pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION
Office of Water Resources Planning

Commonwealth of Pennsylvania
Nonpoint Source MANAGEMENT PLAN

2019 Update

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I. Introduction

A. Program History and Past Performance

The Federal Water Pollution Control Act of 1948, amended as 33 U.S.C. Sections 1251-1376, was essentially the first federal law to address water pollution. It was amended in 1972 and became 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 U.S.C. Section 1329, to address problems caused by nonpoint source pollution. Unlike point source pollution, which originates from a clearly defined location, nonpoint source pollution originates from a broad area resulting from large scale human activities. Sometimes referred to as "polluted runoff," nonpoint source 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 of the CWA required each state to prepare an Assessment Report and Management Plan for the state Nonpoint Source (NPS) Management Program. In the Assessment Report, the states were required to identify significant nonpoint source pollution sources. The Management Plan identified the program components to address nonpoint source pollution problems outlined 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 United States Environmental Protection Agency (EPA) to implement provisions of the Management Plan.

The Section 319 NPS Management Program (NPS Management Program) guidance requires each state to update its NPS Management Plan every five years. Pennsylvania last updated its NPS Management Plan in 2014. The 2014 update included regulatory, non-regulatory, financial and technical assistance programs to maintain and improve surface and groundwater quality.

The Department of Environmental Protection (DEP) has received approximately $127 million from the Section 319 Grant Program (Federal Fiscal Years (FFY) 1990 through 2018). The funding supported efforts to manage and abate nonpoint source pollution in Pennsylvania; implement various innovative technologies to treat nonpoint source pollution problems; develop educational programs; and launch comprehensive watershed initiatives.

The Pennsylvania *Nonpoint Source Management Plan 2019 Update* outlines ongoing efforts and activities to address nonpoint source pollution through 2024, based on adequate resources including necessary personnel. The NPS Management Plan will be updated with a midpoint assessment to reflect recommendations from a 2020 DEP NPS Management Program Assessment.

The update enhances the previous Pennsylvania's NPS Management Program approved by EPA in 2014 in compliance with Section 319(b). The NPS Management Plan establishes overall strategies implemented by partners in Pennsylvania to address nonpoint source pollution impacts.

The NPS Management Plan expands and enhances Pennsylvania's NPS Management Program and includes education and outreach, technical assistance, financial assistance, monitoring, compliance, and enforcement programs, along with technology improvements to maintain and improve surface and groundwater quality. The NPS Management Plan is organized into several sections aligned with EPA's successful NPS Management Program components. Component 1 is a review of the Goals, Measurable Objectives and Strategies to address Pennsylvania's nonpoint source pollution. Component 2 reviews the NPS Management Program partnerships within

Pennsylvania. Component 3 reviews ongoing and continuing programs to address nonpoint source pollution. Component 4 discusses Pennsylvania's nonpoint source pollution financial resources. Component 5 discusses Pennsylvania water quality assessment methods. Component 6 reviews program components required by Section 319(b). The components consist of:

- Measures to control nonpoint source pollution
- Key implementation programs
- Program coordination to implement nonpoint source pollution controls
- Schedule of goals and objectives for implementation
- Funding sources, federal programs
- Description of the monitoring/evaluation to determine NPS Management Program effectiveness.

Component 7 highlights the baseline requirements found in statutory and regulatory programs relating to nonpoint source pollution abatement and activities. Component 8 briefly discusses fiscal management, and Component 9 discusses programmatic review.

The 2019 update of the NPS Management Plan continues the NPS Management Plan (2014 Update). For the goals and accomplishments outlined in the 2014 Update, please refer to the NPS Management Program Annual Reports. NPS Management Program Annual Reports can be found on the DEP website, a link is provided below.

https://www.dep.pa.gov/Business/Water/PlanningConservation/NonpointSource/Pages/default.aspx

B. Social and Physical Setting

The Commonwealth of Pennsylvania, also known as the Keystone State given its geographic location, is 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 with a population of over 12.8 million. Pennsylvania ranks third in 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.

Table 1: A list of states in the Mid-Atlantic Region, listed by rank based on population.

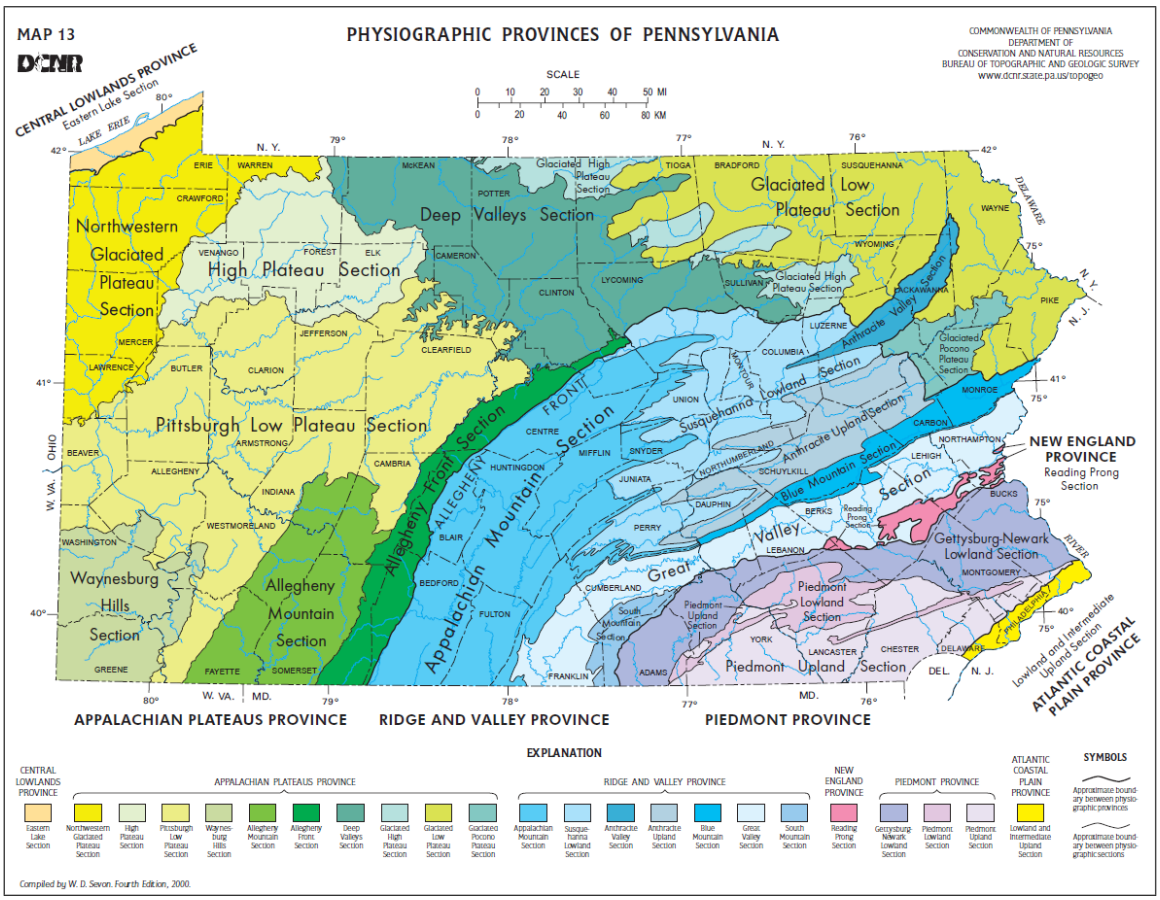
Mid-Atlantic Rank	State	National Rank	Population
1	Pennsylvania	5	12,805,537
2	Virginia	12	8,470.020
3	Maryland	19	6,052,177
4	West Virginia	38	1,815,857
5	Delaware	45	961,939

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

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

Pennsylvania can be divided into six unique physiographic provinces, each province providing unique challenges for water resource management. The six provinces are: Atlantic Coastal Plain Province, Piedmont Province, Ridge and Valley Province, New England Province, Appalachian Plateaus Province, and the Central Lowland Province. Throughout the provinces, a wide variety of topographic and geologic features are 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. The lowest point in Pennsylvania is situated near sea level (PA, NJ, DE border in the Delaware River) and rises to an elevation of 3,213 feet above mean sea level (AMS) on the summit of Mt. Davis in Somerset County.

