Program.

5. Department of Interior

The Department of Interior (DOI) has a presence in the commonwealth, notably for the purpose of this report, as the Office of Surface Mine Reclamation (OSM) and the National Park Service (USNPS). The work of OSM also directly relates to the objectives of BCR in that the work of OSM focuses on AMD reclamation and therefore, the abatement of NPS pollution. Reportable work performed by OSM is accounted for with the BMP Tracker tool.

D. Non-profits and citizen groups

Pennsylvania is fortunate to have a significant amount of involvement in the effort to address NPS pollution from non-profit groups and other non-government organizations (NGOs). While the list is too long to include here, and at the risk of failing to reference all of the key players, it should be noted that over the past several decades the challenge of curtailing NPS pollution and improving the water resource in Pennsylvania has benefitted from NGO involvement. It is expected, though not taken for granted, that the efforts of these individuals (oftentimes volunteers) and these entities will continue. The continued effort of these NGOs to provide: education and outreach, BMP implementation and maintenance, project coordination, and other similar efforts is a vital and foundational aspect of this Plan.
http://pawatersheds.org/membership/watershed-groups/

E. Colleges and universities

Pennsylvania is home to 14 universities in the state system of higher education. Additionally, Pennsylvania is home to over 155 private colleges and universities. These institutions offer unique learning experiences to their students; they also offer unique services to the communities in which they exist. While some colleges are located in very rural areas, others are in the midst of Pennsylvania's largest cities. Many of these institutions offer premier education in the fields of Ecology, Environmental Science, Civil and Environmental Engineering, Planning, Geography, Agriculture, Energy Resource Management, and other disciplines which complement this program's objectives. As such, certain institutions make logical partners in the work of non-point source pollution management. Some of those institutions do directly engage in research that furthers the work of non-point source pollution management such as the stormwater management research being done at Villanova University, while others are more on the periphery. Regardless, most if not all of the colleges and universities in Pennsylvania offer sites on which non-point source pollution could be addressed.

An abridged list of these partners, both federal and state agencies, NGOs, and others can be found in Table 3 above.

V. Programs and Projects

This section of the NPS Management Plan provides a summary of existing statewide programs. These programs vary in function and focus. Some of these programs are regulatory while others provide technical or financial assistance, some focus on restoration while others focus on protection. Regardless, each of these programs provide time, money and other resources to the management of NPS pollution in Pennsylvania.

Watershed management is driven by people living in or otherwise connected to a watershed and promotes locally defined solutions and partnerships. Such local commitment ensures a high degree of implementation and stewardship. Watershed management also saves money. Financial efficiencies can be realized through watershed-wide education, monitoring, permitting, funding, and pollution prevention activities. Cost savings through pollutant trading and innovative technology development are also a product of integrated watershed protection. In addition, watershed management is recognized as a cost-effective way to maintain a high level of drinking water quality. Implementing efforts on a watershed scale and perspective provide the greatest opportunity to see water quality improvements on-the-ground for impaired and threatened streams, lakes and rivers. Most importantly, watershed management unleashes local creativity, enabling problems to be solved and resources protected in the best possible way through the least expensive means.

Planning and prioritizing work at the small watershed level such as the 12 digit Hydrologic Unit Code (HUC) scale or smaller provides the opportunity to see water quality and aquatic life improvements sooner.

Pennsylvania supports a simple six-step approach to watershed stewardship as listed below:

1. Watershed organization development and sustainability
2. Securing financial and human resources
3. Watershed assessments
4. Developing the watershed restoration or protection plan
5. Implementation
6. Monitoring for success

Progress is measured by comparing our implementation efforts to the goals outlined in the plan and is also assessed through monitoring of water bodies within the watershed. An effective overall comprehensive watershed management approach relies heavily on ever-improving electronic technology. Water quality assessments, accessible data, and land use information are all important components of a successful watershed management program. DEP will continue to use and improve reliable electronic databases, use GIS as an effective means of displaying and analyzing data, and use satellite imagery to determine land use and track land use trends. In addition, it is DEP's goal to make as much information as possible, available in a live and usable format to the general public over the DEP website.

Over the past 30 years, Pennsylvania has made significant strides toward reducing and eliminating pollution from industrial and municipal wastewater discharges. These efforts have been so effective that Pennsylvania's 2012 Integrated Water Quality Monitoring and Assessment Report documents that only 2.6% of surface water quality impairment in the commonwealth can be attributed solely to municipal and industrial point sources. The remaining 97.4% is linked primarily to NPSs sources such as: abandoned mines, agriculture, urban runoff, failed septic systems, and air deposition–that must be managed comprehensively to achieve meaningful and lasting results. Watershed management emphasizes specific geographic areas and directs attention toward meeting tangible environmental goals.

As recommended by the guidance driving the creation of this document, the following section of this document lists certain program areas in which the NPS program operates. These program areas are in many cases pollutant sources (*e.g.*, construction run-off), while in some cases the program areas are described by certain activities (*e.g.*, resource extraction) or specific resources (e.g. lakes). In all cases, the program areas were created to best organize and focus the pollution abatement activities associated therewith. After this section (Program Areas), which is a general overview of areas or categories in which programs could be organized, the reader will find a section which provides descriptions of specific programs focused on addressing NPS pollution within Pennsylvania. This section is further divided between assessment and monitoring programs, restoration focused programs and regulatory programs, which are by design protective of existing uses. As was requested in the guidance provided by the EPA governing the drafting of this document, a description of programs that both restore and protect the resource is provided.

A. Program Areas

1. Resource Extraction

Past practices of resource extraction and exploration are a major source of NPS pollution to surface and groundwater in Pennsylvania. Significant deposits of bituminous and anthracite coal, oil, and gas occur within Pennsylvania. Coal is found in the western, northcentral, and northeastern portions of the commonwealth and oil and gas deposits are concentrated in the western and northcentral portions of the commonwealth. Polluted water coming from these past mining sites, referred to as abandoned mine drainage (AMD), is oftentimes the result of water coming into contact with sulfur-bearing minerals, resulting in the formation of sulfuric acid which can leach heavy metals from rocks that come in contact with this acidic water. This type of AMD is quite common in the coal producing regions of Pennsylvania.

At one time, the acronym AMD referred to "acid mine drainage." Currently, and more correctly, the meaning of this term has changed because in some cases the discharge from abandoned mines is actually alkaline. If the acidic water that was formed flows through some local strata containing limestone, the acidity will be neutralized and become alkaline. The metals from the first reaction will still be present and will still have a negative impact on the receiving watershed, but that watershed is not impacted by the acidity of the discharge.

Pennsylvania's energy resources are not limited to coal. Pennsylvania was historically a major producer of oil and has more recently become the second largest producer of natural gas in the nation. It is estimated that over 350,000 oil and gas wells have been drilled in Pennsylvania since the industry began over a century ago. DEP is tasked with the oversight of the oil and gas industry's activities relating to that industry's nonpoint source environmental responsibilities. This oversight is accomplished through the permitting and inspection of new oil and gas well site development and operation, implementation of erosion and sedimentation control plans during the well construction phase, and oversight of activities relating to the plugging of abandoned and orphaned oil and gas wells.

Abandoned oil and gas wells can also contribute to the AMD problem in some parts of the state. In mined areas water contaminated by AMD can find its way to the surface through old wells. AMD discharges from an abandoned well can be eliminated by plugging.

2. Agriculture

Agriculture is one of Pennsylvania's largest and most productive industries. According to Pennsylvania's 2014 Integrated List, agriculture is one of the top two sources of NPS impairment in the state. Examples of NPS pollution associated with agriculture include soil erosion and resulting sedimentation into waterways, improper manure and fertilizer management, which can yield a discharge of nutrients into surface and groundwater, improper manure storage, which may result in a discharge of manure into surface and groundwater, and the unintended effects of pesticide use and disposal. Significant local, state, and federal efforts have been made to reduce soil erosion, sedimentation and other NPS pollution-related issues

associated with agriculture. State and federal agriculture and cost-share program funds are being used to reduce the amount of NPS pollution originating from agricultural activities.

3. Construction Runoff

This NPS pollution category encompasses two major subcategories: highway redevelopment construction and new land development. Land development typically includes residential, industrial, commercial, institutional, and recreational construction. Uncontrolled runoff from both highway construction projects and land development projects can cause significant soil erosion and localized sediment pollution in streams and other water bodies. Through the implementation of regulatory programs and through partnering amongst certain entities such as DEP, PennDOT, conservation districts, and the regulated public, Pennsylvania continues to address soil loss and sedimentation issues which may originate from these activities.

4. Hydrologic/Habitat Modification (Urban Run-off)

Indirect changes in hydrology within the watershed that result in nonpoint pollution to surface waters include: changing land uses, increasing impervious surface areas, lack of stormwater management, lack of floodplain management, and removal of riparian vegetation. Hydrologic modification such as channelization, dredging, dam construction, bridge construction, and any encroachment into a body of water or watercourse are regulated in Pennsylvania and require permits. Some of the activities mentioned in this paragraph cause many types of NPS pollution. Certain inorganic and organic pollutants as well as stormwater volume are more commonly associated with certain land use types. So, as land uses change, so do the pollutants. Land use changes have a causal relationship with other NPS issues as well. For example, the fifth program area, Stream Bank Erosion, is directly connected to hydrologic modification. Increased stormwater flow in receiving streams can contribute to stream bank erosion.

5. Stream Bank Erosion

Stream bank erosion and the subsequent release of soil into the waters of the commonwealth is a significant issue. This problem is the result of many factors including the buildup of legacy sediments in the floodplain, expedited discharges of elevated quantities of stormwater resulting from absent or inadequate stormwater management (see number 4 above), and the removal of streamside vegetation. Public partners have, over the past decade, developed a much higher awareness of this concern and major work is being done in Pennsylvania to reduce the occurrence and impact of stream bank erosion.

6. Lakes

Section 314 of the Clean Water Act focuses on lakes. While most other program areas are described by the source of the pollution (e.g. stream bank erosion) or the pollutant (e.g. AMD), the lakes program is labeled by the resource for which that program is designed to protect. Lakes are common in Pennsylvania and the water quality issues surrounding lakes are unique. As such, it was determined that a unique program, devoted to this environmentally and economically important resource was necessary. Clean Lakes

Initiatives are now funded through Section 319. Public and nonpublic lake initiatives are also funded through Pennsylvania's Growing Greener Program. Pennsylvania has approximately 1,500 lakes and reservoirs that total about 161,000 water acres. The State Park System includes 150 lakes and ponds located in 72 different parks and includes a total of 33,460 water acres. Boating, swimming, fishing, and other recreational activities are often a part of a lake community.

Pennsylvania's lake management regulation is codified in 25 Pa. Code Section 96.5 – Nutrient discharges, which sets forth treatment requirements for point source discharges necessary to control eutrophication. While these regulations were at one time located in 25 Pa. Code Section 95, that section was repealed in 2000. The preamble to the proposed regulations indicates that "Portions of Chapter 95, including §§ 95.2, 95.7 and 95.8, are being moved, sometimes in modified form, to Chapter 92a. Other portions, including §§ 95.3 and 95.6 are being incorporated, sometimes in modified form, into proposed Chapter 96." It further states that: The newly proposed 96.5(b) is based on existing § 95.6(a) and provides that to control eutrophication in a lake, pond or other impoundment, the Department will develop a TMDL and associated waste load allocations (WLAs), and load allocations (LAs) based on annual loading estimates. Eutrophication occurs due to increased levels of nutrients in a lake and is manifested in algal blooms. Lake trophic status is based on Carlson's Trophic Status Index (TSI). If a lake indicates TSI values of 50--80, the Department requires phosphorus controls for point sources discharging into the lake or discharging into waters flowing into the lake.

DCNR has also developed a Lake Management Plan for state park lakes that identifies individual lake needs. These individual problems were, in the past, excluded from the overall maintenance and planning concerns of the parks. The challenge in lake management is to involve the people in the watershed in preventing NPS pollution and restoring riparian habitat, as well as to identify and permit in-lake practices that can mitigate lake problems while the watershed is being restored.

The commonwealth's Lake Protection and Restoration Program is supported mainly by EPA's NPS Management Program, Section 319 of the Clean Water Act. Program goals to restore and/or protect lake water quality are based on studies that identify impairments, pollution sources, and recommendations for remediation. Public uses and lake benefits and watershed priority based on impairment are important criteria in prioritizing lakes to be funded for studies and/or restoration. Impairment screening is done to determine the Trophic State Index (TSI), aquatic life, human health and recreational uses, and the need for more in-depth (EPA Clean Lakes Phase I type) studies. Phase I assessment/feasibility studies evaluate existing water quality conditions, identify sources and magnitude of pollutants, identify water quality violations, and determine impacts on uses. Phase I evaluations also include a review of feasible control and restoration methods and recommend lake and watershed management strategies to restore or protect water quality. Phase II projects continue documentation of water quality conditions and implement BMPs, as recommended in the Phase I management plan. Many of our original Clean Lakes Phase I projects completed in the 1990s are implementing recommended BMPs.

7. Silviculture

The major NPS pollution concern with silvicultural activities is soil erosion and the resultant sediment loading to surface water from timber harvesting and road construction. BMPs have been used to reduce the effects of such problems. Chapter 102 of DEP's rules and regulations requires that an E&S plan be developed for every earth disturbance activity. Implementation of program activities are shared by DEP and county conservation districts, including the processing and issuance of earth disturbance permits, complaint handling, site inspections, and compliance activities. Pennsylvania's *Best Management Practices for PA Forests manual* provides guidance to the industry relating to proper forest and harvesting management techniques and BMP implementation.

8. Land Disposal

The land disposal category covers several non-point sources of pollution, including improper disposal of household hazardous waste (HHW), illegal dumps, improper land application of municipal biosolids, and malfunctioning on-lot sewage treatment systems. Improper disposal of HHW has been shown to cause significant degradation of surface and groundwaters. This source of pollution is addressed through programs administered by the Bureau of Waste Management. The impact of illegal dumps, both active and abandoned, on waters of the commonwealth is still largely undefined. The land application of municipal biosolids, if properly carried out, offers significant nutrient reuse benefits. If not properly managed, however, it can pose a nonpoint threat to surface waters. Pennsylvania's many on-lot sewage treatment systems are also potential sources of nonpoint pollution to groundwater. Programs regulating these sources are administered by the Bureau of Point and Non-Point Source Management.

9. Other NPS Category

In addition to Pennsylvania's NPS pollution categories that have been approved for use with Section 319 NPS grant funds, "other" categories exist, such as atmospheric deposition. Although this category is not approved for Section 319 NPS grant funds, it may be eligible under other funding programs such as Growing Greener.

Nonpoint Source Pollution Management Programs Active in Pennsylvania

	E&O	Tech. Assist.	Financial Assistance	Monitoring	Information/Data Tracking	Comp./Enf.	R&D	BMP IMP
§319 Program	X	X	X	X	X		X	X
Growing Greener	X	X	X	X	X			X
AML Program		X	X	X	X		X	X
SMCRA		X	X	X	X		X	X
Well Plugging								X
Chesapeake Bay Program	X	X	X	X	X		X	X
EQIP			X					X
CREP/CRP	X	X	X					X
Nutrient Management Act Program	X	X			X	X	X	
IPM Program	X	X	X		X			X
CAFO	X				X	X		
Dirt, Gravel, and Low Volume Roads Program	X	X	X		X		X	X
Stormwater Management Act 167 Program	X	X				X		
NPDES	X				X	X		
Stream Relief	X				X			X
Forest Stewardship Program	X	X						
On-lot Sewage Program	X		X		X			X
SSWAP				X	X			
Sea Grant	X							
Delaware Estuary Program	X		X	X	X		X	X
Great Lakes Initiative	X		X	X	X		X	X
SWAPP	X	X		X	X			
Well Head Protection Program	X			X	X	X		
Great lakes Basin (E&S) Program	X	X			X			X
Nutrient Trading			X		X			
Ch. 102 E&S Program	X	X			X	X		
Act 537 sewage facilities program	X				X	X		
PACD NPS education program	X		X				X	X
Watershed Ed for Pollution Prevention, WREN	X		X					X
WPCAMR Quick Response Program		X	X					X
TreeVitalize	X	X	X					X
Master Watershed Steward Program	X	X						X

NPS Management Programs (state-wide, all partners) cont.	E&O	Tech. Assist.	Financial Assistance	Monitoring	Information/Data Tracking	Comp./Enf.	R&D	BMP IMP
NPS National Monitoring Program	X			X	X		X	X
PENNVEST			X					X
TMDL Program		X		X		X		
Regional Ag Watershed Assessment Program	X	X	X	X	X	X		X
PACD TAG Program		X						X
AMD Technical Assistance Program - TU		X						X
National Water Quality Initiative (NWQI)		X	X	X				X
Groundwater Quality	X			X				
Lake Water Quality Assessment				X	X			
Restoration Potential Indexing					X			
Watershed Implementation Planning		X		X	X			
PA State Water Planning								
PA Rivers Conservation Program	X	X	X		X			X
Coastal Nonpoint Pollution Program (CZARA 6217)	X	X	X		X			
Citizens Volunteer Monitoring Program	X			X	X			
Commonwealth Financing Authority (CFA)			X					
Regional Conservation Partnership Program (RCPP)	X	X	X					X
Manure Management Program	X	X				X		
Biosolids Program	X				X	X		

Table 4: An abridged listing of programs active within Pennsylvania and focused on the abatement of NPS pollution. Note, this is not a complete list: the full listing of programs operated by all partners engaged in NPS pollution abatement in Pennsylvania is too lengthy for the purpose of this report. The abbreviations as used above are: E&O-Education and Outreach, Tech. Assist.-Technical Assistance, Comp./Enf.-Compliance and Enforcement, R&D-Research and Development, BMP IMP-Best Management Practice Implementation.