Figure 1: Map of the 6 major physiographic providences of Pennsylvania and the associated physiographic sections.

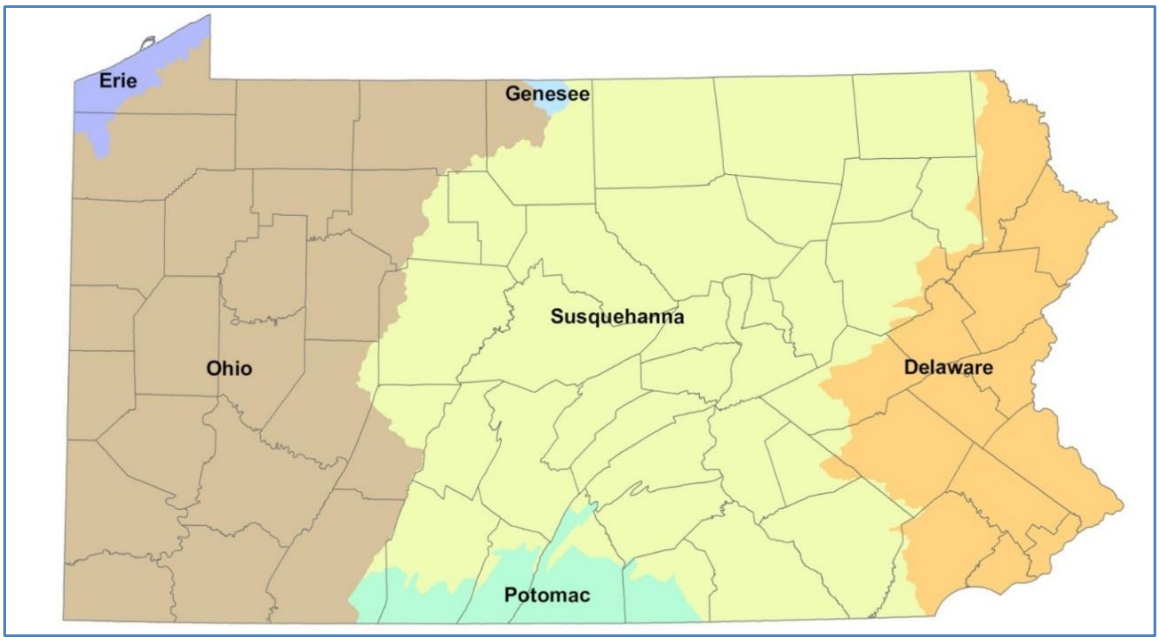


Pennsylvania is a temperate region classified by some as in the humid continental zone. Average rainfall in Pennsylvania is roughly 43 inches per year but varies significantly within the state.

Some cities experience an average of 33 inches per year of precipitation while others receive an average of 53 inches. Average temperatures in Pennsylvania are around 63° Fahrenheit but can also vary. 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 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: Lake Erie Basin, Genesee River Basin, Ohio River Basin, Susquehanna River Basin, Potomac River Basin, and Delaware River Basin. Two river basins, Susquehanna (Pennsylvania's largest) and Potomac ultimately flow into the Chesapeake Bay.

Figure 2: A map showing the six major river basins of Pennsylvania. County boundaries are also depicted.



Source: Bedford County Conservation District

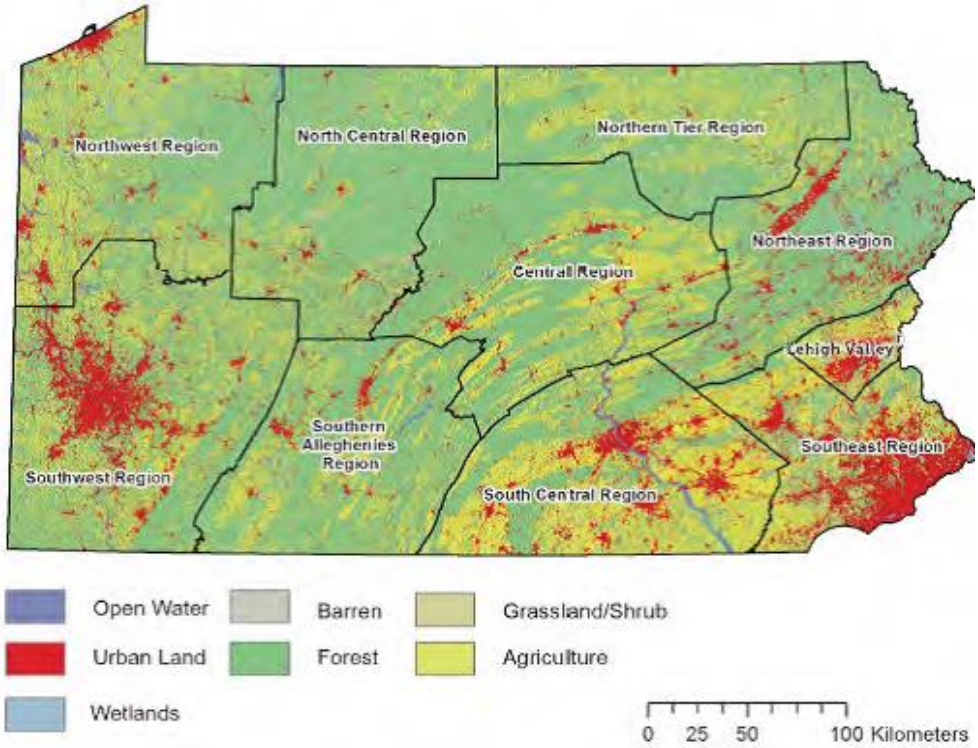
Pennsylvania is significantly more diverse than many other states in the nation. Pennsylvania is home to 67 counties, and each county is further divided into municipalities including townships, boroughs, and cities. Pennsylvania is home to 2,562 municipalities, each one possessing its own unique set 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 overlapping jurisdictions increase the complexity of governing certain resource management 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. Section 680.1-680.17, counties may adopt a county-wide stormwater management plan but further acceptance by 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 as well as the Municipal Separate Storm Sewer System (MS4) permits which

may be issued to certain communities. 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, it is 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 home to a significant amount of forest and land-use devoted to agriculture. Suburban areas are also common throughout the Commonwealth, with a concentration in the southern portion of the State. Since the drafting of the last NPS Management Plan in 2014, 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 depicting land use in Pennsylvania in 2015.



Source: National Land Cover Database from Landsat satellite imagery, PA DCNR

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 NPS Management Plan and the implementation of the strategies set forth to accomplish those goals will focus the efforts to address Pennsylvania's nonpoint source pollution. It is important to realize, the true foundation of this NPS 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, *The Pennsylvania Integrated Water Quality Monitoring and Assessment Report*, commonly referred to as the Integrated Report. The Integrated Report is prepared in accordance with requirements of the CWA Sections 303d and 305b. CWA Section 303(d) requires that States develop lists of all

impaired waterbodies and prioritize those waters for establishment of plans to restore degraded areas. CWA Section 305(b) requires States to report on the overall condition of aquatic resources. The Integrated Report satisfies the requirements of both CWA Sections 303(d) and 305 (b).The most current edition of the Integrated Report was issued in 2018. DEP now offers a story map version of the report, which can be found at the following link:

https://www.dep.pa.gov/Business/Water/CleanWater/WaterQuality/IntegratedWatersReport/Pages/default.aspx

For the time period covered by this NPS Management Plan (FFY 2019 through FFY 2024), two editions of the Integrated Report are expected to be released. DEP uses the results of the Integrated Report to help gauge the success of those involved with the abatement of nonpoint source pollution. For the most detailed discussion on the health of the water resources located in Pennsylvania, interested individuals should read and review the Integrated Report. The NPS Management Program Annual Report contains a simplified discussion of the Integrated Report related to the activities performed to address nonpoint source pollution. It is not the purpose of this NPS Management Plan to provide an in-depth review of the Integrated Report.

Nonpoint source pollution threats to the waters of the Commonwealth originate from several sectors. Primarily, nutrients and sediment originating from agricultural activities, metals originating from a legacy of energy resource extraction, an excessive volume of stormwater and other pollutants associated with land development (e.g. construction of residential housing developments, commercial warehousing, transportation facilities) can all work against the health of waterbodies in Pennsylvania if these issues are not properly addressed by individuals involved in those activities.

D. Overview of the NPS Management Plan

The NPS Management Plan contained herein establishes six major goals. The six goals serve as the basis for evaluating the effectiveness of the Pennsylvania NPS Management Program over the course of the next five years.

Achievement of the goals will result from a unified effort using many tools available to those involved with the abatement of nonpoint source 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. Restoration activities generally include: technical and financial assistance as well as Best Management Practice (BMP) implementation, operation, and maintenance. In Pennsylvania, certain entities or partners are responsible for only one of these activities, while others are engaged in many of these activities.

Successful achievement of the goals outlined below will only be realized if many partners successfully collaborate and focus on the achievement of the 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, county conservation districts (CCDs), state government entities, and federal government entities. The successful achievement of the goals outlined in this NPS Management 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 NPS Management Plan will help guide the water resource protection and restoration efforts of Pennsylvania's environmental protection partnership. This NPS Management 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 resources.

III. Goals, Objectives, Strategies

A detailed matrix showing the goals, objectives and strategies of this NPS Management Plan can be found in Appendix A. Below is a brief list of the goals:

A. Goals

1) **Goal 1:**
Improve and protect the waters of the Commonwealth from nonpoint source pollution associated with acid mine drainage (AMD) 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 runoff, 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.

6) **Goal 6:**
Develop and update watershed plans leading to the improvement and protection of the waters of the Commonwealth from nonpoint source pollution.

B. Objectives and Strategies

Pennsylvania's NPS Management 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. The NPS Management 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 nonpoint source pollution.

This NPS Management Plan establishes environmental and programmatic indicators of success. The environmental results will be measured by water quality improvements, nonpoint source 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. The NPS Management Plan establishes 70 objectives that can be quantified or measured and progress on reaching the goals established in these objectives will be evaluated each year in the Nonpoint Source Management Program Annual Report submitted by DEP to EPA. The objectives of the NPS Management Plan address nonpoint source pollution across Pennsylvania and are supportive of the goals established in the Pennsylvania Watershed Implementation Plan (WIP) for the Chesapeake Bay.

Quantification of certain activities, such as public education, awareness and action, is challenging; however, those activities are considered by Pennsylvania to be critical to the success of the NPS Management Plan.

Goal 1: Improve and protect the waters of the Commonwealth from nonpoint source pollution associated with 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 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 Operation and Maintenance (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 government employees as well as to others involved with the O&M of --privately-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. The Bureau of Abandoned Mine Reclamation (BAMR) uses funding from 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. This is done through Government Financed Construction Contracts, Re-mining permits and Bond Forfeiture Reclamation. Growing Greener, Section 319 and Commonwealth Financing Authority (CFA) grants can also be used for reclamation activities.

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

Watershed groups, counties, municipalities, CCDs and other non-profit conservation minded groups can obtain funding from Growing Greener, Section 319, 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 "Alternative Bonding System (ABS) Legacy Sites." If a specific project is in a Qualified Hydrologic Unit then the entity can apply for AMD Set-Aside funds. Also, BAMR will use some of this funding for construction of treatment systems. Every year the Eastern Pennsylvania Coalition for Abandoned Mine Reclamation (EPCAMR) and Western Pennsylvania Coalition for Abandoned Mine Reclamation (WPCAMR) provide a conference for both government and non-profits groups to exchange ideas on the best treatment options.

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

WPCAMR will continue to apply for Growing Greener funds to administer the Quick Response program. They will continue to partner with other entities that can provide match funds for the projects. BAMR will continue to serve as the advisor to the Quick Response program.

1.5 Provide engineering assistance under the Technical Assistance Grant for one AMD project each year for the next five years.

The Engineering Assistance Program, through the Technical Assistance Grant, will continue to provide statewide engineering and soils technical assistance to entities developing or implementing a watershed assessment, watershed restoration plan, or watershed protection plan involving AMD.

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

Abandoned wells with no responsible party are addressed by the Well Plugging Program administered by the Office of Oil and Gas Management.

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

The reduction of iron from the waters of the Commonwealth is a collaborative effort by all entities engaged in the abatement of AMD. DEP, in association with the Department of the Interior's Office of Surface Mining Reclamation and Enforcement (OSMRE), watershed groups, CCDs, 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, CFA, PENNVEST and SMCRA funding sources. Watershed Restoration Plans, WIPs, 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 new AMD treatment systems, an additional 5,000 pounds of aluminum will be reduced from the nonpoint 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 OSMRE, watershed groups, CCDs, 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, CFA, PENNVEST and SMCRA funding sources. Watershed Restoration Plans, WIPs, Qualified Hydrologic Unit Plans, and other plans will be followed so priorities can be addressed.

1.9 Through load-reduction efforts with the installation of new AMD treatment systems, an additional 80,000 pounds of acidity will be reduced from the nonpoint 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 OSMRE, watershed groups, CCDs, 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, CFA, PENNVEST and SMCRA funding sources. Watershed Restoration Plans, WIPs, Qualified Hydrologic Unit Plans, and other plans will be followed so priorities can be addressed.

1.10 Through load-reduction efforts with the current operational passive treatment systems, 15,000,000 pounds of iron will continue to be reduced from the nonpoint 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 OSMRE, watershed groups, CCDs, 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, CFA, PENNVEST, and SMCRA funding sources.

1.11 Through load-reduction efforts with the current operational passive treatment systems, 2,500,000 pounds of aluminum will continue to be reduced from the nonpoint 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 OSMRE, watershed groups, CCDs, 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, CFA, PENNVEST, and SMCRA funding sources.

1.12 Through load-reduction efforts with the current operational passive treatment systems, 15,000,000 pounds of acidity will continue to be reduced from the nonpoint 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 OSMRE, watershed groups, CCDs, 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, CFA, PENNVEST, and SMCRA funding sources.

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

DEP's BAMR is responsible for active treatment 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.

1.14 Through load-reduction efforts with state operated active treatment systems, 175,000 pounds of aluminum will continue to be reduced from the nonpoint source pollutant stream each year.

DEP's BAMR is responsible for active treatment plants that are providing the continued reduction of aluminum from the waters of the Commonwealth. AMD Set-Aside funds will be used to provide OM&R activities to continue to remove aluminum as a pollutant from the water resource.