B. Assessment and Monitoring Programs

1. Statewide Surface Water Assessment Program (SSWAP)

DEP's plan for achieving statewide assessment of its surface waters was completed by the end of the year 2006 and included implementation of a program to evaluate all unassessed free-flowing streams. DEP used a strategy for these assessments that involved preliminary screening of each watershed followed by a field-level biological assessment. Full-scale fieldwork for the Statewide Surface Water Assessment Program (SSWAP) (formerly known as Unassessed Waters Program) began in 1997. This was a cooperative effort, with assessments being conducted by DEP's six regional offices, the Susquehanna River Basin Commission (SRBC), the Interstate Commission on the Potomac River Basin (ICPRB), the PFBC, and central office staff. As of the end of the 2006 SSWAP survey season, 100% of the State Water Plan watersheds were completed. These assessments have included sampling at more than 18,910 stations, representing over 83,000 wadeable stream miles (97% of Pennsylvania's total 86,000 stream miles).

Pennsylvania's long-standing monitoring programs are primarily oriented toward identifying water quality problems and taking action to abate pollution. Although the location of point source discharges is generally well known, and effluent quality from point sources is monitored regularly, NPSs were not well defined and the extent and severity of NPS impacts had not been totally identified prior to 1997. Consequently, a goal of SSWAP is to evaluate unassessed free-flowing streams in Pennsylvania to identify NPS impacts, lesser known point source impacts, and combined NPS/point source impacts and to protect unassessed waters that are found to be of HQ or EV. Biological screening was conducted on wadeable waters using a modification of EPA's Rapid Bioassessment Protocol (RBP) II, which includes field identification of benthic macroinvertebrates to the family level and an RBP habitat assessment. Each biological screening results in an assessment summary for input to the Section 305(b) assessment database that identifies waters with obvious water quality impairment and those with no obvious impairment.

a. Integrated Assessment and Listing

In 2004, DEP adopted an integrated format for Clean Water Act Section 305(b) reporting and Section 303(d) listing, which is published biennially. The current report is entitled, the "2014 Pennsylvania Integrated Water Quality Monitoring and Assessment Report" and satisfies the requirements of both Sections 305(b) and 303(d). The combined 305(b) report and 303(d) list is commonly referred to as the "Integrated List."

This report is available on the DEP website at:
http://www.portal.state.pa.us/portal/server.pt/community/water_quality_standards/10556/integrated_water_quality_report_-_2014/1702856

All surface waters in Pennsylvania have multiple designated uses that include various water supply and recreational uses as well as a specific fish and aquatic life use. EPA encourages states to report on the status of a number of uses in the Sections 305(b) report and 303(d) listing process. In 2006, DEP reported on human health uses (fish consumption and drinking water) and water contact recreation (swimming) in addition to the traditional reporting on fish and aquatic life use support.

The waterbody-specific use support status of Pennsylvania's waters is presented in the 2014 Integrated List using a five-part characterization. The listing categories are:

Category 1: Waters attaining all designated uses.

Category 2: Waters where some, but not all, designated uses are met. Attainment status of the remaining designated uses is unknown because data are insufficient to categorize the water.

Category 3: Waters for which there are insufficient or no data and information to determine if designated uses are met.

Category 4: Waters impaired for one or more designated use but not needing a TMDL. These waters are placed in one of the following three subcategories:

• Category 4A: TMDL has been completed.
• Category 4B: Expected to meet all designated uses within a reasonable timeframe (3 years).
• Category 4C: Not impaired by a pollutant.

Category 5: Waters impaired for one or more designated uses by any pollutant.

Category 5 includes waters shown to be impaired as the result of biological assessments used to evaluate aquatic life use even if the specific pollutant is not known, unless it can be demonstrated that non-pollutant stressors cause the impairment or that no pollutant(s) cause or contribute to the impairment. Category 5 constitutes the Section 303(d) list that EPA approves or disapproves under the Clean Water Act. Where more than one pollutant is causing the impairment, the water remains in Category 5 until all pollutants are addressed in a completed, EPA-approved TMDL or it meets criteria for delisting.

Because of the volume of the five-part list, it is only available electronically on DEP's website at: http://www.portal.state.pa.us/portal/server.pt/community/water_quality_standards/10556/integrated_water_quality_report_-_2014/1702856

b. Aquatic Life Use Support

A total of 84,571 miles of stream assessments for aquatic life use support conducted through September 2011 were included in the 2012 Pennsylvania Integrated Water Quality Monitoring and Assessment Report. All stream miles have been assessed to achieve comprehensive coverage based on the current GIS coverage. As of September 2012, 67,972 miles (80% of the assessed miles) supported the designated fish and aquatic life use. A total of 16,291 miles (19%) were reported as impaired for aquatic life use. The three largest sources of reported impairment were AMD, with 5,571 miles reported as impaired; agriculture, with 5,603 miles of reported impairment; and urban runoff/storm sewers, with 2,410 miles reported as impaired. The major causes of reported impairment on a statewide basis are siltation, metals, nutrients, and pH. Agricultural impairments are due to nutrients and siltation associated with surface runoff, groundwater input, and unrestricted access of livestock to streams. Low pH and elevated concentrations of heavy metals are the result of acid mine drainage and runoff from mine lands and refuse piles also contribute sediment. Increased levels of nutrients and siltation, along with flow variability, are associated with urban runoff.

A complete summary of aquatic life use support is presented in Table 2 of the 2012 Pennsylvania Integrated Water Quality Monitoring and Assessment Report. The table includes stream miles supporting designated fish and aquatic life uses, miles reported as impaired, and miles remaining to be assessed. A complete listing of the sources and causes of observed impairment on a statewide basis is presented in Table 4 of the report. A graphical representation of stream classifications, designated uses, assessment results, and other information is available on eMapPA, DEP's Web-based GIS system. Links and instructions to those resources are available through the 2014 Pennsylvania Integrated Water Quality Monitoring and Assessment Report.

c. Water Quality Network

The Pennsylvania Water Quality Network (WQN) is a statewide monitoring network with 125 fixed stations sampled bimonthly for stream discharge and chemical analysis and annually for a biological evaluation. In addition, 26 reference stations are sampled monthly for water quality and flow, and biological assessments are performed once a year, in either spring or fall. Approximately 15 lakes are also being routinely sampled. Fish are collected at about 20% of the stations each year. The tissues of these fish are sampled for contaminants that adversely affect human health.

d. Intensive Surveys

Intensive surveys have historically been a key element of DEP's water quality assessment program since their inception in 1965. These chemical and biological stream and lake investigations are conducted to gather background or baseline data on specific streams or lakes to determine the effects of point and/or NPS discharges on receiving water quality; to provide data in support of administrative or enforcement actions; to determine the source of spills of materials and evaluate their effect on water quality; and to assess the distribution and accumulation of trace metals and selected organics in fish tissue or sediments. These surveys can include any combination of chemical sampling of water, effluent, sediment or fish tissue, flow measurement, qualitative, quantitative, or semi-quantitative EPA Rapid Bioassessment Protocol (RBP) macroinvertebrate sampling, qualitative or quantitative RBP habitat assessment, or qualitative, and sometimes quantitative, fish sampling. While the current emphasis is on evaluation of unassessed waters, intensive surveys remain important to the commonwealth's water quality management program. An important element of DEP's program is evaluation of candidate waters for designation as HQ or EV waters. These targeted, intensive surveys involve field studies of habitat and the aquatic community, observation of land use, and file searches to determine if a basin or stream segment qualifies for designation as HQ or EV waters. Streams receiving HQ or EV designation are protected to maintain their existing quality.

e. Reassessment Protocol

With the completion of initial assessments in State Water Plan watersheds, DEP initiated a new assessment method, the ICE RBP reassessment protocol. This process uses a biological assessment protocol, as well as chemical and physical habitat characterization to establish whether aquatic life uses are impaired or not impaired. The ICE biological reassessments are conducted on wadeable waters using modifications of EPA's 1989 (RBP III) and 1999 RBPs, which include identification of benthic macroinvertebrates to the generic level and an RBP habitat assessment. This more intensive ICE protocol, as compared to the initial screening protocol, clarifies and confirms sources and causes of impairment, identifies segments at risk for impairment, and identifies segments that are no longer impaired. The resulting ICE biological assessment summaries will replace the original SSWAP entries in the Section 305(b) assessment database as this new protocol is phased in across the state. These assessment entries are used to monitor water quality trends by tracking biological condition changes over time and support data needs for TMDL development for those segments identified as needing TMDL calculations.

Prioritization of State Water Plan watersheds for reassessment is determined by TMDL needs and regional assessment priorities. A search for all available data (i.e., Section 305(b) assessment database and DEP stream files) is conducted for each State Water Plan watershed prior to reassessment, noting known impairments and potential sources of impairment. Within each assessment unit, a prescreening reconnaissance is conducted on all subwatersheds to familiarize the investigator with the unit, and its land use patterns, and to preliminarily site sampling locations.

For more information, see the following website:
http://www.depweb.state.pa.us/watersupply/cwp/view.asp?a=1261&q=535902.

2. Groundwater Quality

Major sources of groundwater contamination in Pennsylvania include industrial facilities, underground storage tanks, hazardous waste sites, abandoned landfills, aboveground storage tanks, manure/fertilizer applications, chemical facilities and septic systems. Specific activities under the groundwater protection, source water and wellhead protection, stormwater management, land recycling, mining and other programs continue to provide significant groundwater protection in Pennsylvania. DEP's Principles for Groundwater Pollution Prevention and Remediation, 383-0800-001, available on DEP's website, provides guidelines for prevention of groundwater pollution and remediation of contaminated groundwater. The ultimate goal is prevention of groundwater contamination and protection of groundwater uses.

a. Drinking Water Source Assessments

Source Water Assessments for all public water systems were completed in 2005. The assessments included delineation of the source water assessment areas, completion of a potential contaminant source inventory, and conducting a susceptibility analysis for each drinking water source serving a public water system in Pennsylvania. The drinking water source assessments were of the raw water quality of the source serving the public water system and not the finished water quality after treatment. The objective of the source water assessments was to rank the susceptibility of the drinking water source to existing or potential sources of contamination in the assessment area. These assessments support the implementation of the Drinking Water Program and provide a technical basis to assist voluntary development of local source water protection programs. The Source Water Assessment reports are available on DEP's website and are listed by county to support the public's ability to learn more about their local water supply.

See the following website for more information:
http://www.dep.state.pa.us/dep/deputate/watermgt/wc/Subjects/SrceProt/SourceAssessment/default.htm

b. Groundwater Assessment

Groundwater monitoring activities focus on groundwater resources that are near the land surface. These generally consist of the shallower groundwater as distinguished from the deep-set regional flow systems that change very slowly compared to the more dynamic shallow groundwater supply. It is these resources that are most likely to control the quality of streams under baseflow conditions and are most likely to be

used by our citizens for public and private water sources. Further, these shallow groundwater sources are more likely to become contaminated through NPS pollution.

Ambient and Fixed Station Network (FSN) monitoring is conducted on a semi-annual basis in selected groundwater basins. An overall report on data collected from 1985 to 1997 has been completed. All monitoring is conducted in accordance with program-specific regulations and DEP's Groundwater Monitoring Guidance Manual, 383-3000-001. The Ambient and FSN monitoring is conducted in accordance with Pennsylvania's Groundwater Quality Monitoring Network: Ambient and Fixed Station Network (FSN) Monitoring Programs, 383-3200-009.

3. Lakes Water Quality Assessment

Pennsylvania's definition of a "significant lake" is surface water with public access and a hydraulic residence time of 14 days or more. Pennsylvania now has 215 verified significant lakes totaling 99,022 acres. Another 146 public waterways are used as lakes but do not have a 14-day retention time. Lake assessments are done on both "significant" and "other" lakes with various partners including U.S. Geological Survey, EPA, citizen volunteers, DCNR, ACOE, and consultants. Since 1997, 228 lakes have been assessed using DEP's lake water quality protocol. Additional data on lakes (i.e., aquatic macrophyte coverage and fishery data) have been incorporated into assessments. Continued lake sampling, along with DEP regional office efforts, is part of DEP's plan for achieving comprehensive assessment.

Basic water quality assessments are done on lakes under three programs in Pennsylvania:

1. **Lake WQN:** A set of lakes is sampled by field office biologists once each summer for five years. Pennsylvania selects 10 to 15 lakes to include in this 5 year initiative.

2. **Lake TSI studies:** Field office biologists sample lakes to determine if phosphorus controls are needed for point source discharges in the watershed or as part of the unassessed waters program. Samples are collected three times in one year (spring, summer, and fall).

3. **Lake assessments required under a Memorandum of Understanding (MOU) with EPA as part of the unassessed waters program:** The collection protocol is the same as for TSI studies. Funding for this program, provided by EPA under a special appropriation grant in 1997, helped fund about 170 lake water quality assessments. That grant was closed as of March 2003. Citizen volunteer monitors were recruited and trained to collect lake data under this program since 2001, and citizen volunteers will continue to contribute to lake assessments through DEP's CVMP. To date, 20 citizen lakes have participated in our assessment program.

Lake data from these programs are reviewed to evaluate support of designated uses and compliance with water quality criteria. The results of these assessments are presented in the Section 305(b) listing.

C. Restorative Programs

1. Section 319, NPS Management Program

DEP's Bureau of Watershed Management (BWM) supports NPS pollution abatement projects with funding through grants under Section 319(h) of the Clean Water Act. The Section 319 NPS Management Program (319 Program) is DEP's program under the BWM which serves as the program, administered by DEP, with primary responsibility for implementing the state's NPS Management Plan. The 319 Program serves as the core initiative of the state for connecting the various program partners to each other in order to ensure effective NPS pollution abatement within Pennsylvania. Since 1990 Pennsylvania has received over $108 million from EPA to support nonpoint source pollution reduction activities within the commonwealth through the Section 319 NPS Management Program.

The 319 Program as administered in Pennsylvania focuses its limited funding resources on implementing BMPs specified in EPA approved Watershed Implementation Plans (WIPs), developed to identify needed BMPs to restore impaired priority waters. Pennsylvania currently has 35 approved WIPs on which Section 319 implementation funds are focused. These WIPs address uncontrolled urban stormwater runoff, agriculture runoff, abandoned mine drainage, and eroding streambanks. In addition to providing funding for WIP implementation, the 319 Program funds a limited number of statewide projects designed to support BMP implementation efforts such as education and training projects, BMP effectiveness assessment, and watershed monitoring.

Pennsylvania is responsible for reporting annually to EPA and the general public on the progress made by all program partners in achieving goals stated in the Nonpoint Source Management Plan. Through this annual reporting effort, the state documents the progress made in restoring the 35 priority watersheds. That annual reporting effort is also used as a tool to highlight activities performed by various partners which address nonpoint source pollution and which took place throughout the state, regardless of watershed.

The Bureau of Watershed Management supports NPS pollution abatement projects with funding through grants under Section 319(h) of the Clean Water Act. Since 1990, Pennsylvania has received over $106 million from EPA to support nonpoint source pollution reduction activities within the commonwealth through the Section 319 NPS Management Program. To accomplish the objectives of this plan, and to restore the waters of the commonwealth degraded by NPS pollution, the Section 319 program embedded within DEP's Bureau of Conservation and Restoration (BCR) focuses funding on projects associated with approved Watershed Implementation Plans. Further, through partnering and grant oversight, BCR engages conservation district Watershed Specialists who amplify funding, outreach, and restoration efforts through watershed association based liaison-activities. Further, BCR employs individuals with unique expertise in the fields of AMD restoration, resource conservation on agricultural operations, stream restoration, and urban stormwater management. Working collaboratively within and outside the department, the 319 Program coordinates restorative activities on precise watersheds throughout the commonwealth.

To learn more about the Section 319 program, go to:
http://www.depweb.state.pa.us/watershedmgmt/cwp/view.asp?a=1430&q=482303

2. Growing Greener Grants

The state Environmental Stewardship and Watershed Protection Act of 1999 authorizes DEP to allocate funding in the form of grants for AMD abatement, mine cleanup efforts, abandoned oil and gas well plugging, and local watershed-based conservation projects. Recently, an additional funding source has been added to this program, the state's Marcellus Legacy Fund established under the Oil and Gas Act (Act 13), 58 P.S. §§ 2301-3504. As of the 2013 state fiscal year, the Growing Greener program has provided over $235 million for the implementation of stream, lake and river restoration projects. Primarily, funding for the program comes from a tipping fee applied to waste hauled to landfills. These projects can include: watershed assessments and development of watershed restoration or protection plans; implementation of watershed restoration or protection projects, including stormwater management, wetlands, riparian buffer fencing and planting, stream bank restoration (especially fluvial geomorphology), and agricultural BMPs; construction of mine drainage remediation systems; reclamation of previously mine lands; and demonstration/education projects and outreach activities. These grants are available to a variety of eligible applicants, including counties, authorities, municipalities, county conservation districts, watershed organizations, and other organizations involved in the restoration and protection of Pennsylvania's environment. These grants will support local projects to clean up nonpoint sources of pollution throughout Pennsylvania focusing efforts in priority watersheds.