1.15 Through load-reduction efforts with state operated active treatment systems, 2,500,000 pounds of acidity will continue to be reduced from the nonpoint source pollutant stream each year.

DEP's BAMR is responsible for active treatment 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.

1.16 Through load-reduction efforts with state operated active and passive treatment systems, 10 billion gallons per year (BGY) of water will be treated reducing nonpoint source pollutant entering waters of the Commonwealth each year.

DEP's BAMR is responsible for nine active treatment plants and 46 passive treatment systems that are treating 10 BGY of AMD affected water. AMD Set-Aside funds will be used to provide OM&R activities to continue to treat the water.

1.17 Provide technical assistance under the Technical Assistance Grant for 15 AMD projects each year for the next five years.

Continue to administer an AMD Technical Assistance Program with funding from Growing Greener to provide free assistance to watershed groups, CCDs, and others with a variety of AMD projects. This assistance has allowed watershed organizations to obtain grants to move forward with full-scale AMD watershed assessments or implementation of AMD remediation projects.

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 BMPs on 30 agricultural operations per year using state directed funds. These BMPs will be for the mitigation of soil loss and/or nutrient management.

A variety 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, the State Conservation Commission (SCC), Pennsylvania Association of Conservation Districts (PACD), CCDs, and certain watershed associations will partner to provide technical and financial assistance to farmers to perform work such as barnyard stabilization, streambank stabilization, installation of manure storage

facilities, and installation of other conservation practices (waterways, terraces and other similar practices).

2.2 Support the review of 30 Nutrient Credit total trades documenting the purchase of nutrient and/or sediment credits annually.

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

2.3 Conduct 2,000 agricultural compliance inspections on farms in the Chesapeake Bay Watershed each year.

Beginning in 2016, DEP began an enhanced agriculture compliance inspection program of farms within the Chesapeake Bay Watershed. Pennsylvania, through a collaborative effort between the DEP and participating CCDs, will continue to inspect farmers using staffing resources coming from the participating conservation districts and DEP regional office staff.

2.4 Provide six full-time equivalents (FTEs) under a Technical Assistance Grant for designing and installing Agricultural BMPs.

The Engineering Technical Assistance Grant program, in conjunction with the Natural Resources Conservation Service (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, CCDs, 501(c)3 non-profit organizations, municipalities, and educational institutions. The purpose of this grant is to provide high level engineering technical assistance to develop or implement a watershed assessment, watershed restoration plan, watershed protection plan, conservation plan or comprehensive nutrient management plan (NMP).

2.5 Support a minimum of 32 Chesapeake Bay Program Agricultural Technicians and eight Agricultural Engineers in the Chesapeake Bay watershed each year for the next five years.

Technicians and engineers employed by the CCDs perform a variety of necessary and effective work to limit soil loss and the improper use of nutrients on farms. Pennsylvania, through the implementation of the Chesapeake Bay Program, will continue to support these technicians and engineers.

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

Pennsylvania recognizes the significant progress that can be made in addressing nonpoint source pollution through the use and encouragement of innovative technologies and practices. Pennsylvania facilitates discussions and encourages support where possible, for the implementation of these types of activities throughout the Commonwealth. Recent funding reductions to state programs have slowed down the rate of implementation of innovative technologies. 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.

2.7 Support the certification of 500 certified manure haulers within the Commonwealth annually.

Created under the Commercial Manure Hauler and Broker Certification Act, (Act 49, 3 P.S. Section§ 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. This certification program ensures that 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.

2.8 Support the certification of 200 certified Nutrient Management Specialists within the Commonwealth annually.

Created under the Nutrient Management and Odor Management Act, (Act 38), 3 Pa. C.S.A. Section§ 501-522, the Nutrient Management Program, administered by the SCC, requires certain agricultural operations to develop a Nutrient Management Plan (NMP) following nutrient management planning criterion established under Act 38. Act 38 requires that a trained and certified Nutrient Management Specialist develop the NMP to ensure that farm-specific NMPs 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 NMPs.

2.9 Maintain the implementation of approved Act 38 NMPs on 200,000 acres of farmland regulated as Concentrated Animal Operations (CAOs) and Concentrated Animal Feeding Operations (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 NMP. This required planning integrates the selected manure, fertilizer, and green manure crop management options into a NMP that has a one to three-year lifespan. The NMP, 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 NMP implementation represents the day-to-day activities carried out by the farmer to execute the decisions made in the NMP. CCDs and DEP assess the farmers' actions to implement the NMP 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 NMPs 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.

2.10 Support 750,000 acres of non-CAO/non-CAFO farmed acres under a Nutrient Management Plan or Manure Management Plan over the next five years.

In association with the 319 Program's goal of establishing a framework to track NMPs and Manure Management Plans (MMPs) developed for farms not regulated as CAOs or CAFOs, Pennsylvania, through the DEP, initiated the Chesapeake Bay enhanced farm inspection program. Through the data collected after the first year of implementation of that program (ending June 2017), DEP documented that a total of 200,000 acres of non-CAO, non-CAFO farmland are covered under an NMP or MMP. DEP will continue to track new farm inspections being carried out which is expected to result in documenting support of 750,000 acres of non-CAO/non-CAFO farm acres under an NMP or MMP over the next five years.

2.11 Continue to encourage the use of the PA One Stop program to increase the number of fields entered into that system 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 (PSU). 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 Agricultural Erosion and Sediment (E&S) Control Plan or MMP. 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, CCDs, and NRCS).

2.12 Provide engineering assistance under the PACD Engineering Technical Assistance Grant (TAG) for 35 Agricultural projects each year for the next five years.

Continue to operate the TAG Program to provide statewide engineering and soils technical assistance to entities involved with the development or implementation of agricultural watershed assessments, watershed restoration plans, or watershed protection plans.

2.13 Continue to implement PA's Chesapeake Bay WIP over the next five years.

The Chesapeake Bay Phase 3 WIP, progress and goals can be found at: www.dep.pa.gov/chesapeakebay/phase3.

Goal 3: Improve and protect the waters of the Commonwealth from nonpoint source pollution associated with stormwater runoff, as well as streambank and shoreline degradation.

Objectives and strategies to accomplish Goal 3:

3.1 Conduct 500 site inspections under Chapter 105 Water Obstruction and Encroachment Permitting (Chapter 105) and 8,000 site inspections for Chapter 102 Erosion and Sediment Control Program and National Pollutant Discharge Elimination System Permitting (Chapter 102) Programs annually for the next five years.

Pennsylvania, through the implementation of the Chapter 102 and Chapter 105 programs, will conduct 500 Chapter 105 inspections and 8,000 Chapter 102 inspections on earth disturbance sites each year for the next five years. These inspections may be carried out by employees of delegated CCDs. These inspections may be routine partial inspections,

follow-up inspections, response to complaints received by DEP or delegated CCDs 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 nonpoint source 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.

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. For the current five-year MS4 permit cycle, municipalities are required to develop a Pollutant Reduction Plan to reduce the amount of pollutants (sediment and nutrients) being discharged from their MS4.

DEPs Bureau of Clean Water (BCW) is responsible for the oversight of this program. As of 1/1/2019, DEP has issued 308 MS4 permits and approved 289 Pollutant Reduction Plans. Review of annual MS4 reports and facility inspections are conducted by DEP regional offices to determine compliance with permit requirements. The link below will provide additional information on this program.

The BCW has and will continue to also support Chesapeake Bay WIP development and implementation, including contributions from MS4.

https://www.dep.pa.gov/Business/Water/CleanWater/StormwaterMgmt/Stormwater/Pages/default.aspx

3.3 Implement five new green infrastructure/volume reduction/flood hazard mitigation projects over the next five years.

Green infrastructure/volume reduction/flood hazard mitigation projects are implemented by several partners including state and local government agencies along with federal partners and universities. Pennsylvania will address these issues through grants and partnering to implement five projects that include green infrastructure or work along floodplains to remediate stormwater and flooding issues over the next five years.

3.4 Implement 30 new, state-funded riparian buffer, stream restoration and/or stormwater management projects annually for the next five years.

Stream restoration projects are implemented by several 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 30 new riparian buffer, stream restoration and/or stormwater projects per year for the next five years through the dissemination of funds and partnering. Pennsylvania will encourage these projects through education and outreach (E&O) efforts, permitting, collaboration with CCDs, implementation of WIPs, and other such efforts.

3.5 Address 350 new Dirt, Gravel, and Low Volume (DGLV) Road projects each year for the next five years.

Through the continued implementation of the DGLV Road program, which includes partnering with local government entities, CCDs, and DEP, Pennsylvania will continue to address nonpoint source pollution originating from DGLV roads. This program includes

a significant education and outreach program (e.g. Environmentally Sensitive Maintenance Training), technological developments (e.g. use of driving surface aggregate 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 streambank stabilization and stream restoration projects. Many partners are involved with stream improvement projects. Such partners include: Fish and Boat Commission, Pennsylvania Department of Conservation and Natural Resources (DCNR), numerous watershed associations, NGOs, the DEP, CCDs, 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 Conservation Reserve Enhancement Program (CREP) program over next five years.

CREP is a program requiring the involvement of local, state and federal partners. This program involves the leveraging of federal funds and coordination between NRCS, CCDs, 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 2,500 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 500 acres of new riparian forest buffer each year for the next five years. In addition, through the implementation of these programs, many existing and unaccounted forested riparian acres will be preserved.

3.9 Develop 30 new forest stewardship plans each year that cover approximately 5,000 acres of privately-owned forest land over 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 over the next five years.

TreeVitalize continues to be an active and vital program in Pennsylvania's plan to address nonpoint source pollution. Through the efforts of those involved with this program, thousands of trees will be planted near streams and creeks as well as in parks and along community streets throughout the state. Streamside trees provide shade and mitigate thermal pollution, while decreasing stormwater volume and the destabilization of stream banks. Community street and park trees intercept rainfall, increase soil infiltration and subsequent ground water recharge, while reducing the volume and rate of stormwater runoff.

3.11 Encourage nonpoint source pollution control activities within United States Forest Service (USFS) 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 recategorized 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) watersheds. The nonpoint source pollution issues of concern include habitat fragmentation due to passage barriers (culvert crossings), lack of sufficient large wood in streams, non-native plants, low pH water quality levels, and sedimentation from stream crossings and other sources.

3.12 Provide engineering assistance under the Technical Assistance Grant for 4 Stream Restoration Projects each year for the next five years.

The Engineering Assistance Program will continue to provide statewide engineering and soils technical assistance to entities developing or implementing agricultural watershed assessments, watershed restoration plans, or watershed protection plans.

3.13 Provide technical assistance under the Technical Assistance Grant for 15 nonpoint source projects each year for the next five years.

Continue to administer a Technical Assistance program with funding from Growing Greener that supports CCDs, watershed organizations, Trout Unlimited chapters, and other Growing Greener eligible entities to address nonpoint source pollution in the Chesapeake Bay watershed of Pennsylvania. This includes streambank stabilization and habitat projects.

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 Continue to collect BMP data at the state, watershed and sub-watershed level.

PracticeKeeper, a product designed for CCDs, state and local partners to track the planning and implementation of BMPs, is currently being used to track BMPs statewide. The BMP Module of the PracticeKeeper System tracks spatially-located sediment and nutrient reducing BMPs that are planned and/or implemented in Pennsylvania. The BMPs may be related to Agriculture Erosion and Sediment Control Plans (E&S Plans), NMPs, MMPs, Watershed Plans, Agriculture Inspections, E&S Plans, or as standalone BMPs.

The PracticeKeeper program contains features including Microsoft Office reporting, web-based mapping tools and document management capabilities resulting in time savings to create, edit or report on common plans that include BMPs. BMPs will continue to be tracked using PracticeKeeper.

4.2 Further develop and maintain PA One Stop to allow the NPS Management 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 associated BMPs that could 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 Sediment Control and Manure Management regulations. Tracking the implementation of this planning tool will support the Commonwealth's efforts to demonstrate industry compliance with environmental regulations.

4.3 Continue to develop and improve our Reclaimed Abandoned Mine Land Inventory System (RAMLIS) Geographic Information System (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 maintained by BAMR and used in the updated version.

4.4 Ensure that the Datashed GIS web tool adequately describes available information relating to the approximate 250 AMD Treatment System 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, Stream Restoration Inc., to ensure the site is 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), the DEP will perform a combined total of 6,000 water quality samples and surveys 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 WQN. The WQN is a network of monitoring sites focused on biology, pathogens, chemistry or physical habitat characteristics. The WQN is composed of approximately 178 sites. To further bolster the monitoring and data collection efforts of Pennsylvania, DEP contracts with the Susquehanna River Basin Commission (SRBC) and the United States Geological Survey (USGS) to collect water chemistry data as part of the WQN monitoring. In total, over 6,000 water quality samples and surveys are conducted on 1,100 sites annually.

4.6 In addition to other monitoring efforts, the DEP will monitor 30 lakes each year for the next five years.

DEP's Lake Water Quality Monitoring (LWQM) sites are selected in five year rounds to assess mainly public water resources across the Commonwealth. The current 2016 through -2020 round includes 15 lakes. Another 12 lakes were targeted in 2019 for seasonal sampling for evaluating Trophic State Index. The LWQM will continue in 2021 with a minimum of 15 public lakes, with the six DEP Regions targeting an additional 2 to 3 lakes each year (about 18 total) for trophic state analysis. DEP also partners with

several CCDs to sample lakes in their county. DEP trains those CCD personnel and supports the lab analyses through the 319 Program. Any lakes that have restoration projects in the watershed or the lake proper are targeted to determine efficacy of the BMP and possible delisting from the CWA Section 303(d) impairment list. The lake assessments include water quality to both assess trophic state and evaluate potable water. Pathogen and macrophyte conditions in lakes are also incorporated to evaluate recreational uses. These assessments are accomplished by rounds of bacteria sampling according to Chapter 93 of Title 25 of the Pennsylvania Code (Chapter 93) *standards and by assessing macrophyte type, water column density and percent area covered. The data obtained helps direct resource protection and restoration efforts and is used to report lake status in the bi-annual Integrated Report.*

4.7 Through monitoring and assessment efforts conducted by the DEP, over the next five years, 400 miles of streams previously impacted by nonpoint source pollution related causes shall be documented as newly delisted from Category 5 and/or Category 4a in the bi-annual Integrated Report.

Pennsylvania's NPS Management Program partners implement restoration initiatives throughout Pennsylvania to improve water quality and restore our impaired stream reaches. DEP is notified by CCDs and many other NPS Management Program partners when they have observed conditions or performed preliminary testing that leads them to believe that the stream reach is no longer impaired or is significantly improved. At that time, and as resources permit, DEP dispatches biologists 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 Integrated Report.

4.8 Through monitoring and assessment efforts conducted by the DEP, over the next five years, 900 lake acres previously impacted by nonpoint source pollution related causes shall be documented as newly delisted from Category 5 or Category 4a over the next five years.