3. National Water Quality Initiative (NWQI)

The USDA National Resources Conservation Service and EPA are partnering in a program referred to as the National Water Quality Initiative (NWQI). This program focuses agricultural BMP implementation resources in select high priority watershed in states across the nation. Pennsylvania is participating in this program and currently has three watersheds identified for focused agriculture NPS remediation funding provided through this effort. As part of this effort, states are to undertake a water quality monitoring effort to determine water quality impacts resulting from this focused funding program. DEP has partnered with county conservation districts where these watersheds are located to provide an intense and long term monitoring program to track water quality impacts of this initiative.

4. Restoration Potential Indexing (RPI)

A new watershed prioritization protocol is currently being assessed in Pennsylvania. This new protocol is the Restoration Potential Indexing (RPI). The RPI was developed by EPA to provide states with a geographically based tool that can be used to identify and prioritize watersheds which will be most likely to respond to restoration efforts. Pennsylvania has begun the process of reviewing and testing the RPI. Further, Pennsylvania intends to determine if the RPI is more effective than conventional methods at prioritizing reassessment and TMDL development efforts.

5. Watershed Implementation Plans

Pennsylvania's NPS Management Program initiated the development of stream and lake watershed restoration plans in a number of watersheds throughout the state. These plans are commonly referred to as

Watershed Implementation Plans (WIPs) as the content and focus of the plans is the implementation of BMPs. These plans are designed to address specific elements, as directed by EPA Section 319 program guidance, including identification of pollution sources and loads, recommended BMPs, milestones for project implementation, and water quality recovery. WIPs are intended to serve as watershed management blueprints for use by local volunteer groups and municipal officials in designing and carrying out NPS pollution control projects with Section 319 grant funds. The NPS program provides technical support to local groups interested in preparing WIPs, with priority given to groups working actively in watersheds containing significant NPS water quality impairments and one or more TMDLs, where watershed assessments and/or previous restoration studies have been completed.

The NPS Management Program currently has 36 active EPA approved WIPs being implemented in the commonwealth. These WIPs represent priority watersheds for the NPS Program where EPA Section 319 Program implementation funds are focused. These WIP watersheds cover less than 5% of the land area of the state, indicating the strong targeting effort implemented by Pennsylvania for allocating the federal Section 319 implementation funds. Pennsylvania currently has several other WIPs being considered for development.

Completed WIPs for Pennsylvania's priority watersheds may be viewed at the following website: http://www.portal.state.pa.us/portal/server.pt?open=514&objID=554271&mode=2

6. PA State Water Plan

The Water Resources Planning Act (Act 220), signed into law on December 16, 2002, established a statewide Water Resources Committee and six Regional Water Resources Committees that collectively include 169 appointed members. The committees were charged with guiding DEP in the development of a new State Water Plan, to replace one developed between 1975 and 1983, and with approving and recommending approval to the Secretary. Act 220 stipulates that the plan be completed and adopted within five years of the effective date of the legislation and updated every five years thereafter.

In January 2009, DEP's Secretary signed the new State Water Plan document which replaced the outdated plan last completed in 1983. This plan seeks answers to the following questions: How much water do we have? How much water do we use? How much water do we need? As a functional planning tool, the updated water plan provides Pennsylvanians with a vision, goals, and recommendations for meeting the challenges of sustainable water use over a 15-year planning horizon. The plan consists of inventories of water availability, an assessment of current and future water use demands, assessments of resource management alternatives, and proposed methods of implementing recommended actions. It also analyzes problems and needs associated with specific water resource activities such as navigation, stormwater management, and flood control. The plan consists of several products:

- Data and Analyses. The water resources data and technical work are the backbone of the plan, which includes the identification of Critical Water Planning Areas. The results of the technical work of the plan will be made available to the public through an interactive website.

• Regional Atlas: A collection of maps, charts, and descriptions of regional water resource issues of Pennsylvania water resources is being developed with specific sections on each of six major watershed basins: Delaware, Upper/Middle Susquehanna, Lower Susquehanna, Ohio, Potomac, and Great Lakes Basins. An interactive version of the Regional Atlas is proposed for the Web.

• Policy and Analyses papers: These papers provide information on regional and statewide priorities related to water resources, action agendas to implement recommendations, topical papers on issues such as stormwater management, navigation, water conservation, and goals for the future in each region.

• A public information document "Shared Resource…Shared Responsibility," illustrating the importance of Pennsylvania's water planning efforts.

The State Water Plan and information contained in the plan can be found at the state water plan website: http://www.pawaterplan.dep.state.pa.us/statewaterplan/docroot/default.aspx

7. DCNR Rivers Conservation Program

DCNR's Pennsylvania Rivers Conservation Program is part of DCNR's Community Conservation Partnership Program. DCNR partnerships involve greenways, open spaces, community parks, rail trails, river corridors and watersheds, natural areas, indoor and outdoor recreation, and environmental education. Agency programs will be linked with efforts to conserve natural resources including necessary BMPs to ensure a complete river conservation plan. Assistance can take the form of grants, technical assistance, information exchange, and training.

Information on the Rivers Conservation Program can be found on the Web at: www.dcnr.state.pa.us/brc/rivers/riversconservation

8. Coastal Nonpoint Pollution Program (CZARA 6217)

The Coastal Zone Act Reauthorization Amendments of 1990 (CZARA), 16 USC §§ 1451-1466, established Section 6217 to protect coastal waters from NPS pollution. This program, administered jointly at the federal level by the National Oceanic and Atmospheric Administration (NOAA) and the EPA, is designed to help protect and restore coastal waters in coastal states and territories. CZARA requires states to provide for the implementation of management measures for categories of nonpoint sources of pollution within a Section 6217 management area with the goal of achieving water quality standards over time. Section 6217 management area consists of watersheds that drain to Pennsylvania's coastal waters – the Delaware Estuary and Lake Erie.

All states with federally approved coastal management programs are required to develop a Coastal Nonpoint Pollution Program (CNPP). DEP received federal approval from NOAA and EPA for its Program in June 2000, completing a major undertaking that began in 1992. Through cooperative staff efforts in the

Water Planning Office and the Bureau of Watershed Management, a realistic coastal nonpoint pollution program is being implemented.
Under the CNPP, Pennsylvania's priority management measures are being implemented to protect coastal waters from nonpoint source pollution resulting from urban runoff, agriculture, marinas and recreational boating, and hydromodification. These management measures are being accomplished through existing programs that address these kinds of nonpoint source pollution, and through projects funded by Coastal Nonpoint Pollution Program and Coastal Resources Management Program grants. In addition, the program is working to protect wetlands and riparian areas, and encourage use of vegetated treatment systems. These measures are to be implemented within federally approved Management Areas, which in Pennsylvania include watersheds draining to Lake Erie and the Delaware Estuary.

For more information, see website: http://www.dep.state.pa.us/river/grants/cnpp/cnpp.htm

9. PA Sea Grant Program

In March 1998, a Pennsylvania Sea Grant outreach program was established in the commonwealth. Pennsylvania's program is part of the National Sea Grant Network that was established in 1966 and has grown to include 30 Sea Grant colleges involving hundreds of universities nationwide. The mission of Pennsylvania Sea Grant is to promote wise stewardship of coastal resources, including ocean and Great Lake regions. The NOAA, within the U.S. Department of Commerce, administers the Sea Grant Program.

The goal of Pennsylvania Sea Grant is to increase public awareness of, and solutions to, environmental and economic coastal-related issues through extension, education, applied research, and communications outreach, thereby improving the overall environmental and economic health of the commonwealth's coastal regions.

Current activities include NPS pollution programming, with the addition of a Nonpoint Education for Municipal Employees (NEMO) program in the Lake Erie watershed.

For more information, refer to website: http://www.pserie.psu.edu/seagrant/seagindex.htm

10. Delaware Estuary Program

In 1988, the governors of Pennsylvania, New Jersey, and Delaware, signed a package nominating the Delaware Estuary to the National Estuary Program (NEP). The NEP was established by the 1987 amendments to the Federal Water Pollution Control Act, also referred to as the Water Quality Act of 1987 to promote long-term planning and management in nationally significant estuaries threatened by point source and NPS pollution, development, or overuse.

11. Great Lakes Initiative

Pennsylvania's 63 miles of coastline on Lake Erie provided PA with an opportunity for membership in the Great Lakes Basin community. In 1995, Governor Tom Ridge created the Office of the Great Lakes to

devote full-time attention to Great Lakes issues. Many water quality issues have challenged the management of and use of Lake Erie for many years. Among those issues are challenges associated with non-point source pollution. While land use surrounding Lake Erie varies greatly amongst the various jurisdictions, the Pennsylvania side of this great lake is characterized by predominantly urban and industrial land uses as found in Erie and Millcreek Townships. While Erie County is the county in PA with a direct connection to Lake Erie, management of this unique region is achieved through the cooperation of two nations, two provinces, eight states, and an uncounted number of local municipal governments.

Presque Isle Bay is one of Pennsylvania's many state parks. It is the only state park on Lake Erie and as such provides visitors with unique boating, fishing, and beach-going opportunities. Located in the northwest corner of Pennsylvania and on the southern shore of Lake Erie, Presque Isle Bay is a valuable Pennsylvania resource requiring protection from a legacy of non-point source pollution issues. The abatement of NPS pollution is a critical step in the restoration of beneficial uses in Presque Isle Bay.

12. Source Water Protection Programs

Contamination from non-point source pollution is now the primary cause of maximum contaminant level (MCL) violations and drinking water treatment problems for public water systems. Protecting sources of public drinking water and providing support for local source water protection programs are a priority for DEP and EPA alike. However, these objectives are not always consistent with present biological assessment of stream criteria. A stream may meet water quality standards but still pose a potential public health threat and a treatment problem for a public water system. The Source Water Assessment and Protection Program (SWAPP) was developed to prioritize and facilitate needed action to secure public drinking water quality and manage the risk of contamination.

Source water protection has been promoted through source water assessments conducted by DEP of all sources of public drinking water. The assessments rank the susceptibility of the raw public drinking water source to existing or potential sources of contamination in the assessment area. The source water assessments are required to be conducted under the Safe Drinking Water Act and can serve to direct or prioritize existing regulatory, technical support, and grant programs to needed areas for the protection of public health and safety. The primary purpose for the assessments is to promote and support development of local, voluntary source water protection programs for community water systems. Local voluntary source water protection programs are supported and encouraged through education, technical assistance, and financial assistance. Source water protection grants are available to communities and systems to finance development and initial implementation of local source water protection programs. The state's Wellhead Protection Program has formed the cornerstone of the Source Water Protection Program for groundwater sources serving community water systems.

For more information, refer to website:
http://www.dep.state.pa.us/dep/deputate/watermgt/wc/Subjects/SrceProt/SourceAssessment/default.htm

13. Groundwater Quality Protection Policy

Pennsylvania's Groundwater Protection Programs are summarized below. Funding sources include Section 106 grant funding and state monies. The protection of groundwater centers on Pennsylvania's Clean Streams Law 35 P.S. 691.1, et seq., which governs the protection and use of ground and surface water. In regard to groundwater, this law:

• Includes "underground water" (aka: groundwater) in the definition of "waters of the commonwealth";

• Defines pollution as "contamination of any waters of the commonwealth such as will create or is likely to create a nuisance or to render such waters harmful, detrimental or injurious to public health, safety, or welfare, or to domestic, municipal, commercial, industrial, agricultural, recreational or other legitimate beneficial uses , or to livestock , wild animals, birds, fish, or other aquatic life including but not limited to such contamination by alteration of the physical chemical or biological properties of such waters or change in temperature, taste, color or odor thereof or the discharge of any liquid gaseous radioactive solid or other substances into such waters";

• Declares that the discharge of sewage, industrial wastes, and other substances in a manner that causes or contributes to groundwater pollution is not a natural use of the groundwater, is against public policy, and constitutes a public nuisance;

• Provides for the regulation of any activity that poses the threat of pollution to groundwater;

• Provides for the protection of any source of water that may be used as a present or future supply to the public and prohibits the pollution of any such source in a manner that would be inimical or injurious to public health;

• Provides for the cessation of activities that cause or contribute to groundwater pollution;

• Sets forth obligations for the abatement of groundwater pollution. The Groundwater Protection Program is based on DEP's Principles for Groundwater Pollution Prevention and Remediation, 383-0800-001.

Pennsylvania has completed the Comprehensive State Groundwater Protection Program (CSGWPP) and Self-Assessment in accordance with EPA guidance. The CSGWPP provides a mechanism whereby Pennsylvania and EPA can work together to develop a comprehensive and consistent statewide approach to groundwater quality protection.

For more information, refer to website:
http://www.dep.state.pa.us/dep/deputate/watermgt/wc/Subjects/SrceProt/Ground/default.htm.

14. Citizen's Volunteer Monitoring Program

DEP's formal Citizen's Volunteer Monitoring Program has been discontinued due to a lack of funding available for this activity. Pennsylvania's NPS Program continues to work with various local and regional groups and watershed organizations that continue to provide volunteer monitoring efforts to assess their local and regional water bodies.

Almost by definition, the problems of NPS pollution require community based solutions. Involvement of individuals and organizations in monitoring water quality of streams, lakes, and rivers enables them to become active participants in watershed programs and activities. Volunteer monitoring creates an informed constituency that understands the power and limitations of scientific information and enables the volunteers to become effective stewards of local water resources and part of the solution to problems in their watersheds.

Current volunteer monitoring initiatives include working with Section 319 program staff and volunteers to monitor certain stream segments to assess the impact of stream restoration projects supported by Section 319 program funds. Citizen volunteers also engage in monitoring at locations associated with CREP practices to assess the effectiveness of these practices. Additional volunteer monitoring initiatives include watershed monitoring for stream delisting, healthy waters initiative, and riparian forested buffer monitoring. By working with citizens and partnering with DEP programs, the hope is to integrate more volunteers into projects like screening for stream delisting, restoration monitoring, and riparian buffer monitoring as well as other monitoring ventures in order to meet both volunteer and DEP needs.

15. National Monitoring Program in Pennsylvania

Monitoring of both land treatment and water quality is the best way to document the effectiveness of NPS pollution control efforts. The purpose of the EPA's Section 319 National Monitoring Program is to provide credible documentation on the feasibility of controlling nonpoint sources of pollution and to improve the technical understanding of NPS pollution and the effectiveness of NPS control technology and approaches. There are only 24 national monitoring sites. Pennsylvania's Section 319 Program has made a substantial commitment to and provided funding for four national monitoring sites, including the only national monitoring site for AMD. The four sites located in Pennsylvania are:

- Pequea/Mill Creek Watershed in an agricultural setting;
- Stroud Water Research in a riparian reforestation area;
- Swatara Creek Watershed in an area impacted by AMD; and
- The Villanova Urban Stormwater Partnership (VUSP) to evaluate urban BMPs.

16. Great Lakes Basin Program for Soil Erosion and Sediment Control

The Great Lakes Basin Program for Soil Erosion and Sediment Control was authorized in the 2002 Farm Bill and sustains a federal/state partnership that has supported well over 200 demonstration, education, and technical assistance projects throughout the Great Lakes region. The Basin Program is coordinated by the

Great Lakes Commission in partnership with the USDA-NRCS, EPA, and the USACOE. Local match is at least 25% of the total project cost. As of 2014, the Great Lakes Basin Program has supported six soil erosion and sediment control projects in Pennsylvania totaling $78,100, with an additional $91,300 being leveraged from non-federal sources.

Projects in Pennsylvania have demonstrated or provided information regarding several innovative techniques to reduce streambank, urban and agricultural erosion and sedimentation. These projects will directly prevent the loss of over 2,257 tons of soil. Further, throughout their lifespan, implementation of these projects will result in the reduction of nine tons of nitrogen and 12 tons of phosphorus.

For more information, refer to Website: http://www.glc.org/basin/.

17. Chesapeake Bay Program

Pennsylvania's portion of the Chesapeake Bay watershed includes the Susquehanna and Potomac River watersheds, covering approximately half the land area in the commonwealth. Pennsylvania has been a leader in adopting award-winning programs to improve the quality of water reaching the Chesapeake Bay and in working with key partners, like county conservation districts, to achieve pollution reduction goals for the Chesapeake Bay.