Pennsylvania's NPS Management Program partners throughout the Commonwealth implement restoration initiatives in order to improve water quality and restore our impaired lakes. DEP is notified by CCDs and many other NPS Management Program partners when conditions or preliminary testing indicates improvement in key parameters like total phosphorus or overall TSI scores indicating lake water quality is significantly improved. Delisting a lake from the CWA Section 303(d) impairment list involves collecting at least as much new data of the same type as was used to impair it. The updated assessment is then reflected in attainment status of the lake in the next publication of the Integrated 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 Management Program funds, to monitor the impacts of BMPs implemented under the United States Department of Agriculture (USDA) National Water Quality Initiative (NWQI). This effort allows the Commonwealth to measure the effectiveness of BMPs 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, to document the improvements associated with the implementation of these practices.

4.10 Continue to input all monitoring data collected by DEP's NPS Management Program into the Water Quality Exchange (WQX) System.

The WQX system is an online database maintained by the EPA for storing and sharing water quality, biological, and physical data. The WQX system can be used by state environmental agencies, federal agencies, universities and private citizens. Pennsylvania's NPS Management Program collects data relating to water quality on priority streams and lakes throughout the Commonwealth. NPS Management Program staff will input the data into WQX which provides other partners with reasonable access to that information.

4.11 Through state-wide nonpoint source pollutant load-reduction efforts, 1 million pounds of nitrogen will be reduced from the nonpoint source pollutant stream each year.

The NPS Management Program will collect statewide aggregated BMP data annually from over 15 state and federal programs supporting the implementation of BMPs throughout the Commonwealth and provide associated annualized load reductions.

4.12 Through state-wide load-reduction efforts, 300,000 pounds of phosphorus will be reduced from the nonpoint source pollutant stream each year.

The NPS Management Program will collect statewide aggregated BMP data annually from over 15 state and federal programs supporting the implementation of BMPs throughout the Commonwealth and provide associated annualized load reductions.

4.13 Through statewide load-reduction efforts, 200,000 tons of sediment will be reduced from the nonpoint source pollutant stream each year.

The NPS Management Program will collect statewide aggregated BMP data annually from over 15 state and federal programs supporting the implementation of BMPs throughout the Commonwealth and provide associated annualized load reductions.

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 management (PCSM), agricultural activities and disturbance activities adjacent to, or within streams. Additional regulatory oversight also occurs on special protection waters. These regulatory programs are continually being refined to better address the changing nature of the industries associated with these activities. As part of the 2016 Chesapeake Bay Restoration Plan, DEP has implemented initiatives including the Chesapeake Bay Agricultural Inspection Program to ensure that all agricultural operations within the Chesapeake Bay Watershed are aware of and meeting their statutory obligations.

4.15 Complete the development and maintenance of DEP's data collection framework by which information regarding the status of NMPs and MMPs on non-CAO/non-CAFO farms. Data is collected and counted using acres covered or farms planned.

Pennsylvania requires all livestock farms and farms using manure as a nutrient source, to obtain either an NMP or MMP depending on specific factors of the agricultural operation. This includes farms that do not fall into the category of a CAO or CAFO. DEP will continue to develop a GIS-based data collection process (PracticeKeeper). This geo-referenced database is being used to collect acreage under NMP/MMP's for non-CAO/non-CAFO farms. Work will continue on the development and full implementation of this data collection and reporting program.

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

Pennsylvania will continue to implement the regulatory program (including permitting and inspections) for the beneficial reuse of sewage sludge (biosolids. Applicants maximize the beneficial use of biosolids by land application pursuant to DEP's Bureau of Waste Management Municipal Waste regulations. Submitted annual reports include monitoring and reporting information. Not all types of biosolids quantities are reported to the DEP, so the total amount of biosolids land applied is not known. DEP's Bureau of Clean Water compiles and maintains a spreadsheet of the amounts reported annually.

4.17 Document farmer compliance with agricultural erosion and sediment control and manure management regulations in the Chesapeake Bay watershed by augmenting the long-standing Act 38 and CAFO inspection programs with the Chesapeake Bay enhanced inspection program addressing the non-CAO/non-CAFO farms, inspecting 5% of the farmlands in the watershed annually until all acres have been assessed.

As DEP continues to collaborate with the agricultural community and the various partners engaged in resource conservation on agricultural operations, DEP will assess and document farmer compliance with the Commonwealth's erosion and sediment control and nutrient management regulations in the Chesapeake Bay watershed.

Goal 5: Demonstrate Pennsylvania's nonpoint source 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 nonpoint source pollution abatement efforts outlining the major accomplishments of Pennsylvania's NPS Management Program consistent with EPA reporting guidelines.

By February 15th of each year, DEP will, with the assistance of many NPS Management Program partners, prepare a draft annual report describing the reported major accomplishments of the NPS Management 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 Report. It is understood that the NPS Management Program annual report will not be comprehensive. The amount of BMPs constructed and other projects implemented in Pennsylvania is too great.

Regardless, this annual report will include all accounted for load reductions as well as certain notable efforts to address and mitigate nonpoint source pollutants.

5.2 Develop two "Success Stories" per year.

Pennsylvania DEP, watershed associations, CCDs, 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 nonpoint source pollutant load reduction and resource protection and restoration efforts. These "Success Stories" will be reported 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 10 approved WIPs per year

As part of the Annual Report, the DEP will provide a detailed report on the progress of achieving implementation of at least 10 of the priority watersheds with watershed-based plans currently approved by EPA in Pennsylvania.

5.4 Biannually submit to EPA the requisite "Semi-Annual Performance Report"

Pennsylvania will continue to report semi-annually (due dates February 1st and August 1st) on the progress the Commonwealth is making in implementing the active projects within the approved Section 319 grant work plans. The program staff at DEP will continue to input the required project reports into the Grants Reporting and Tracking System (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.

5.5 DEP will continue to input current information in the Watershed Plan Tracker throughout the five-year life of this NPS Management Plan to ensure accuracy of data.

Pennsylvania continues to input current information in 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 WIPs and Total Maximum Daily Load (TMDLs). DEP will continue to dedicate staff to support this effort and participate in regional and national meetings associated with this effort.

Goal 6: Develop and update watershed plans leading to the improvement and protection of the waters of the Commonwealth from nonpoint source pollution.

Objectives and strategies to accomplish Goal 6:

6.1 Develop three new nonpoint source WIPs over the next five years.

Pennsylvania will work with interested partners and watershed groups to assist in the development of five new WIPs within watersheds ranging in size between two to ten square miles. The WIPs will incorporate the nine elements of a WIP and address nonpoint source pollution.

6.2 Update three existing WIPs over the next five years.

Pennsylvania will work with interested partners and watershed groups to assist in the update of five existing WIPs. The WIPs will incorporate the nine elements of a watershed plan and address nonpoint source pollution.

6.3 Perform a detailed review of all current WIPs and close those no longer deemed appropriate for consideration.

Pennsylvania will collaborate with program partners; review the current roster of WIP watersheds and determine which WIP watersheds are no longer appropriate for consideration of federal funding. Metrics used to guide this decision making process will include, but not be limited to: inappropriate watershed size, loss or lack of local partner interest, and changes in watershed characteristics.

C. Measurable Objectives to Address Goals

The primary reporting and tracking methodology used for recording activities in Pennsylvania for tracking accomplishments under the NPS Management Program is the GRTS maintained by the EPA and the states participating in the NPS Management Program. Participating states enter information on each project carried out under the NPS Management 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 allows states to report on several aspects of nonpoint source pollution abatement associated with NPS Management Program projects, including environmental results, project and grant data, nonpoint source pollutant load reductions, and utilization of Section 319 NPS Management 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 NPS Management Program.