In 2012, Pennsylvania finalized the Phase II Chesapeake Watershed Implementation Plan (CB WIP), which is a catalog of activities and measures that, if applied to Pennsylvania's Susquehanna and Potomac Watersheds, generate appreciable nutrient or sediment reductions in order to provide cleaner water resources in the commonwealth and help restore the water quality downstream in the Chesapeake Bay. DEP continues to work with stakeholders to pursue funding and develop methodologies that will result in project implementation that will help meet the goals of the CB WIP. The goals of the CB WIP are further refined with the development of two-year milestones. Two-year milestones are short-term objectives under the Chesapeake Bay TMDL accountability framework used to assess progress toward water quality restoration goals. EPA oversees and directs states' efforts to update their WIPs to meet water quality restoration goals.

The Chesapeake Bay TMDL has resulted in the development of localized and statewide WIPs outlining planned activities of the state to meet the calculated TMDL reduction goals. The reporting process under the Chesapeake Bay Program requires states to report on their progress every two years in meeting the biennial implementation milestones outlined in the WIPs. Pennsylvania has committed to providing this two year Chesapeake Bay WIP milestone reporting as administered under the Chesapeake Bay Program. The NPS Management Plan is developed to be fully consistent with and supportive of the efforts of the state to meet its Chesapeake Bay TMDL goals and WIP milestones.

The Chesapeake Bay Program partnership is active in its efforts to assist and direct Chesapeake Bay watershed states, including Pennsylvania, to assess BMP implementation activities within the watershed and to monitor progress in addressing the goals in Pennsylvania's CB WIP. This effort is to promote increased implementation and the incorporation of more accurate BMP data into planned updates of the

Chesapeake Bay Program partnership model. The BMP implementation activities to be tracked under this effort include those that are funded using public funds and those that are implemented without any financial or technical assistance. This is proving to be a significant effort of the state and supports the efforts of the NPS Program to monitor progress in meeting the various EPA approved Clean Water Act Section 319 WIPs in our 35 priority watersheds throughout the state.

Pennsylvania, through a collaborative effort between DEP and the CDs, will continue to engage 100 farmers per county in Pennsylvania's portion of the Chesapeake Bay watershed with the intent of providing education and outreach to farm operators to achieve compliance with existing state and federal regulations regarding erosion control and nutrient management. These 100 visits are separate from other CAFO inspections or inspections conducted for other purposes and will simply serve as an education and outreach effort, not as a compliance and enforcement effort. Additional goals specific to the Chesapeake Bay Watershed can be found in Pennsylvania's Chesapeake Bay Program WIPs and two-year milestones established under the Bay Program.

For more information, refer to website:
http://www.depweb.state.pa.us/chesapeake/cwp/view.asp?a=3&Q=442886&chesapeakeNav=|29958|.

18. Nutrient Trading

Nutrient credit trading is an approach to improving water quality that utilizes market mechanisms to produce pollutant reductions at lower costs. The primary purpose of the Nutrient Credit Trading Program is to provide more efficient options for certain regulated entities to satisfy specific regulatory or permit-oriented requirements. The voluntary trading program provides an opportunity for certain regulated entities to earn credits by exceeding environmental obligations. Credits earned may be sold to other regulated entities who find the purchase of these credits to be a more effective means of satisfying regulatory obligations.

On October 9, 2010, DEP published its nutrient trading regulation, 25 Pa. Code § 96.8, entitled "Use of offsets and tradable credits from pollution reduction activities in the Chesapeake Bay Watershed," in the Pennsylvania Bulletin. See, 40 PA. B. 5790. The regulation became effective that day. The regulation codifies, the program requirements for participation in the Nutrient Tracking Program, including the process for the certification, whereabouts, & registration of Nutrient Sediment.

As this NPS Management Plan is being drafted, Pennsylvania is in the process of evaluating the Nutrient Credit Trading Program. During the lifespan of this Management Plan, changes to this program will be finalized and incorporated into revisions to the program regulations as appropriate.

For more information, refer to website:

http://www.depweb.state.pa.us/nutrienttrading

19. Commonwealth Financing Authority (CFA) – Act 13 Projects

The Commonwealth Financing Authority (CFA) was established as an independent agency of the commonwealth to administer Pennsylvania's economic stimulus packages. The CFA holds fiduciary responsibility over the funding of programs and investments in Pennsylvania's economic growth.

Act 13 of 2012 established the Marcellus Legacy Fund and allocates funds to the CFA for the Abandoned Mine Drainage Abatement and Treatment Program (AMDATP), as well as the Watershed Restoration and Protection Program (WRPP). These two programs began in 2013 and serve as a significant funding source for the implementation of projects to protect and restore threatened and impaired waters within Pennsylvania.

During the first two years of the program, the AMDATP provided over $7.0 million to 16 projects to abate the impacts of abandoned mine drainage within the commonwealth. Also during this two year timeframe, over $6.9 million was award to 45 projects under the WRPP to address agricultural and urban stormwater issues degrading streams within Pennsylvania.

For more information, refer to website:
http://www.newpa.com/find-and-apply-for-funding/commonwealth-financing-authority

20. Regional Conservation Partnership Program (RCPP)

The Regional Conservation Partnership Program (RCPP), initiated in 2014, promotes coordination between NRCS and its partners to deliver conservation assistance to producers and landowners. NRCS provides assistance to producers through partnership agreements and through program contracts or easement agreements.

RCPP combines the authorities of four former conservation programs – the Agricultural Water Enhancement Program, the Chesapeake Bay Watershed Program, the Cooperative Conservation Partnership Initiative and the Great Lakes Basin Program. Assistance is delivered in accordance with the rules of applicable NRCS programs.

RCPP encourages partners to join in efforts with producers to increase the restoration and sustainable use of soil, water, wildlife, and related natural resources on regional or watershed scales. Through RCPP, NRCS and its partners help producers install and maintain conservation practices in selected project areas. Partners leverage RCPP funding in project areas and report on the benefits achieved.

The RCPP provides significant resources for farmers to address manure management and erosion control efforts on their farms. The program has a defined interest in efforts to support the restoration of the Chesapeake Bay and, at the time of the development of this plan, is still determining additional project areas within the state.

For more information, refer to website:
http://www.nrcs.usda.gov/wps/portal/nrcs/main/national/programs/farmbill/rcpp/

21. PACD Technical Assistance Grant (TAG)

Since 2001, the Pennsylvania Association of Conservation Districts' (PACD) Engineering Assistance Program has provided statewide engineering and soils technical assistance to entities developing or implementing a watershed assessment, watershed restoration plan, or watershed protection plan.

The PACD staff providing this assistance are regionally based, but cover all river basins in Pennsylvania. Staff are professional engineers and conservation technicians who can identify problems, scope solutions, identify engineering needs, estimate costs and realistic time frames, and identify assistance needed to implement solutions. They are also able to assist future Section 319 and Growing Greener grant applicants in the development of sound applications.

Through this program, funded by Pennsylvania's Growing Greener Program and the USDA NRCS, the Pennsylvania Association of Conservation Districts technical staff completed over 185 projects over the time period of April 2012 through August of 2013. These projects implemented approximately $7.1 million of environmental improvements throughout the commonwealth.

To learn more about the PACD TAG Program, go to:
http://pacd.org/about1/engineering-assistance-program/

22. Targeted Watershed Initiative

Beginning in 2014, DEP began implementation of a new agricultural assessment and assistance initiative to be carried out on six different agriculturally impaired watersheds annually. The six watersheds selected annually are impaired due to agricultural sources and of a relevant size allowing all agricultural operations to be assessed within a 12 month timeframe. Each of the working farms in these watersheds will be visited by staff from the respective DEP regional office. DEP will first work with the owner/operator to achieve voluntary compliance with its regulatory requirements.

Working with a local conservation district, DEP will make available technical and financial support to assist farming operations to correct any significant problems having an impact on water quality and in achieving regulatory compliance. These grants will support development of required plans and implementation of BMPs necessary to implement these plans and to address water quality problems.

23. PENNVEST Nonpoint Source Program

The Pennsylvania Infrastructure Investment Authority (PENNVEST) provides low interest loans and grants for nonpoint source agriculture, abandoned mine drainage, and urban stormwater projects throughout the commonwealth. From the timeframe of July 2010 through October 2013, PENNVEST has invested more than $30 million in loans and $27 million in grants to support the implementation of nonpoint source projects and BMPs on agricultural operations and urban stormwater sites.

For more information on the PENNVEST nonpoint source program, go to:
http://www.portal.state.pa.us/portal/server.pt/community/programs/9322/non-point_source_projects/541851

24. TreeVitalize

Responding to an alarming trend of the loss of trees in Pennsylvania's metropolitan areas, TreeVitalize is a public-private partnership to help restore tree cover, educate citizens about planting trees as an act of caring for our environment, and build capacity among local governments to understand, protect and restore their urban trees. Launched in 2004 in southeastern Pennsylvania, TreeVitalize has planted over 350,000 trees through the help of many partners and interested community volunteers. Starting in the spring of 2013, TreeVitalize became available to all counties within Pennsylvania.

For more information on the TreeVitalize program, go to:
http://treevitalize.net/

25. WPCAMR Quick Response Program

The Quick Response Program provides funding for emergency repairs for Growing Greener eligible water restoration projects which includes passive treatment systems. This program allows for a quick consideration and approval of grant funding requests to implement repairs of systems that have a high potential to harm local water quality if not addressed quickly.

For more information on the WPCAMR Quick Response program, go to:
http://www.wpcamr.org/projects/QuickResponse/index.html

26. PACD NPS Education Program

The Pennsylvania Association of Conservation Districts, Inc. (PACD) administers the Pennsylvania NPS Education Office and performs various activities designed to enhance and support county conservation district NPS pollution educational efforts as well as §319 and DEP watershed priorities. This program provides the NPS education mini-grant program, development and maintenance of the PA NPS education website, and support for various workshops and trainings.

27. PA League of Women Voters, WREN

The Pennsylvania Water Resources Education Network (WREN) is a nonpartisan informal collaboration among organizations and public officials working for the protection and management of Pennsylvania's water resources, both surface and ground water, through education and informed policy making.

The goals of this organization are:

- To foster and support local stakeholder communities who will educate themselves, other citizens, and local officials about their water resources and the public policies necessary to protect them;
- To make water resources protection a priority at the state and local level in Pennsylvania;
- To facilitate water resources education in schools;

- To exchange information among WREN members about activities and information relating to water resources in Pennsylvania;
- To enhance coordination and cooperation between WREN members; and
- To make recommendations about meeting water resources education needs in schools and communities;

This program provides an NPS education mini-grant program focused on working with local governments to encourage their efforts to implement NPS projects and maintaining a website of various NPS education materials developed through the mini-grant program.

For more information on WREN, go to: http://wren.palwv.org/intro.html

28. Oil and Gas Well Plugging

Oil well drilling began in Pennsylvania in 1859. In 1956, Pennsylvania began permitting new drilling operations and starting in 1985, oil and gas operators were required to register old wells. In the years prior to 1985 many wells were not properly plugged when abandoned.

The Oil and Gas Act of 1984 required oil and gas well operators to plug non-producing wells. The Well Plugging Program has been established to plug abandoned and orphan wells where no responsible party has been identified.

In 1992, the legislature amended the Oil and Gas Act of 1984 to allow certain oil and gas wells abandoned before April 1985 to be classified as orphan wells. This amendment gave DEP the authority to plug orphan wells.

Surcharges were established by the Oil and Gas Act to fund the orphan and abandoned Well Plugging Program. The 2012 Oil and Gas Act, Section 3271, continued the provision for surcharges. Well plugging contracts are funded with permit surcharges which are in addition to the permit application fee. The orphan surcharge is $200 for a gas well or $100 for an oil well. The abandoned well surcharge is $50.

29. Environmental Quality Incentives Program (EQIP)

EQIP, administered by USDA Natural Resources Conservation Service, provides financial and technical assistance to agricultural producers in order to address natural resource concerns and deliver environmental benefits such as improved water and air quality, conserved ground and surface water, reduced soil erosion and sedimentation or improved or created wildlife habitat.

Eligible program participants receive financial and technical assistance to implement conservation practices, or activities like conservation planning, that address natural resource concerns on their land. Payments are made to participants after conservation practices and activities identified in an EQIP plan of operations are implemented. Contracts can last up to ten years in duration. In federal fiscal year 2013, EQIP

provided $21.1 million to Pennsylvania farmers for the implementation of EQIP eligible conservation practices.

Agricultural producers and owners of non-industrial private forestland are eligible to apply for EQIP. Eligible land includes cropland, pastureland, non-industrial private forestland and other farm lands.

For more information on EQIP, go to:
http://www.nrcs.usda.gov/wps/portal/nrcs/main/national/programs/financial/eqip/

30. Conservation Reserve Enhancement Program (CREP)

The Conservation Reserve Enhancement Program (CREP) is an offshoot of the Conservation Reserve Program (CRP), the country's largest private-land conservation program. Administered by the Farm Service Agency (FSA), CREP targets high-priority conservation issues identified by local and state governments or non-governmental organizations. In exchange for removing environmentally sensitive land from production and introducing conservation practices, farmers and agricultural land owners are paid an annual rental rate. Participation is voluntary, and the contract period is typically 10–15 years, along with other federal and state incentives as applicable per each CREP agreement. CREP is available statewide in Pennsylvania except for a seven county region in the Delaware River watershed. These remaining seven counties are proposed to be brought into the CREP program in the near future.

As of September of 2013, over 11,285 CREP contracts have been put into place covering approximately 166,000 acres in Pennsylvania, with FSA providing over $56 million and the commonwealth of Pennsylvania providing over $32 million in cost share payments.

For more information on CREP, go to:
http://creppa.org/

31. Integrated Pest Management Program (IPM)

Pennsylvania's Integrated Pest Management (IPM) program focuses on effective pest management in a manner that is profitable, safe and environmentally compatible. PDA is required by the Pesticide Control Act, 3 P.S. §§ 111.21-111.61, to educate all pesticide applicators about IPM control methods as a part of license recertification requirements.

In addition, Pennsylvania is a signatory party to the Chesapeake Bay Resolution, which encourages the promotion of Integrated Pest Management (IPM) practices to citizens as a method to reduce toxics in the Bay. The PDA initiates efforts to coordinate both IPM and Sustainable Agriculture activities between the PDA and Penn State University. Since many pest control practices also have sustainable agricultural value and vice versa, combining the programs helps further on both of these efforts having like goals. This collaborative effort is known as the Pennsylvania IPM Program (PA IPM).

For more information on Pennsylvania's IPM program, go to:
http://www.agriculture.state.pa.us/portal/server.pt/gateway/PTARGS_0_2_24476_10297_0_43/AgWebsite/ProgramDetail.aspx?palid=111&

32. PA Dirt, Gravel and Low Volume Roads Maintenance Program

Pennsylvania has more than 25,000 miles of unpaved roads, about 17,500 of which are owned by local municipalities and provide access for the states' agriculture, mining, forestry, and tourism industries as well as more than 3.6 million residents. Nonpoint source pollution is responsible for 88 percent of all impaired stream miles in Pennsylvania. Dirt, gravel and low volume roads have historically been significant contributors of nonpoint source pollution, both in terms of sediment and dust.

Section 9106 of the Pennsylvania Motor Vehicle Code, 75 Pa.C.S. § 9106, established the Dirt, Gravel and Low Volume Road Maintenance Program, which is based on the principle that informed and empowered local control is the most effective way to stop pollution from dirt, gravel, and low volume roads. The law created a dedicated, non-lapsing fund to provide money and training to local communities for local road maintenance. The funds are distributed by the State Conservation Commission (SCC) to 65 county conservation districts in Pennsylvania (out of 67 counties) that participate in the Program.

Section 9106 of the Pennsylvania Motor Vehicle Code annually provides for the allocation of $35,000,000 from the Motor Vehicle License Fund for the Dirt, Gravel and Low Volume Road Maintenance Program. Of that amount, $7,000,000 is allocated directly to the Bureau of Forestry for maintaining the dirt, gravel, and low volume roads in their jurisdictions. The SCC is responsible for allocating the remaining $28,000,000 to the 65 County Conservation Districts who participate in the Dirt, Gravel and Low Volume Road Maintenance Program, including up to $8,000,000 for the maintenance of low-volume paved roads. The fund is administered as a non-lapsing, nontransferable account restricted to maintenance and improvement of dirt, gravel & low volume roads.

Created in 2001, the Center for Dirt and Gravel Road Studies is contracted by the SCC to provide services to the program. Located on Penn State's University Park Campus, this center provides technical assistance and training to participating entities. Through this program, over 16,500 miles of unpaved roads have been mapped and inspected, and over 16,600 worksites have been identified and mapped where road runoff negatively impacts a stream.

For more information on Pennsylvania's Dirt, Gravel and Low Volume Road Maintenance program, go to: http://www.agriculture.state.pa.us/portal/server.pt/gateway/PTARGS_0_2_24476_10297_0_43/AgWebsite/ProgramDetail.aspx?palid=25&

33. PA Stream Relief

DEP maintains the Stream ReLeaf Database which is used to collect written or electronic submissions of buffer projects established by various agencies and groups. The tracking of those submissions began in 2003 in the Chesapeake Bay Watershed and has now expanded statewide. The vast majority of the projects being tracked by the database has been funded by a number of sources: Alliance for the Chesapeake Bay, Chesapeake Bay Foundation, Conservation Reserve Enhancement Program (CREP), Fish and Boat Commission, Growing Greener, The Section 319 Program, Watershed Restoration Assistance Program, and

The William Penn Foundation. This database provides DEP's primary method for determining the extent of stream side buffers established in the commonwealth.

For more information on Pennsylvania's Stream Relief initiative, go to:
http://www.ahs.dep.pa.gov/streamreleaf/

34. PA Wellhead Protection Program

As required under the federal Safe Drinking Water Act, the commonwealth of Pennsylvania, through the Bureau of Water Supply Management of DEP, has developed a Wellhead Protection Program to protect ground-water sources used by public water systems from contamination that may have an adverse effect on public health. Participation in the program is voluntary and builds upon the basic requirements for water purveyors to obtain the best available source and to take the appropriate actions to protect the source, thereby ensuring a continual and safe water supply. The Wellhead Protection Program will suffice for the ground-water component of the Source Water Assessment Program which is also required to be developed under the Safe Drinking Water Act. The responsibility for wellhead protection in Pennsylvania is shared between the state, local governments, and water suppliers.

The focal point of a local wellhead protection program is the wellhead protection area delineation as depicted on a map. The Pennsylvania Safe Drinking Water Regulations define a three-tiered wellhead protection area. Zone I is the innermost protective zone which ranges from a 100 to 400 feet radius depending on source and aquifer characteristics. Zone II is the capture zone that by default is a ½ mile radius around the source unless a rigorous hydrogeologic delineation is performed. Zone III is the area beyond Zone II that contributes recharge to the aquifer within the capture zone.

The Bureau of Water Supply Management has provided technical, educational and financial assistance to promote the development and implementation of local wellhead protection programs. The Bureau has supported rigorous delineation of Zones II and III through past grant projects and has delineated these zones in cooperation with the Pennsylvania Rural Water Association's wellhead protection assistance activities. Various incentive grants to seed local wellhead protection development have been offered by DEP. Since 1993, 16 counties have been funded under the County Water Supply Planning/Wellhead Protection Grant Program to develop county-wide water supply planning in conjunction with pilot wellhead protection activities. Outreach efforts including formal presentations, regional roundtables with water suppliers and co-promotional events with other organizations involved with ground-water protection will continue, especially as wellhead protection is integrated with the Source Water Assessment Program.

For more information on Pennsylvania's Wellhead Protection Program, go to:
http://www.dep.state.pa.us/dep/deputate/watermgt/wc/Subjects/SrceProt/source/Final_WHPP.htm

35. Act 537 Sewage Facilities Program

On January 24, 1966, the Pennsylvania Sewage Facilities Act, (Act 537), 35 P.S. §§ 750.1-750.20a, was enacted to correct existing sewage disposal problems and prevent future problems. To meet this objective, the Act requires proper planning in all types of sewage disposal situations. Local municipalities are largely responsible for administering the Act 537 sewage facilities program. To assist local municipalities in fulfilling this responsibility, DEP provides technical assistance, financial assistance, and oversight.

Municipalities are required to develop and implement comprehensive plans that provide for the resolution of existing sewage disposal problems, provide for the future sewage disposal needs of new land development, and provide for future sewage disposal needs of the municipality. This plan is sometimes called the "base" plan or the "Act 537 plan." When a new land development project is proposed, municipalities are required to revise their official plan, unless the project is exempt from planning.

For more information on Pennsylvania's 537 Sewage Facilities Program, go to:
http://www.dep.state.pa.us/dep/deputate/watermgt/wqp/Forms/Act537/Forms_537Plan.htm

36. SMCRA Grants

Section 18(j) of the Surface Mining Conservation and Reclamation Act (PA SMCRA), 52 P.S. §§ 1396.1-1396.19b allows DEP to award grants to municipalities, municipal authorities, and appropriate incorporated nonprofit organizations from the SMCRA Fund. This includes SMCRA Bond Forfeiture and AMD Set-Aside grants. Annually, these programs provide several million dollars to support the efforts of DEP's local partners to reduce and eliminate abandoned mine drainage impacts on the waters of the commonwealth.

37. PA DEP Abandoned Mine Lands Program

The Bureau of Abandoned Mine Reclamation (BAMR) administers and oversees the Abandoned Mine Reclamation Program in Pennsylvania. The bureau is responsible for resolving abandoned mine land (AML) problems such as mine fires, mine subsidence, dangerous highwalls, open shafts and portals, mining impacted water supplies and other hazards which have resulted from past coal mining practices in accordance with requirements established by the federal Office of Surface Mining (OSM) under authority of the Surface Mining Control and Reclamation Act, 30 USC §§ 1201-1328 (SMCRA).

AML funding is provided to Pennsylvania through grants from OSM. SMCRA requires that active coal operators pay an AML fee on each ton of coal mined. OSM collects the fee and distributes it through annual grants to the AML states and tribes according to a distribution formula established in the law. In 2013, Pennsylvania received an AML grant award of $58.5 million. Collection of the AML fee is currently authorized by SMCRA through federal fiscal year 2021. Provided Congress does not alter the law, Pennsylvania will receive future AML grants through 2022. Based on current levels of active coal mining, AML grants to Pennsylvania over the next few years are projected in the range of $50 to $60 million dollars.

To learn more about Pennsylvania's AML Program, go to:
http://www.portal.state.pa.us/portal/server.pt/community/aml_program_information/21360

38. Bureau of Conservation and Restoration AMD Program

The Bureau of Conservation and Restoration, Division of Watershed Restoration, administers the AMD Set-Aside Program in Pennsylvania. This program receives funding from the OSM, also under the authority of SMCRA, to abate and treat AMD in Qualified Hydrologic Units. Up to 30% of PA's AML grant can be deposited in the Set-Aside fund. The program develops, designs and constructs active and passive treatment

systems, as well as AMD abatement projects. In addition, the program provides up to $2 million per year in grants, through the Growing Greener Plus program, for watershed groups and others to complete projects in qualifying watersheds. The fund is also used to provide for long-term operation and maintenance of active and passive treatment facilities. In order to continue to operate and maintain treatment systems, there is an O&M subaccount within the fund that will allow for continued operation beyond the current AML grant period that ends in 2022.

39. Trout Unlimited AMD Technical Assistance

PA Trout Unlimited (TU) administers an Abandoned Mine Drainage (AMD) Technical Assistance Program. With this program TU has provided free assistance to watershed groups, TU chapters, county conservation districts, and others with a variety of AMD projects. With the help of these technical assistance staff, watershed organizations have successfully obtained grants from Growing Greener and/or other funding sources to move forward with full-scale AMD watershed assessments or implementation of AMD remediation projects. This initiative is a key element of Pennsylvania's efforts to restore commonwealth streams and watersheds from one of the largest sources of pollution to the state's waterways.

The types of free technical assistance being offered include the following:

- Rapid characterization of mine drainage;
- Rapid watershed snapshot;
- Conceptual design of AMD treatment systems;
- Existing treatment system evaluation and recommendations;
- Construction oversight;
- Pre- and/or post-construction biological and/or habitat surveys;
- Qualified Hydrologic Unit Plan (QHUP) development;
- Technical capacity building; and
- Other, as treated on a case-by-case basis.

To learn more about PA Trout Unlimited's AMD Technical Assistance Program, go to:
http://www.wbsrc.org/tutag.html

40. Source Water Assessment and Protection Program (SWAPP)

DEP conducts assessments of the susceptibility of public water system water sources to potential sources of contamination. These assessments have been done in accordance with Pennsylvania's Source Water Assessment and Protection Program and the Safe Drinking Water Act. The previously existing Wellhead Protection Program is considered the cornerstone for the assessment of ground water sources serving public water systems. The purpose for conducting the assessments is to educate the public and promote the development of local, voluntary source water protection. DEP offers a variety of support for municipalities, water suppliers, and the public to develop these local source water protection programs.

To learn more about Pennsylvania's SWAPP, go to:
http://www.dep.state.pa.us/dep/deputate/watermgt/wc/Subjects/SrceProt/SourceAssessment/default.htm

41. Master Watershed Steward Program

Pennsylvania's first Master Watershed Steward Program was piloted in the Lehigh and Northampton Counties in 2013 as a collaborative effort between Penn State Extension, the Watershed Coalition of the Lehigh Valley, the Northampton County Conservation District, the Pennsylvania Environmental Council, the Appalachian Mountain Club, the Nurture Nature Center, and the Wildlands Conservancy.

These programs, modeled after the volunteer Master Gardener program, train citizens in a formal way about the basics of watershed resource stewardship and create an energized, educated group of citizens with structured volunteer opportunities available to them to educate the community about water resources.

The participants in the Master Watershed Steward Program receive 40 hours of training on numerous topics, including water quality, stream health, native plants, recreational resources, and groundwater. Once they complete the training program, to become a certified Master Watershed Steward, these trainees fulfill 50 hours of volunteer service. In subsequent years, they can maintain their Master Watershed Steward status by giving at least 20 additional volunteer hours and attending at least eight hours of update training annually.

This pilot program has been successful and is expected to be expanded to another seven counties with the potential to become a statewide program during the five year life of this Plan.

For more information on Pennsylvania's expanding Master Watershed Steward Program, go to: http://extension.psu.edu/natural-resources/water/watershed-education/watershed-stewards

42. USFS Watershed Condition Framework

Since before 2011, the USFS has been developing a methodology to identify and prioritize 12-HUC watersheds located within USFS owned lands where nonpoint source pollution concerns are significant. Most of those lands are located in the western half of the United States and their health is directly connected to potable water supply. This framework follows seven steps. As part of this program, the USFS developed an on-line interactive mapping website (see Figure 5 below) which provides the public with information regarding the health of watersheds on USFS lands, their condition, and a number of other factors. Within Pennsylvania, the USFS has selected two "Functioning at Risk" watersheds as priority watersheds within the ANF. Those watersheds are the Sugar Run watershed and the Bear Creek watershed. As priority watersheds, these areas have Watershed Restoration Action Plans (WRAPs) completed or in the process of being completed. Further, the USFS makes a conscious effort to partner with local and state organizations (NGOs, conservation districts and state agencies) to implement priority projects per the WRAPs with the intent of restoring these priority watersheds.

For more information on the USFS's Watershed Restoration Program, go to:
http://www.fs.fed.us/restoration/Watershed_Restoration/overview.shtml

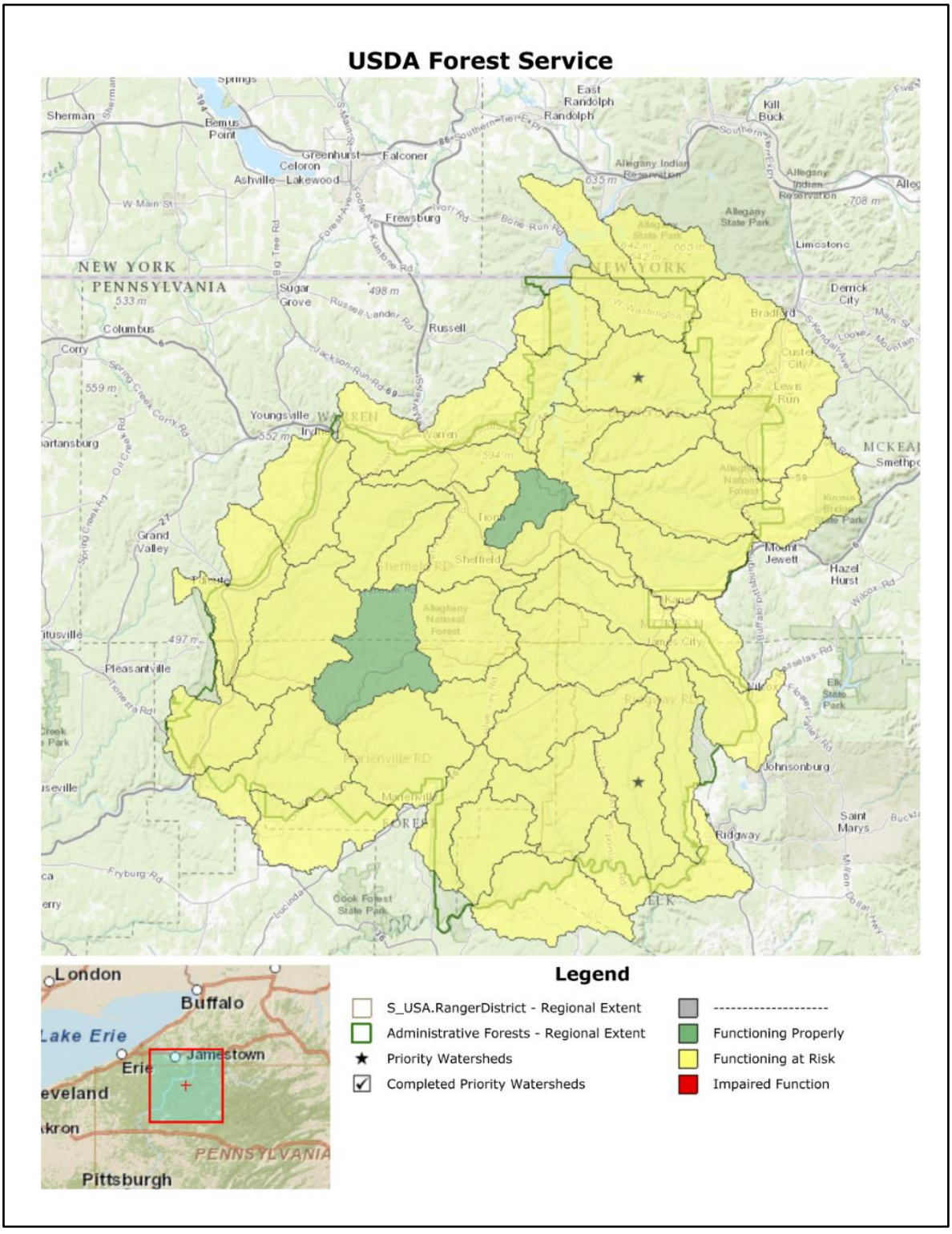

Figure 5: Map generated from the USFS website regarding the Watershed Condition Framework program. Areas in yellow are watersheds assessed by this program and determined to be overall "Fair" in condition. Areas in green are watersheds assessed by this program and determined to be overall "Good" in condition.

D. Regulatory Programs

Many of Pennsylvania's nonpoint source regulatory programs that protect water quality are implemented under the authority of its Clean Streams Law, originally passed in 1937, 35 P.S. §§ 691.1-691.1001, to "preserve and improve the purity of the waters of the commonwealth for the protection of public health, animal and aquatic life, and for industrial consumption, and recreation…". In addition, other statutes provide additional authority to regulate specific activities as discussed below. Many of Pennsylvania's environmental regulations impacting water quality originate under the Clean Streams Law and these various statutes. Nonpoint source programs administered through regulatory programs established under Title 25 of the Pennsylvania Code and discussed in more detail below include: Water Quality Standards/TMDLs, Erosion and Sediment Control, Agricultural Nutrient Management, Agricultural Animal Operations/Manure Management, Waterways and Wetlands Management, Stormwater Management, On-Lot Sewage Systems.

To access Pennsylvania's Clean Streams Law, refer to website: http://www.elibrary.dep.state.pa.us/dsweb/View/Collection-8703.

1. Water Quality Standards/TMDLs

Pennsylvania has adopted water quality standards as required by Section 303 of the Clean Water Act to protect designated and existing used of the waters of the commonwealth. Those standards are set forth in Chapter 93 of Title 25 of the Pennsylvania Code. DEP implements a statewide water quality monitoring program to assess the quality of the waters of the commonwealth. As required by Section 303(d) of the Clean Water Act, DEP identifies waters of the commonwealth that are impaired as a result of pollution. DEP also develops Total Maximum Daily Limits (TMDLs), commonly referred to as pollution diets, for impaired waters. In essence, TMDLs are a watershed based pollution budget, representing the total amount of pollutants that can be assimilated by a stream without causing water quality standards to be exceeded.

The commonwealth worked under a Memorandum of Understanding (MOU) with EPA Region 3 that required TMDL development for all waters on the 1996 Section 303(d) list for AMD-impacted streams. The obligations of that MOU were satisfied prior to the drafting of this Management Plan Update.

Impaired streams requiring TMDL development will be prioritized for future TMDL development. Preparation of watershed restoration plans will be coordinated with TMDL development where possible to ensure implementation funds, including Section 319 grant money, will be targeted to watersheds most in need of restoration and where local support and interest and existing water quality projects can enhance restoration efforts.

See the following website for more information: www.dep.state.pa.us/watermanagement_apps/tmdl/

2. Erosion and Sedimentation Pollution Control Program

The commonwealth has a well-established and nationally-recognized Erosion and Sedimentation (E&S) Pollution Control Program. Pennsylvania's E&S Program is administered by DEP and county conservation districts coordinated through a delegation of DEP's authorities to county conservation districts. Joint responsibilities for program implementation include the processing and issuance of permits, complaint investigations, site inspections, compliance, and enforcement. BMPs are reviewed for design and performance effectiveness through permit plan reviews and periodic site inspections at the construction site.