In accordance with EPA Region 3 guidance for the 319 Program, Pennsylvania reports current progress in reducing sediment, nutrient, acidity, and metals loads to surface waters where NPS Management 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 Management Program related pollution management efforts in Pennsylvania.

Data is entered and maintained in GRTS by the DEP's Office of Water Resources Planning, Watershed Support Section. Data produced by GRTS as well as the associated EPA Watershed Plan Tracker (WPT) tool 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, 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 nonpoint source pollution management. The center octagon represents the concert of state agencies involved with nonpoint source pollution abatement. For clarity, education institutions may be considered commensurate with NGOs.

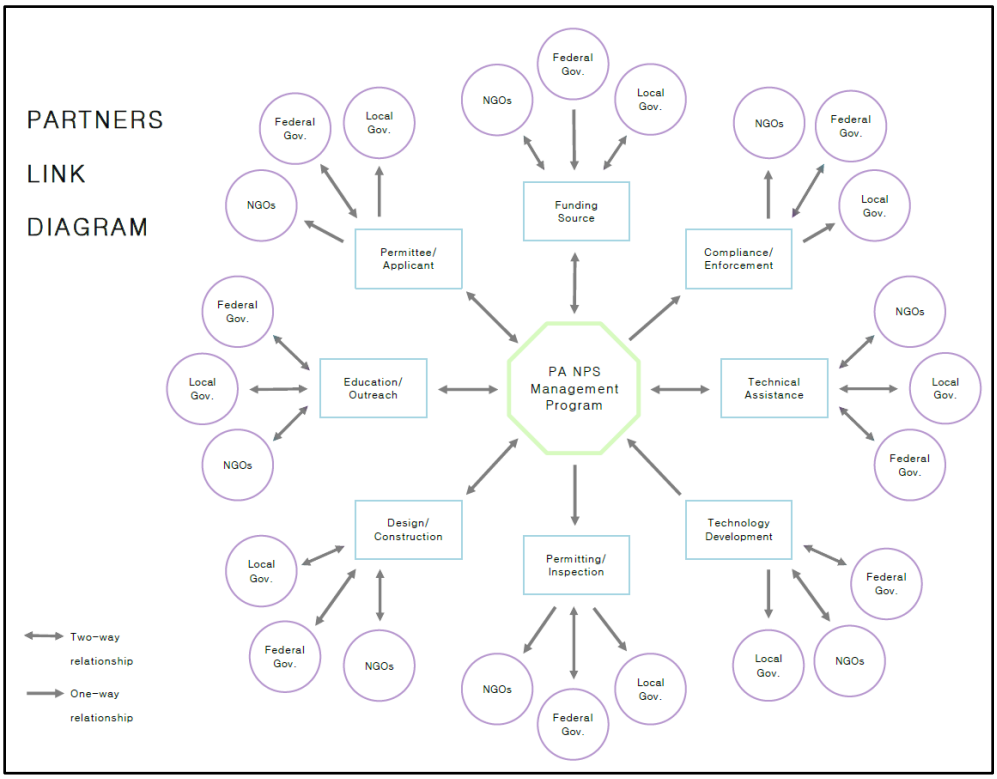


Figure 4 above is one of many ways in which the partnering web can be depicted. In this figure, the PA NPS Management Program is placed in the center. That hub broadly represents the activities of DEP and other state agencies. It could be just as beneficial to place nonpoint source pollution as the hub 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. Each of the partner-types are connected to each other and Pennsylvania's NPS Management Program through certain functional areas, responsibilities or abilities.

Table 3: An abridged list of partners engaged in the work of nonpoint source 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.

Nonpoint 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				
U.S. 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		
U.S. Forest Service	Federal	X	X		X	X	X	X
National Oceanic and Atmospheric Administration	Federal	X	X		X		X	
U.S. Geological Survey	Federal	X	X		X		X	X
U.S. 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
PA Department of Community and Economic Development	State	X	X	X				
PA Department 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
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

	Type	E&O	Technical Assistance	Financial Assistance	Monitoring	Compliance / Enforcement	R&D	BMP IMP
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
Environment Erie	NGO	X	X	X	X			X
PA Lake Management Society	NGO	X	X		X		X	
Trout Unlimited, Inc.	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

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 existence 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 nonpoint source pollution. There are over 2,500 municipalities (not including counties) in Pennsylvania. Each municipality is a potential partner in the control of nonpoint 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 to implement projects for the betterment of our water resources by addressing nonpoint source 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.

CCDs are a unique member of the “local government” set at the county level. CCDs 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 source pollution. CCDs provide citizens a local office through which soil and water resource conservation services can be obtained. In Pennsylvania, the 66 CCDs function uniquely for the purpose of protecting and assisting citizens in protecting the soil and water resource. CCDs engage in a multitude of programs, projects, and other activities focused on the management of nonpoint source pollution. While each CCD is unique, and tailors their activities

to the needs of their particular county, most CCDs share at least three general functions. CCDs function as regulator, grantee, and educator. As regulator, CCDs implement permitting and inspection services, as grantees, CCDs receive grant funds and implement restoration projects with those funds, and as educator, CCDs 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 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 several 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.

www.agriculture.pa.gov

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 nonpoint 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 nonpoint source pollution. Further, PennDOT is a partner in the effort to abate nonpoint source 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 nonpoint source pollutants.

www.penndot.gov

3. Department of Conservation and 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 nonpoint source pollution; those features include impervious surface, tillable land, and DGLV roads among other features. 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 PA.

DCNR also provides extensive education and outreach to private forest landowners, municipalities, and citizen organizations on nonpoint source pollution issues as well as other topics of environmental concern. DCNR routinely engages in nonpoint source pollution mitigation projects including trail, bank, and shoreline stabilization projects and community tree planting and maintenance efforts to reduce urban stormwater runoff.

www.dcnr.pa.gov

4. Fish and Boat Commission

The Pennsylvania Fish and Boat Commission (PFBC) has the responsibility of managing the Commonwealth's fisheries. As such, this agency manages lakes, rivers, and streams to maintain healthy fish populations. To accomplish this goal, PFBC 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, PFBC engages in bank and shoreline stabilization projects oftentimes in association with fish habitat improvement projects. PFBC also engages in nonpoint source pollution BMP installation such as the installation of floating wetlands on public lakes.

www.fishandboat.com

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 trapping 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 DGLV roads, and administrative and management buildings. Given the quantity of land managed by the PGC, this entity is a logical partner in the task of managing nonpoint source pollution.

www.pgc.pa.gov

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 NPS Management 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 to accomplish this mission. Among those programs is the responsibility to administer major provisions of the state's Clean Streams Law and the federal CWA. DEP's Office of Water Programs plans, directs, and coordinates departmental programs associated with the management and protection of the Commonwealth's 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 stormwater and nonpoint source pollution. In addition, the Office of Water Programs also coordinates the planning, design, and construction of flood protection and stream improvement projects.

www.dep.pa.gov

7. 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 SCC is a departmental administrative commission under the concurrent authority of DEP and PDA. The commission provides support and oversight to the state's 66 CCDs for the implementation of conservation programs such as: the Nutrient Management and Odor Management Program, the DGLV 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.

www.agriculture.pa.gov

8. PENNVEST

The Pennsylvania Infrastructure Investment Authority (PENNVEST) provides financing for drinking water, waste water, nonpoint source pollution prevention, and stormwater capital improvement projects throughout the Commonwealth. Limited supplemental grant capacity is available based upon the community's capacity to handle debt service. 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 and administers those federal funds as well as some state sourced money for needed infrastructure improvements. Any owner/operator pursuing a water quality improvement project, both public and private entities, are eligible for consideration for funding. Since the program began, over 3,800 projects have been approved funding $8.7 billion for infrastructure improvements. nonpoint source pollution prevention projects, including Agricultural BMPs, Acid Mine Drainage and Brownfield remediation, and Stormwater and Homeowner On-Lot projects, represent 1,127 of the approvals equal to over $472 million invested in these water quality projects.

www.PENNVEST.pa.gov

9. Pennsylvania Emergency Management Agency

The Pennsylvania Emergency Management Agency (PEMA) assists communities and citizens in preparing for, responding to and recovering from emergencies including natural disasters, terrorism and manmade disasters. PEMA supports county emergency management agencies by coordinating federal, state, and local partners.