Standards and criteria for minimizing erosion and preventing sediment pollution are contained within DEP's Chapter 102 rules and regulations as authorized under Pennsylvania's Clean Streams Law. These regulations apply to any earth disturbance activity, including agricultural plowing and tilling, land development and road, highway, and bridge construction. Chapter 102 requires that an E&S plan be developed and implemented for earth disturbance activities. Each plan must specify the control measures and facilities (BMPs) that will be used to minimize erosion and prevent sediment pollution from the earth disturbance activity. The NPDES permit program for stormwater discharges associated with construction activities integrates the commonwealth's erosion control requirements.

Both DEP and county conservation districts facilitate implementation of BMPs by conducting numerous training seminars and workshops for persons, municipalities, and other parties engaged in undertaking earth disturbance activities. DEP provides direct support, training, and financial assistance to county conservation districts to maintain their proficiency and program involvement.

DEP, in conjunction with the delegated conservation districts, have initiated a focused outreach and education program to ensure all farmers within the state understand their planning and BMP implementation under the commonwealth's Erosion and Sedimentation Control Law.

For more information on Pennsylvania's Erosion and Sedimentation Control Program, refer to website: http://www.portal.state.pa.us/portal/server.pt?open=514&objID=554281&mode=2.

3. Agricultural Nutrient Management

Pennsylvania's first nutrient management law became effective in 1993 (Act 6), 3 P.S. § § 1701-1719. The first set of statewide regulations became effective on October 1, 1997. Act 6 required farms with two or more animal equivalent units per acre annually to prepare and implement nutrient management plans. Existing operations were required to have plans by one year after the date regulations became effective (October 1, 1997). Plans were to be carried out within three years of approval. The State Conservation Commission was given responsibility for developing regulations establishing minimum criteria for nutrient management plans that incorporate BMPs.

In 2002, the State Conservation Commission was required by law to review Act 6 regulations. This extensive review, along with a concurrent policy initiative known as Agriculture, Communities, and Rural

Environment (ACRE), resulted in a new law, the Nutrient Management and Odor Management Act, (Act 38), 3 Pa. C.S.A. § § 501-522, , which replaced Act 6. The nutrient management regulations were revised in accordance with Act 38 and became effective on October 1, 2006, 25 Pa. Code § § 83.1-83.812.

This revised law enhanced the efforts of the State Conservation Commission to oversee the management of nutrients on high animal density operations within the commonwealth. This law serves as a cornerstone of the commonwealth's actions to minimize nutrient pollution coming from agricultural operations.

Pennsylvania's Nutrient Management Law and regulations are included on the following website: http://panutrientmgmt.cas.psu.edu/main_laws_regulations.htm.

4. Agricultural Animal Operations/Manure Management

Pennsylvania regulates the application of manure from certain agricultural operations and requires permits for the construction of certain facilities to store animal waste (25 Pa. Code § 91.36). The *Field Application of Manure* supplement to the *Manure Management for Environmental Protection* manual (Manure Management Manual) was revised and republished by DEP in October 2011 in order to update the manual so that it can be used directly by farmers and to make the Manure Management Manual reflect changes to both Federal and State laws. This revision to the manual was the result of several years of effort, involving countless stakeholders, to ensure the revised manual would be a useful resource for the farming community and those overseeing farmers' efforts to comply with state environmental laws.

The Manure Management Manual provides guidelines that comply with DEP regulations concerning animal manures and agricultural process wastewaters. The criteria established in this updated manual are required to be followed by all operations applying manure or agricultural process wastewater, farms that pasture animals, and farms managing an Animal Concentration Area (ACA) unless the operators obtain a permit or approval from DEP to implement alternative practices.

The provisions of the Manure Management Manual work together with the Agricultural Erosion and Sediment Control Plan required for all farm operations practicing agricultural plowing and tilling. Certain sections of information developed using this manual can be used as part of the Agricultural Erosion and Sediment Control Plan. The land application of animal manures and agricultural process wastewater must follow the standards for development and implementation of a plan to manage nutrients for water quality protection using standards outlined in the Manure Management Manual.

DEP has initiated a significant outreach and education initiative, with the assistance of its delegated program partners at the county conservation districts, to ensure all farmers across the commonwealth are aware of the requirements outlined in the Manure Management Manual as well as the Chapter 102 Erosion and Sedimentation Control Law and planning requirements.

For more information on the Manure Management Manual, refer to website: http://www.portal.state.pa.us/portal/server.pt?open=514&objID=554281&mode=2.

5. Waterways and Wetlands Management

DEP administers waterways engineering and wetlands permitting program mandated by Pennsylvania's Dam Safety and Encroachments Act, 32 P.S. §§ 693.1 – 693.27. The requirements for this permitting program are set forth in Chapter 105 of Title 25 of the Pennsylvania Code. Projects that require stream and wetlands crossings must implement BMPs and, when appropriate, include mitigation measures to ensure the waters of the commonwealth are not adversely impacted.

A Chapter 105 Water Obstruction and Encroachment Permit (WOEP) is needed for any structure or activity which changes, expands or diminishes the course, current or cross section of a watercourse, floodway or body of water. The Dam Safety and Encroachments Act provides for the regulation of water obstructions and encroachments located in, along or across, or projecting into a watercourse, floodway or body of water whether temporary or permanent. A Joint Permit Application process is used when applying for a WOEP from DEP and a federal permit from the U.S. Army Corps of Engineers under Section 404 of the Clean Water Act (33 U.S.C. § 1344) or Sections 9 or 10 of the Rivers and Harbors Act of 1899 (33 U.S.C. § 403). If DEP issues a WOEP, a separate Water Quality Certification is issued under Section 401 of the Clean Water Act (33 U.S.C. § 1341(a)). There is no responsibility on the part of the applicant to initiate the Section 401 review.

For more information, refer to website:
http://www.depweb.state.pa.us/portal/server.pt/community/bureau_of_waterways_engineering_and_wetlands/11202.

6. Stormwater Management Act (Act 167)

DEP administers Pennsylvania's Stormwater Management Program mandated by the Stormwater Management Act (Act 167), 32 P.S. § § 680.1-680.17. Act 167 requires counties to prepare watershed stormwater management plans for designated watersheds and it requires local municipalities to adopt and implement stormwater ordinances consistent with the county's plan. These plans consider hydrologic and hydraulic effects of changes in land use and the quantitative and qualitative impacts on receiving streams. NPS pollution may be considered as one of the components in a plan. The specific issues addressed are:

- Identification of critical NPS subwatersheds based on annual loadings;
- Estimation of annual pollutant loadings under existing and future land use conditions;
- Application of water quality modeling techniques to derive standards and criteria for use by municipalities;
- Identification of BMPs applicable to the watershed; and
- Evaluation of the effectiveness of BMPs.

These water quality issues and associated BMPs are generally addressed as the counties carry out the planning process. When a water quality component is considered, the watershed plan will provide standards and criteria for the NPS water quality controls associated with new development activities. Applicable structural and nonstructural BMPs are recommended within those plans that are unique to the watersheds.

The standards and criteria in the plan are implemented by local municipalities through their codes and ordinances. If local governments desire, construction projects may be undertaken, as recommended within the plan, to minimize water quality degradation of the receiving streams.

The watersheds designated by Act 167 encompass a main stream and all of its tributaries and may encompass several hundred square miles. In a watershed having an approved stormwater management plan, anyone engaged in the alteration or development of the land which promotes earth disturbance or alters the stormwater runoff characteristics, must comply with the requirements of Act 167. Where there is no approved plan, the regulation of stormwater falls under the authority of the Municipalities Planning Code and the applicable level class code. For assistance with Act 167 planning, among other options, counties may use a web-based flowchart tool located at www.paiwrp.com.

For more information, refer to website:
http://www.stormwaterpa.org/assets/media/regulatory/3930-FS-DEP4101.pdf

7. On-lot Sewage Program

DEP administers an On-lot Sewage Program mandated by the Pennsylvania Sewage Facilities Act, 35 P.S. §§ 750.1 – 750.20. The On-lot Sewage Program requires each municipality in the state to develop and implement an official plan dealing with new system designs, as well as creating facilities for local municipalities and the public. Over 900 local SEOs are engaged in the inspection of on-lot septic systems and enforcement of individual sewage disposal regulations.

For more information, refer to website:
http://www.depweb.state.pa.us/portal/server.pt/community/act_537_sewage_facilities_program/10585.

8. Biosolids Program

The commonwealth has regulated biosolids since 1977. Pennsylvania has approximately 256 wastewater treatment plants that generate nearly 2.2 million tons of biosolids yearly. About 50% of biosolids are land applied. Pennsylvania has four biosolids composting sites and nearly 400 sites in the state are permitted for biosolids application. A Beneficial Use of Biosolids by Land Application Permit must be obtained by persons processing biosolids for land application. Only state-certified persons may apply biosolids in Pennsylvania.

In order to ensure the safe use of biosolids, Pennsylvania has updated its applicable regulatory program. These regulations focus on setting strict standards for biosolids quality before land application and require generators to be responsible for the quality of their product.

This new approach was developed after extensive studies by the U.S. Environmental Protection Agency (EPA) and public review in Pennsylvania found land application of biosolids can be environmentally safe and beneficial to the soil. The regulations have been endorsed by the Solid Waste Advisory Committee, the Pennsylvania Water Environment Association and the Pennsylvania Septage Management Association.

Biosolids that do not meet the new environmental standards must either be incinerated or taken to a landfill for disposal.

For more information, refer to website:
http://www.depweb.state.pa.us/portal/server.pt/community/biosolids/10588.

VI. Resource Allocation

Pennsylvania's NPS program focuses on the protection and restoration of impaired stream reaches. Funding for restoration comes from the various program partners outlined in the Management Plan (See Table 5) and is prioritized such that watersheds and pollution sources that cause the largest water quality impacts in the state have a higher priority. The various partners generally have separate prioritization methodologies by which funding is directed for restoration efforts but these methodologies compliment and support each other and work towards the overall goal of restoring impaired water resources. These methodologies focus on parameters such as: highest pollutant loading areas, interest by local landowners to correct identified problems, local community support to implement watershed restoration plans, and others.

A significant amount of funds from multiple sources are devoted to non-point source pollution abatement within the commonwealth. Typically, funding that is devoted to grants and loans (from or through Pennsylvania entities) is used for the purpose of resource restoration and further pollution prevention. Examples of this include Section 319 and Growing Greener grants issued to sub-grantees for stream restoration projects, construction of AMD treatment facilities and the like. Generally speaking, the use of funds allocated as grants are focused on the work of restoration. Further, those funds which are available for restoration work are focused on impaired waters, and in the case of 319 funds, on the implementation of Watershed Implementation Plans (WIPs). Through this strategy, it is believed that restoration efforts will have a greater impact on impaired waters. Funds allocated for other purposes (salaries, equipment, etc.) are used for the full spectrum of environmental protection activities (e.g. restoration, protection, education and outreach, etc.).

For Growing Greener, DEP prioritizes funding to impaired watersheds with TMDLs and implementation plans to address these impairments. Also, this state funded program prioritizes funding to agricultural sites implementing practices to meet state environmental regulations and urban communities working to address identified urban stormwater runoff problems.

The federally funded Section 319 NPS Program prioritizes funding to 36 identified high priority impaired watersheds where an EPA approved WIP is in place. DEP commits to supporting partners active in these watersheds with the implementation of the BMPs called for in these approved WIPs.

Within the priority watersheds selected as described above, these programs direct funding to the headwaters and those subwatersheds that most impact the public or aquatic life in order to have the most meaningful response from the funding provided from these programs. The NPS Program attempts to use funds in the

most efficient manner possible by focusing on very specific sub-watersheds and those areas with significant value to the community.

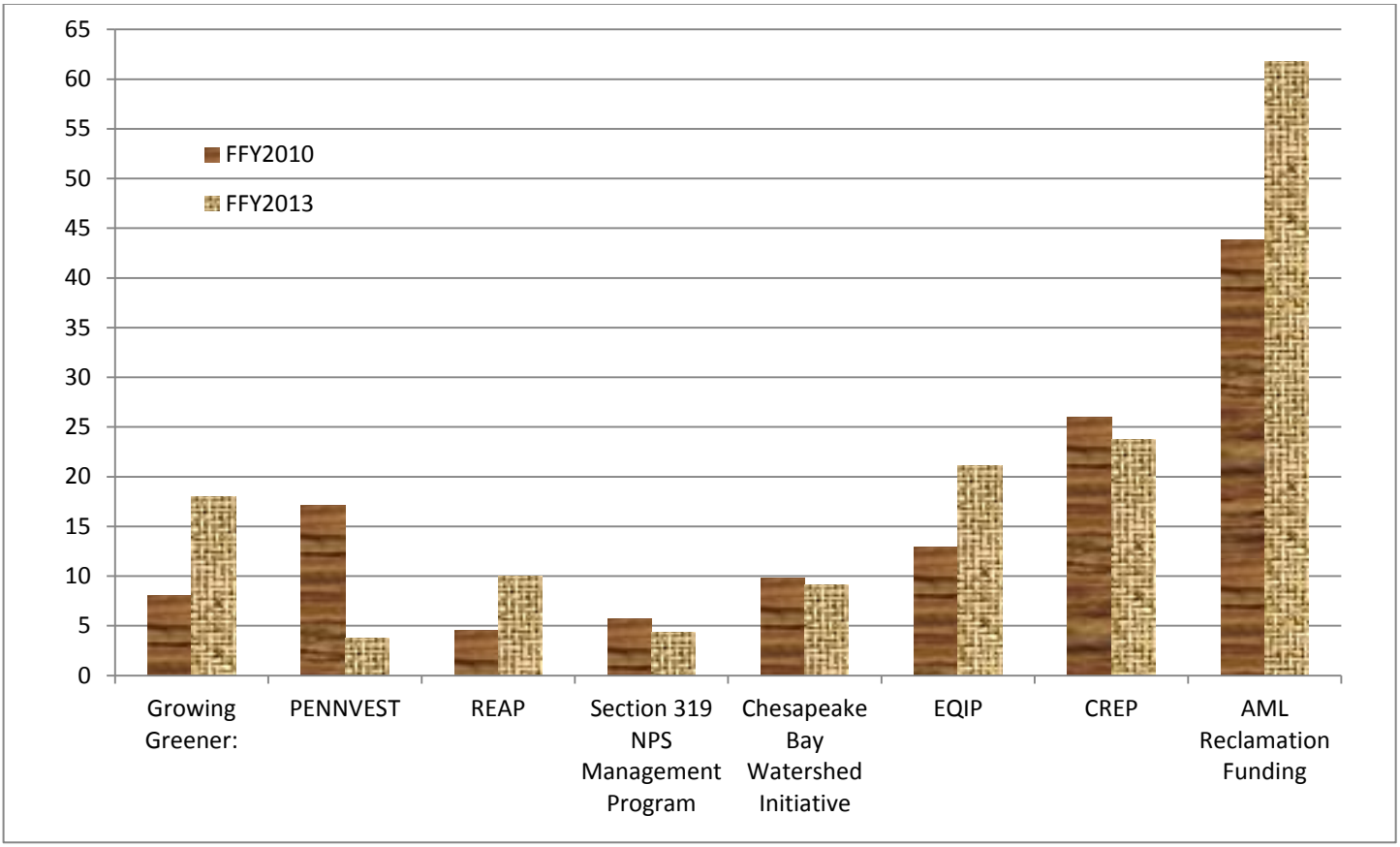

Figure 6: A comparison of funding allocated to certain NPS pollution-focused programs in FFY 2010 and FFY 2013. The dark, horizontal bars represent FFY2010 and the light cross-hatched bars represent FFY2013. The unit of measure on the Y-axis is millions of US Dollars. PENNVEST, Sec 319, USDA NRCS Chesapeake Bay Watershed Initiative and CREP each realized reductions in funding during this time period.

Much like the methodologies used by the various program partners for selecting priority watersheds for restoration funding, the process for selecting projects for funding within the priority watersheds is also varied depending on the program and agency involved.

A majority of the funding for agricultural projects originates from programs administered by the USDA NRCS. These programs have federally directed selection criteria and prioritization processes established. The Pennsylvania State Technical Committee administered by the Pennsylvania office of the NRCS assists with the prioritization and project selection process. Projects in high priority watersheds are given priority in project selection. High priority watersheds are typically those watersheds with high pollutant loadings or identified stress on selected priority organisms. Additional factors governing project selection include the on-farm assessment, which considers the extent of the problems on the site, and the other measures the farmer has taken, or agrees to take, to address environmental concerns.

Pennsylvania's Growing Greener Program selects projects through a statewide Request-For-Proposals (RFP) process. Annually the program solicits non-profit organizations and local government entities to

submit restoration projects to address impaired or threatened stream reaches. These projects are assessed by DEP Watershed Managers to score the projects to determine which are most likely to succeed and provide the largest environmental benefit for the funding requested. The projects are then selected with those receiving the highest environmental benefit score chosen for implementation that particular year.

Pennsylvania's implementation of the 319 NPS Program is run in much the same way as the Growing Greener Program outlined above using an RFP process targeted to the 36 priority watersheds identified under the 319 Program. Annually the program solicits non-profit organizations and local government entities in these 36 watersheds to submit restoration project proposals to implement the practices outlined in their approved WIPs. These proposals are assessed both quantitatively and qualitatively by DEP Watershed Managers and 319 program staff. A numeric score as well as comments pertaining to the soundness of a project is provided for each application. This scoring process is used to determine which projects will likely provide the largest environmental benefit for the funding requested. The projects are then selected with those receiving the highest environmental benefit score chosen for implementation that particular year.

Both the Growing Greener and 319 NPS Program fund a limited number of generalized NPS technical, monitoring and education/outreach projects. These projects are also selected through the above described RFP process with funding going to those projects most likely to lead to the implementation of restoration activities and the restoration of impaired waters.

DEP is working with its NPS program partners to review our current process for identifying high priority watersheds for restoration funding. The state is very interested in identifying watersheds most likely to respond positively to restoration project funding and is working with our program partners to support their efforts to identify priority work areas similarly. This effort is being supported by EPA through the development of a Restoration Potential Index (RPI) tool specifically tailored to Pennsylvania's program needs. Again, the intent is to achieve the greatest amount of environmental benefit per dollar spent by giving a higher priority to watersheds most likely to exhibit a near-term response to BMP implementation.

Restoration efforts planned for the next five year period will continue to be focused on multiple industries and sources with the primary focus being implementation of BMPs found to be necessary and effective in the restoration of impaired waters. Further, the focus will be in BMP implementation in a sub-watershed scale that is most likely to respond to BMP implementation. That sub-watershed scale being watersheds of approximately two to ten square miles in size. The intent will continue to be to maintain an active focus on localized sub-watershed and watersheds thought to be most beneficially reactive to BMP implementation. Through the continued implementation of WIPs and similar watershed restoration plans, the partners involved with NPS pollution abatement will continue to address the NPS pollution problem, at the sub-watershed scale.

Table 5 on the following page lists a number of major sources of funding by entity and program and the amount in millions of dollars each of those sources provided to the objective of NPS pollution management. From Table 5 below, Figure 5 above was created. Figure 5 lists a few of the more notable programs and sources of funding and the amount which was devoted to NPS management both in FFY2010 and FFY2013. As is expected, funding provided to, through, and by these programs fluctuates annually.

Given the variability in funding, it cannot be stated with the utmost certainty that previous funding (and previous performance) is an assurance of future activity. Nevertheless, trends, which are better seen in Figures 6 through 9 below, can serve as an indicator of potential future activity. While funding levels may fluctuate, Pennsylvania benefits from the diverse nature of its existing partnerships. The web of federal, state, and local governments in association with watershed associations, colleges, and universities each provide different assets (funding, manpower, knowledge, locations) from which the effort to address NPS pollution will continue. As is the case with natural ecosystems, diversity fosters stability, so too with the NPS pollution management effort within Pennsylvania.

Four-Year Listing of Funding by Program and Entity

Entity and Program	FFY2010	FFY2011	FFY2012	FFY2013
DEP - Conservation District Watershed Specialist	1.963	1.963	1.963	2.079
DEP - Environment Stewardship and Watershed Protection NPS grants (Growing Greener):	8.073	9.72	12.458	18.008
DEP - Surface Mining Conservation and Reclamation Grant:	1.784	0	0.073	0
DEP - AMD set-aside Grants	0	0	0.252	0.406
DEP - AMD Active Treatment Plant O&M	NA	NA	NA	1.029
DEP and PDA - Conservation District Fund Allocation Program	3.953	3.914	3.875	3.375
DEP – Dirt, Gravel and Low Volume Roads Pollution Prevention Program	3.528	3.528	3.528	3.528
DEP and PDA - Nutrient Management Fund	2.741	3.392	2.828	2.844
DEP - Abandoned Mine Reclamation Program annual Projects	0.380	0.620	0.335	2.605
DEP - American Recovery and Restoration Act (ARRA)	20	1.3	0	0
PA Infrastructure and investment Authority (PENNVEST)	17.149	34.029	20.971	3.712
PA Resource Enhancement and Protection Tax Credits Available	4.500	10	10	10
PA Commonwealth Financing Authority Act 13 NPS Funding (WR and AMD Projects)	0	0	0	10.959
EPA - Section 319 NPS Management Program	5.680	5.004	4.609	4.379
EPA - CBIG Technical and Engineering Assistance	2.613	2.635	2.715	2.723
EPA - CBIG Special Projects:	1.354	0.81	0.737	1.064
EPA - CBRAP	2.667	2.667	2.667	2.667
NFWF - Chesapeake Bay Small Watershed Grant-annual Funding	0.554	0.737	0.702	0.487
NFWF - Chesapeake Bay Innovative Nutrient and Sediment Reduction Grant	0.400	2.55	2.026	1.207
NFWF - Technical Assistance Grant	0	0	0.831	0
NRCS - Ag Management Assistance	0.855	0.700	0.168	0.280
NRCS - Chesapeake Bay Watershed Initiative	9.776	19.400	15.533	9.100
NRCS - Environmental Quality Incentive Program	12.886	13.500	18.636	21.100
NRCS - Farm and Ranchland Protection Program	6.300	4	4.390	3
NRCS - Conservation Stewardship Program (new contracts)	3.975	0.880	0.832	0.700
NRCS - Conservation Stewardship Program (funds obligated to pay on prior year contracts)	0	0	0	6.200
NRCS - Wetlands Reserve Program	4.100	8.600	10	4.750
NRCS - Wildlife Habitat Incentive Program	0.822	0.800	0.892	2.280
FSA - Conservation Reserve Enhancement Program	25.948	22.181	20.690	23.753
FSA - Biomass Crop Assistance Program	3.694	0.020	0.339	0.152
FSA - Grassland Reserve Program	0.049	0.160	0.148	0.618
OSM - AML Reclamation Funding (FY2010)	43.807	47.627	67.152	61.735
TOTAL:	189.55	200.74	209.35	204.740

Table 5: A table listing funding amounts provided to each of the listed programs by federal fiscal year. This data was taken from the NPS Annual Report prepared by DEP. Quantities listed are in millions of US dollars.

Most of the programs listed in Table 5 above reflect grant programs focused on the restoration of degraded resources. This work is imperative for the success of the partners involved. Regardless, DEP and a few of its partners engage in work other than restoration and monitoring; DEP makes full use of its regulatory

authority to protect the natural resource, both resources which have been found to be "healthy" (to use a common term) and those resources which are degraded.

The protection of threatened and high quality waters is addressed in Pennsylvania through our various regulatory programs that require environmental protection measures be taken when new activities on the land surface are proposed. These protections include Pennsylvania's anti-degradation requirements provided in Chapter 93 of the regulations implementing the state's Clean Streams Law. Under these anti-degradation provisions existing in-stream water uses and the level of water quality necessary to protect the existing uses shall be maintained and protected. Likewise, for streams designated as High Quality and Exceptional Value, these regulations require that the water quality and existing uses of these streams be maintained and protected.

Regulatory programs include those developed to address earth disturbance activities, obstructions and encroachments, the mechanical land application of manure and biosolids, the new construction of impervious surfaces, and other activities which may impact or exacerbate existing NPS pollution issues. Implementation of these programs requires the use of funds not reflected in the table above, a significant portion of those funds are allocated to DEP from the commonwealth's available financial resource each year as the state legislature reviews and approves the budget. It is interesting to note that not 100% of the funds used for regulatory purposes come from the annual state budget. One example of federal funds used for regulatory purposes is the on-going Chesapeake Bay Regulatory and Accountability Program (CBRAP). In the previous five year cycle, CBRAP funds were used to conduct inspections at earth disturbance activities regulated under 25 PA. Code 102.4(a). Those funds were used to fund positions that conducted inspections and carried out enforcement activities as needed. It is reasonable to state that, for at least part of the upcoming five year cycle, CBRAP funds will continue to be available and used for this purpose.

Aside from DEP, few other agencies engage in regulatory efforts associated with the conservation of the soil and water resource. FBC, DCNR, SCC, and PGC all have regulatory authority, and while the focus of those agencies is much broader than water resource protection or non-point source pollution abatement, those agencies do engage in activities which further Pennsylvania's water resource protection effort.

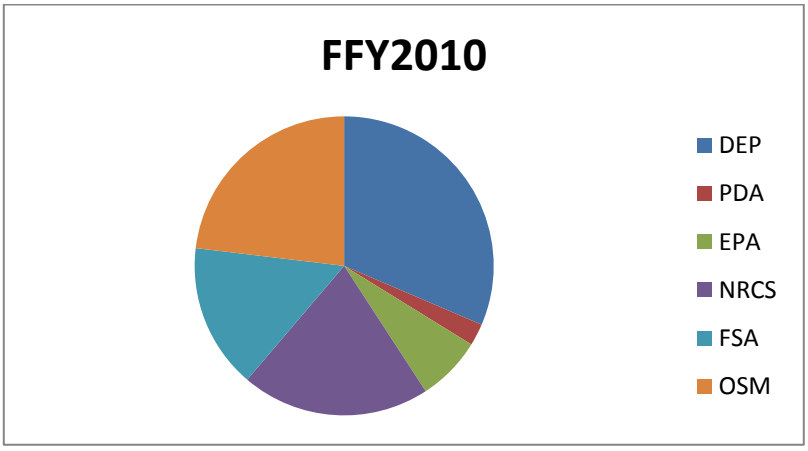

Figure 7: A display of the relative amount of funds from multiple state and federal entities as those funds were reported in FFY 2010 and having been declared as focused on NPS pollution abatement. Note, this table does not reflect funds used by certain other state agencies (DCNR, PGC, and FBC) which may have been used to curtail the negative impacts of NPS pollution.

As stated previously and in regards to Figure 6 through Figure 9, we cannot assume that past allocations are an indication of future availability. And indeed, a cursory review of Figure 6 through Figure 9 show there has been some variability in the availability of funds and sources of funds over the previous four fiscal years.

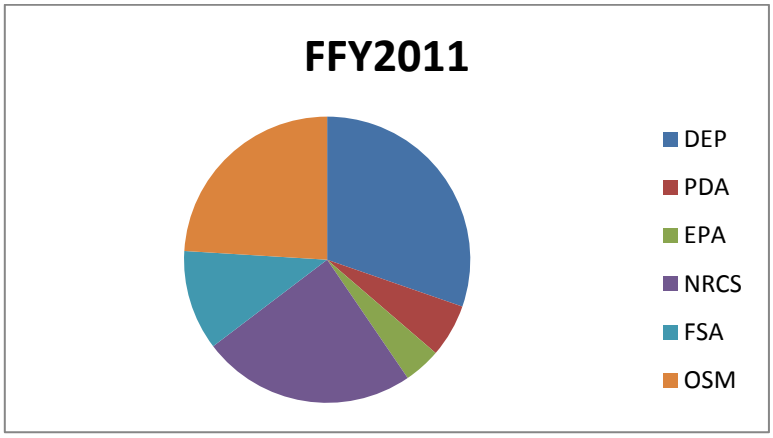

Figure 8: A display of the relative amount of funds from multiple state and federal entities as those funds were reported in FFY 2011 and having been declared as focused on NPS pollution abatement. Note, this table does not reflect funds used by certain other state agencies (DCNR, PGC, and FBC) which may have been used to curtail the negative impacts of NPS pollution.

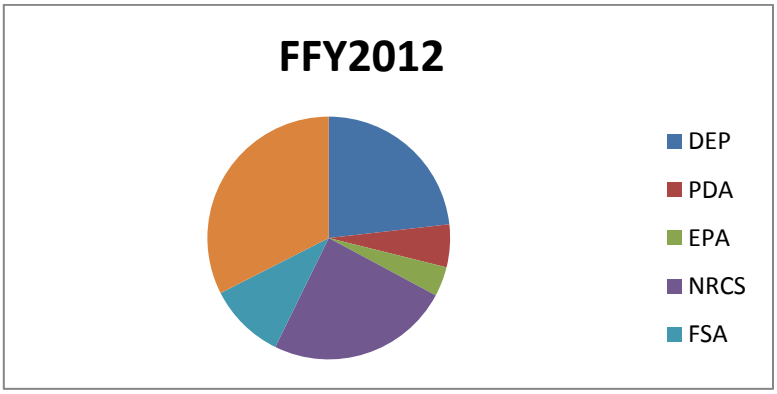

Figure 9: A display of the relative amount of funds from multiple state and federal entities as those funds were reported in FFY 2012 and having been declared as focused on NPS pollution abatement. Note, this table does not reflect funds used by certain other state agencies (DCNR, PGC, and FBC) which may have been used to curtail the negative impacts of NPS pollution.

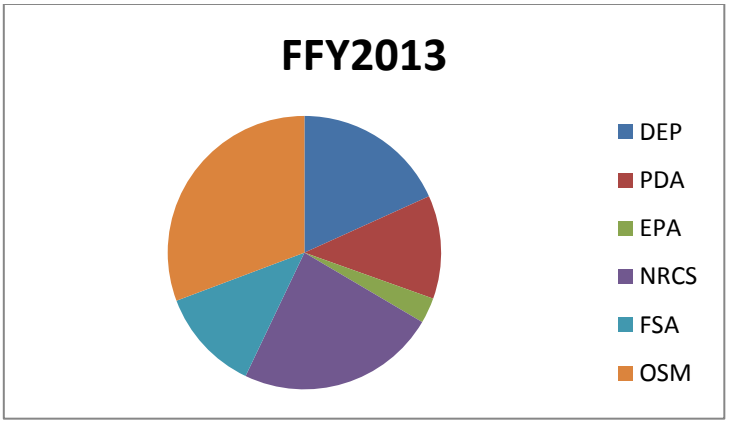

Figure 10: A display of the relative amount of funds from multiple state and federal entities as those funds were reported in FFY 2013 and having been declared as focused on NPS pollution abatement. Note, this table does not reflect funds used by certain other state agencies (DCNR, PGC, and FBC) which may have been used to curtail the negative impacts of NPS pollution.

The Figures and Table above depict both the agency sources and programs to which funding is allocated. With respect to priority setting and the balance between protection of existing, less-degraded waters (waters attaining their designated uses) and restoration of waters which are degraded, the priorities are set through a collaborative effort between agencies from which funds are available and the local and private partners who engage in restoration. Generally speaking, the objective of protecting non-degraded water resources is a task delegated to those individuals in DEP who are responsible for regulatory program implementation. Pennsylvania, through the efforts of DEP's expansive inspection, permitting, compliance, and enforcement services in association with other sections of DEP whose focus is assessment and monitoring, work to maintain the health of those waters that have not been significantly degraded.

VII. Methods of Water Quality Assessment

Pennsylvania enlists the services of DEP to assess the streams and lakes within the bounds of the commonwealth. This work is performed on a state wide basis biannually and results in the production of a document commonly referred to as the *Integrated List*. The Integrated List satisfies both Section 303d and 305b of the Clean Water Act. In the production of this document, DEP conducts physical, chemical and biological assessments of both lakes and streams. DEP established criteria by which these water bodies are assessed. As of the drafting of this five year plan, DEP is concurrently in the process of drafting a new or updated Standard Operating Procedures (SOP) that will be made available to partners who are actively engaged in restoration and monitoring on behalf of DEP. That SOP will restate methods by which the water resource may be assessed, as well as introduce new classifications to more clearly establish when levels of impairment are, through a process of observation, shown to be on the decrease.

While DEP remains the primary source of water resource assessment and classification in Pennsylvania, program partners such as county conservation districts and citizen groups such as the Senior Environmental Corp (SEC) continue to provide additional monitoring and assessment services. It is anticipated that, throughout the course of the next five years, there will be increased collaboration between these partners with the intent of gaining a more thorough or complete understanding regarding the status of certain water resources.

VIII. Baseline requirements

To the extent that program partners who engage in NPS pollution abatement interact with state and federal programs which may, directly or indirectly, address such pollution abatement activities, those partners strive to comply with all relevant baseline program requirements. As such, any such baseline program requirements are incorporated here by reference.

Within this commonwealth, the programs that most likely address, either directly or indirectly, NPS pollution include: the Concentrated Animal Feeding Operation (CAFO) and Concentrated Animal Operation (CAO) program, the National Pollution Discharge Elimination System (NPDES) as it pertains to stormwater runoff from new construction sites, the Municipal Separate Storm Sewer System (MS4) permitting program, the Act 167 Stormwater Management Planning program, Chapter 91 Manure Management, regulation of encroachments and obstructions through the implementation of the Chapter 105 program and the enforcement of the Dam Safety and Encroachment Act, and regulation of earth disturbance activities through the implementation of the Chapter 102 program and the enforcement of the Clean Streams Law.

IX. Effective and Efficient Management

To properly manage and wisely use all Section 319 funds appropriated to the commonwealth, DEP has long established and will continue to maintain a system of checks and balances by which funds are appropriately devoted to: the planning and construction of BMPs designed to address NPS pollution, the implementation of WIPs, the education of citizens, and the monitoring and assessment of the water resource.

DEP continues to encourage sub-grantees under the 319 Program to focus the use of those funds first of design of BMPs proposed in EPA approved WIPs followed by construction of those BMPs that are designed. By maintaining a logically segmented process, DEP provides a funds-management system that provides for smart project selection and efficient use of funding.

Further, to ensure the efficient implementation of projects and funds, DEP encourages sub-grantees to plan projects that can be completed within three years. DEP began implementing this management philosophy several years ago in response to projects lasting four and five years. It is the intent of DEP to continue operating under this management philosophy such that program funds will be used in the most efficient manner practical and such that project costs will be less susceptible to the volatility of the market and greater economic conditions.

X. Programmatic Review

The commonwealth's NPS pollution management program undergoes an evaluation annually as the Annual Report associated with this program is drafted and reviewed by EPA and under EPA's evaluation of Satisfactory Progress Determination under the NPS Program grant requirements. By annually reviewing achievements met, or not met, a determination is made regarding the efficacy of this program. Further, as DEP engages in monitoring of the water resource and bi-annually produces the Integrated List, an environmental assessment of program effectiveness is made.

XII. Appendices

Appendix A: Tracking Table

Appendix B: List of Acronyms

Appendix C: NPS Program Components

Appendix A-Tracking Table

Goal	Objective	FFY 2015	FFY 2016	FFY 2017	FFY 2018	FFY 2019
		Actual Amount Achieved				
Improve and protect the waters of the commonwealth from non-point source pollution associated with Abandoned Mine Drainage and other energy resource extraction activities.	1.1 Provide for the operation and maintenance of 46 Pennsylvania-operated AMD treatment systems each year for the next five years.					
	1.2 Engage in land reclamation projects resulting in the reclamation of 500 acres of abandoned mine lands (AML) each year for the next five years.					
	1.3 Provide funding and other assistance for the installation of four new AMD treatment systems annually for the next 5 years.					
	1.4 Authorize 7 WPCAMR Quick Response projects each year for the next five years.					
	1.5 Plug 40 oil and gas wells each year for the next five years.					
	1.6 Through load-reduction efforts with the installation of four new AMD treatment systems, an additional 10,000 pounds of iron will be reduced from the non-point source pollutant stream each year.					
	1.7 Through load-reduction efforts with the installation of four new AMD treatment systems, an additional 3,000 pounds of aluminum will be reduced from the non-point source pollutant stream each year.					
	1.8 Through load-reduction efforts with the installation of four new AMD treatment systems, an additional 10,000 pounds of acidity will be reduced from the non-point source pollutant stream each year.					
	1.9 Through load-reduction efforts with the current operational passive treatment systems, 1,000,000 pounds of iron will continue to be reduced from the non-point source pollutant stream each year.					

Goal	Objective	FFY 2015	FFY 2016	FFY 2017	FFY 2018	FFY 2019
		Actual Amount Achieved				
	1.10 Through load-reduction efforts with the current operational passive treatment systems, 200,000pounds of aluminum will continue to be reduced from the non-point source pollutant stream each year.					
	1.11 Through load-reduction efforts with the current operational passive treatment systems, 9,000,000pounds of acidity will continue to be reduced from the non-point source pollutant stream each year.					
	1.12 Through load-reduction efforts with state operated active treatment systems, 750,000 pounds of iron will continue to be reduced from the non-point source pollutant stream each year.					
	1.13 Through load-reduction efforts with state operated active treatment systems, 150,000 pounds of aluminum will continue to be reduced from the non-point source pollutant stream each year.					
	1.14 Through load-reduction efforts with state operated active treatment systems, 6,500,000 pounds of acidity will continue to be reduced from the non-point source pollutant stream each year.					
	1.15 Through load-reduction efforts with state operated active and passive treatment systems, 8 billion gallons per year (BGY) of water will be treated reducing non-point source pollutant entering waters of the commonwealth each year.					
Improve and protect the waters of the commonwealth from non-point source pollution associated with Agricultural activities.	2.1 Implement the Targeted Watershed Initiative in 15 agriculturally impaired watersheds within the next five years.					
	2.2 Conduct inspections on 350 CAFO operations in the commonwealth within the next five years.					

Goal	Objective	FFY 2015	FFY 2016	FFY 2017	FFY 2018	FFY 2019
		Actual Amount Achieved				
	2.3 Implement BMPs on 50 agricultural operations per year using state directed funds. These BMPs will be for the mitigation of soil loss and/or wise management of nutrients.					
	2.4 Support the review of 30 Nutrient Credit trade applications annually.					
	2.5 Conduct 2,000 agricultural compliance outreach/education visits on farms in the Chesapeake Bay watershed each year until all farms in the Chesapeake Bay watershed have been visited.					
	2.6 Provide 6 FTEs under the PACD TAG Grant for designing and installing Ag BMPs.					
	2.7 Support a minimum of 35 Chesapeake Bay Program Agricultural Technicians and 4 Agricultural Engineers each year for the next five years.					
	2.8 Provide support for the implementation of five innovative environmental technology projects (focused on agriculture) within the next five years.					
	2.9 Support the certification of 600 certified manure haulers within the commonwealth annually.					
	2.10 Support the certification of 300 certified Nutrient Management Specialists within the commonwealth annually.					
	2.11 Maintain the implementation of approved Act 38 Nutrient Management Plans on 300,000 acres of farmland regulated as CAOs and CAFOs each year for the next five years.					
	2.12 Establish a baseline number of non-CAO/CAFO farmed-acres under an NMP or MMP by the end of FFY 2015 and increase that number by 5% annually.					

Goal	Objective	FFY 2015	FFY 2016	FFY 2017	FFY 2018	FFY 2019
		Actual Amount Achieved				
	2.13 Continue the use of the PA One Stop program such that the number of fields entered into that system increase by 10% each year over the next five years.					
Improve and protect the waters of the commonwealth from non-point source pollution associated with stormwater run-off, as well as streambank and shoreline degradation.	3.1 Conduct 11,000 inspections under the Chapter 102 and Chapter 105 programs annually for the next five years.					
	3.2 Continue to implement the MS4 program through oversight and verification that MS4 communities abide by their permit requirements.					
	3.3 Continue to administer the Act 167 program directing counties to obtain and implement county wide stormwater management plans.					
	3.4 Implement 40 new, state-funded stream restoration and/or stormwater management projects annually for the next five years.					
	3.5 Address 500 new Dirt, Gravel, and Low Volume (DGLV) Road sites each year for the next five years.					
	3.6 Support using state managed funds, the completion of 15 miles of stream restoration and/or bank stabilization projects over the next five years.					
	3.7 State wide, enroll and maintain 50,000 acres of new land in the CREP program over the next five years.					
	3.8 Plant and protect 5,000 acres of riparian forest buffer for the next five years.					
	3.9 Through a forest land-owner stewardship program, develop 30 new plans annually which should account for 5,000 new acres of privately owned forest land each year for the next five years.					

Goal	Objective	FFY 2015	FFY 2016	FFY 2017	FFY 2018	FFY 2019
		Actual Amount Achieved				
	3.10 Plant 10,000 new trees under the TreeVitalize program each year for the next five years.					
	3.11 Encourage activities within US Forest Service selected priority watersheds identified under the USFS Watershed Condition Framework within the borders of the Allegheny National Forest (ANF) to the extent that these priority watersheds within the ANF are categorized as "Functioning Properly."					
Demonstrate the efficacy of Pennsylvania's non-point source pollution management efforts through enhanced data collection.	4.1 Establish a process to collect BMP data at the state, watershed and sub-watershed level.					
	4.2 Further develop and maintain PA One Stop to allow the NPS Program to collect the number of fields and acres planned through the use of this tool and to spatially summarize data by watershed.					
	4.3 Continue to develop and improve our Reclaimed Abandoned Mine Land Inventory System (RAMLIS) GIS Tool.					
	4.4 Ensure that the Datashed GIS web tool adequately describes available information relating to the approximate 300 AMD Treatment Systems sites that are treating mine discharges across PA, and ensure that access to this information is available to the public.					
	4.5 Through the implementation and maintenance of the Water Quality Network (WQN),water quality field observations and data collection will occur on 173 monitoring sites each year over the next five years.					
	4.6 In addition to other monitoring efforts, the DEP will monitor 20 lakes each year for the next five years.					

Goal	Objective	FFY 2015	FFY 2016	FFY 2017	FFY 2018	FFY 2019
		Actual Amount Achieved				
	4.7 Through monitoring and assessment efforts conducted by DEP, 60 miles of streams previously impacted by NPS related causes shall be documented as newly delisted from Category 5 and/or Category 4a in the bi-annual Pennsylvania Integrated Water Quality and Monitoring Report.					
	4.8 Through monitoring and assessment efforts conducted by DEP, 1,500 lake acres previously impacted by NPS related causes shall be documented as newly delisted from Category 5 or Category 4a over the next five years.					
	4.9 Implement grant funded projects designed to determine BMP effectiveness on at least three priority watersheds.					
	4.10 Within the next five years, establish a process to input all monitoring data collected by the PA DEP NPS Program into STORET.					
	4.11 Through state-wide NPS pollutant load-reduction efforts, 850,000 pounds of nitrogen will be reduced from the non-point source pollutant stream each year.					
	4.12 Through state-wide load-reduction efforts, 50,000 pounds of phosphorus will be reduced from the non-point source pollutant stream each year.					
	4.13 Through state-wide load-reduction efforts, 15,000 tons of sediment will be reduced from the non-point source pollutant stream each year.					
	4.14 Prevent waterbodies currently not listed as impaired for the aquatic life use designation from being listed as impaired for that designated use through implementation of existing regulatory programs.					

Goal	Objective	FFY 2015	FFY 2016	FFY 2017	FFY 2018	FFY 2019
		Actual Amount Achieved				
	4.15 Establish a data collection framework by which information regarding the obtainment of nutrient and manure management plans (NMPs/MMPs) on non-CAO/non-CAFO farms is collected and counted in terms of acres covered.					
	4.16 DEP will develop a process to collect and report on the amount of biosolids land applied following the water quality criteria established under DEP's Municipal Waste regulations.					
Demonstrate Pennsylvania's non-point source pollution management efforts through enhanced data dissemination efforts.	5.1 Provide a clear and concise report to the EPA, the general public, regulators, partners and others interested in Pennsylvania's NPS pollution abatement efforts outlining the major accomplishments of Pennsylvania's NPS Program consistent with EPA reporting guidelines.					
	5.2 Develop 2 success stories per year.					
	5.3 Provide detailed BMP implementation reporting on 10 approved WIPs per year.					
	5.4 Implement the identified BMPs expected to restore four sub-watersheds included within §319 approved WIPs by the end of the 2019 Federal Fiscal Year. (Achievement of this goal may be measured against full implementation of the BMPs listed in the select sub-watersheds included in the §319 approved WIPs).					
	5.5 Fully implement the BMPs expected to restore three select watersheds supported under Pennsylvania's Growing Greener Program's Renaissance Initiative by the end of the 2019 Federal Fiscal Year.					
	5.6 Document farmer compliance with erosion and sedimentation control and manure management regulations in 15 watersheds by the end of the 2019 Federal Fiscal Year.					

Goal	Objective	FFY 2015	FFY 2016	FFY 2017	FFY 2018	FFY 2019
		Actual Amount Achieved				
	5.7 Report semi-annually on progress on implementing the active Section 319 grant work plans ensuring status reports are current for at least 90% of the active grant projects in the GRTS database.					
	5.8 Complete Watershed Plan Tracker (WPT) data entry by the end of 2017. DEP will continue to input current information in the WPT throughout the five year life of this Plan to ensure accuracy of data.					

Appendix B- Acronyms and Abbreviations

ACOE	Army Corps of Engineers
AMS	Above Mean Sea-level
AMD	Acid Mine Drainage
AMLIS	Abandoned Mine Land Inventory Sites
ANF	Allegheny National Forest
Assoc.	Association
BAMR	Bureau of Abandoned Mine Reclamation
Bay WIP	The Chesapeake Bay Watershed Implementation Plan (not to be confused with §319 approved WIPs drafted for a very specific 35 watersheds within the commonwealth)
BCR	Bureau of Conservation and Restoration
BDMO	Bureau of District Mining Operations
BGY	billion gallons per year
BMP	Best Management Practice
CAFO	Concentrated Animal Feeding Operation
CAO	Concentrated Animal Operation
CB WIP	See “Bay WIP”
CD	Conservation District
CFA	Commonwealth Finance Authority
Chesapeake Bay WIP	See “Bay WIP”
CREP	Conservation Reserve Enhancement Program
CWA	Clean Water Act
DCNR	(Pennsylvania) Department of Conservation and Natural Resources
DCED	Department of Community and Economic Development
DEP	(Pennsylvania) Department of Environmental Protection
DE	Delaware
DOD	Department of Defense
DOI	Department of Interior
DRBC	Delaware River Basin Commission
EPA	Environmental Protection Agency
EPCAMR	Eastern Pennsylvania Coalition for Abandoned Mine Reclamation

EQIP	Environmental Quality Incentives Program
ESM	Environmentally Sensitive Management
E&S	Erosion and Sedimentation
EV	Exceptional Value
FEMA	Federal Emergency Management Agency
FFY	Federal Fiscal Year
FSA	Farm Service Agency
FTE	Full Time Equivelant
FY	Fiscal Year
GIS	Geographic Information System
GRTS	Grants Reporting and Tracking System
HQ	depending on context; High Quality or Headquarters
ICE	In-stream Comprehensive Evaluation
IPM	Integrated Pest Management
MD	Maryland
MOA	Memorandum of Agreement
MOU	Memorandum of Understanding
Mt.	Mount or Mountain
MS4	Municipal Separate Storm Sewer
NFWF	National Fish and Wildlife Foundation
NFIP	National Flood Insurance Program
NGO	Non-Government Organization
NJ	New Jersey
NOAA	National Ocean and Atmospheric Agency
NOMA	Nutrient and Odor Management Act
NPDES	National Pollution Discharge Elimination System
NPS	Non-point Source
NRCS	National Resource Conservation Service
O&M	Operation and Maintenance
OM&R	Operation, Maintenance, and Replacement
ORSANCO	Ohio River Valley Water Sanitation Commission
OSM	Office of Surface Mining
PA	Pennsylvania

PCSM	Post Construction Stormwater Management
PA SEC	Pennsylvania Senior Environmental Corps
PaFBC	Pennsylvania Fish and Boat Commission
PACD	Pennsylvania Association of Conservation Districts
PDA	Pennsylvania Department of Agriculture
PennDOT	Pennsylvania Department of Transportation
PGC	Pennsylvania Game Commission
PSU	Penn State University
PWRP	Pennsylvania Wetland Reserve Program
RAMLIS	Reclaimed Abandoned Mine Land Inventory System
RBP	Rapid Bioassessment Protocol
RC&D	Resource Conservation and Development
RPI	Restoration Potential Index
SCC	State Conservation Commission
SEOs	Sewage Enforcement Officers
SMCRA	Surface Mine Control and Reclamation Act of 1977
SRBC	Susquehanna River Basin Commission
SSWAP	Statewide Surface Water Assessment Program
STEPL	Spreadsheet Tool for Estimating Pollutant Loads
TU	Trout Unlimited
TMDL	Total Maximum Daily Load
USNPS	United States National Parks Service
USDA	United States Department of Agriculture
USFS	United States Forest Service
USGS	United States Geological Service
WAs	Watershed Associations
WIP	Watershed Implementation Plan
WPCAMR	Western Pennsylvania Coalition for Abandoned Mine Reclamation
WREN	Water Resources Education Network

Appendix C: §319(b) Program Components

A. Identification of measures used to control NPS pollution

For a more thorough discussion on the measures by which NPS pollution will be addressed within the borders of Pennsylvania, refer to Section V, Component 3 and Table 4 located within that section. In summary, over the next five years, state and local government entities will continue to implement regulatory programs (MS4, Act 167, NOMA, Chapter 102 etc.) to curtail the further discharge of NPS pollutants into the waters of the commonwealth. Further, those governmental partners along with other partners will continue to leverage funds and implement BMPs designed to address existing pollution sources.

B. ID of the key programs

Refer to Table 4 above for a list of key programs used within the commonwealth to address NPS pollution.

C. Description of program coordination/integration

The hub of the programs and partners engaged in NPS focused work in Pennsylvania is DEP's Bureau of Conservation and Restoration (BCR). BCR functions to connect partners to projects and programs at the state level and encourages the synergistic collaboration of funding sources. County conservation districts serve as a key entity for coordinating programs and projects at the local level.

D. Schedule with goals, objectives, and strategies (GOS)

Refer to Section 3 above for a listing of goals, objectives, and strategies.

E. Source of funding

Refer to Figures 6 through 9 and Table 5 for a list of known and significant funding sources. As stated previously, realize that some funding sources, such as private funds and funds from the PGC, DCNR, and FBC are not referenced.

F. Federal land management programs etc.

Refer to Section IV.D above for a discussion on federal land withholdings within the commonwealth.

G. Monitoring and evaluation programs used to determine program effectiveness

Program effectiveness will be judged in part against the accomplishment of the stated objectives listed in Section 3 of this document. Annually, DEP will produce a report on the activities which occurred in the commonwealth to the satisfaction of those objectives. Additionally, DEP will continue to monitor water bodies throughout the commonwealth to determine their level of degradation and improvement.

An Equal Opportunity Employer

6/2015