The PA Emergency Management Council establishes statewide policy for the emergency management program. The Council includes the governor, lieutenant governor, secretaries of various state departments with emergency response capabilities, General Assembly leadership, representatives of county and municipal government, labor, business and industry, and the private sector. The council meets three times a year and within 72 hours after a disaster emergency declaration.

www.pema.pa.gov

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 nonpoint source pollution abatement, DEP works with the EPA, OSMRE, and NRCS. Any information made available to DEP from federal agencies that directly relates to nonpoint source 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 EPA maintains an office in Philadelphia and provides the Commonwealth with a variety of services, including funding and guidance for a variety of projects such as nonpoint source 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 Naval Support Activity Mechanicsburg are examples of the Federal presence in Pennsylvania, each of which are part of the Department of Defense (DOD). DOD installations such as military bases represent a significant amount of land on which green infrastructure could be constructed. In some cases, such as the Navy Base in Mechanicsburg, GI has been constructed on these facilities. DOD controlled sites represent an under-utilized potential partner in the fight against NPS pollution. Complementing the military presence found at military installations, the DOD through the Department of the Army under the flag of the US Army Corps of engineers maintains an active presence in Pennsylvania both as a landowner maintain recreation lands and as a regulator overseeing activities that may impact wetlands. The USACE has been a partner of DEP providing education and training on topics such as wetland identification for many years.

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 U.S. 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

The USDA operates extensively in Pennsylvania under the flag of several different entities. NRCS, the USFS and the Farm Service Agency (FSA) are examples of USDA agencies that work very closely with PA DEP on nonpoint source pollution 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, implements easement programs and other programs.

The FSA oversees several voluntary conservation-related programs that work to address various 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: 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 OSMRE and the United States National Park Service (USNPS). OSMRE works closely with the BAMR focusing on AMD reclamation and therefore, the abatement of nonpoint source pollution. Reportable work performed by OSMRE is accounted for with the WPT tool.

6. Federal Emergency Management Agency

The Federal Emergency Management Agency (FEMA) coordinates the federal government's role in preparation, prevention, mitigation of effects, and response to and recovery from all domestic disasters including natural, manmade, and acts of terrorism. FEMA assists with response and recovery by providing financial assistance as well as coordination. The agency specifically coordinates responses among various federal government agencies and local and state agencies. Also, U.S. presidents can declare Presidential disaster declarations which requires FEMA response.

www.fema.gov/about-agency

D. Non-profit Organizations and Citizen Groups

Pennsylvania is fortunate to have significant involvement from non-profit groups and other NGOs in the effort to address nonpoint source pollution. Over the past several decades, the challenge of curtailing nonpoint source pollution and improving the water resource in Pennsylvania has benefitted from this involvement. The continued effort of these groups in providing: education and outreach, BMP implementation and maintenance, project coordination, and other similar efforts is a vital and foundational aspect of the NPS Management Plan.

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 in very rural areas, others are in 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 nonpoint source pollution management. Some of those institutions do directly engage in research that furthers the work of nonpoint source pollution management such as the stormwater management research being done at Villanova University, while others are more on the periphery. Most, if not all, of the colleges and universities in Pennsylvania offer sites on which nonpoint source pollution could be addressed.

V. Programs and Program Areas

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. Each of these programs provide time, money, and other resources to the management of nonpoint source 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 provides 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 two to ten square mile watersheds 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. (plans need to meet EPA's nine elements of a watershed protection plan.) https://www.epa.gov/sites/production/files/2015-12/documents/watershed_mgmnt_quick_guide.pdf
5. Implementation
6. Monitoring for success

Progress is measured by comparing our implementation efforts to the goals outlined in the NPS Management Plan and is also assessed through monitoring of waterbodies 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 public over the DEP website.

As recommended by the guidance, the following section of this document lists certain program areas in which the NPS Management Program operates. These program areas are in many cases pollutant sources (*e.g.*, construction runoff), 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 nonpoint source pollution within Pennsylvania. This section is further divided between assessment and monitoring programs, restoration focused programs, and regulatory programs, which are protective of existing uses by design. 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 nonpoint source 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. 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 this acidic water encounters. This type of AMD is quite common in the coal producing regions of Pennsylvania.

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 pollution environmental responsibilities. This oversight is accomplished through the permitting and inspection of new oil and gas well site development and operation, implementation of E&S 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.

Mining, oil and gas activities have impaired 5,906 miles of streams.

2. Agriculture

Agriculture is one of Pennsylvania's largest and most productive industries. According to Pennsylvania's 2018 Integrated Report, agriculture is one of the top two sources of nonpoint source pollution impairment in the state. Examples of nonpoint source pollution associated with agriculture include: accelerated soil erosion resulting in discharges of sediment into waterways; and manure-laden runoff resulting in discharges of nutrients into surface and groundwater. DEP's Nonpoint Source Program, as well as other program partners within and outside of the agency, employ techniques and tools to address NPS pollution resulting from poor farming practices. DEP and others utilize grant funding and (federal) cost-share programs to assist farmers with developing requisite plans and implementing essential BMPs.

Agricultural activities have impaired 7,628 miles of streams.

3. Construction Runoff

This nonpoint source 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 waterbodies. Through the implementation of regulatory programs and through partnering among various entities including DEP, PennDOT, CCDs, and the regulated public, Pennsylvania continues to address soil loss and sedimentation issues which may originate from these activities.

Construction activities have impaired 1,354 miles of streams.

4. Hydrologic/Habitat Modification (Urban Runoff)

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. Many of these activities can cause nonpoint source pollution. Since many inorganic and organic pollutants as well as stormwater volume are more commonly associated with certain land use types, as land uses change, so do the pollutants. Land use changes have a causal relationship with other nonpoint source pollution 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.

Activities that modify hydrology/habitat have impaired 6,340 miles of streams.

5. Stream Bank and Shoreline 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.

Activities causing erosion have impaired 1,763 miles of streams.

6. Lakes

Section 314 of the CWA 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. Many Clean Lakes Initiatives are 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 Sections 95.2, 95.7 and 95.8, are being moved, sometimes in modified form, to Chapter 92a. Other portions, including Sections 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 Section 95.6(a) and provides that to control eutrophication in a lake, pond or other impoundment, the DEP 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 DEP 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 nonpoint source 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 CWA. 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, 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 Lake Management Plan. Many of the original Clean Lakes Phase I projects completed in the 1990s are implementing recommended BMPs.

Upstream impoundments on Commonwealth streams have impaired 164 miles of streams.

7. Silviculture

The major nonpoint source 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. Implementation of program activities are shared by DEP and CCDs, 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.

Silviculture activities have impaired 164 miles of streams.

8. Land Disposal

The land disposal category covers several nonpoint sources of pollution, including improper disposal of household hazardous waste (HHW), illegal waste disposal sites, and malfunctioning on-lot sewage treatment systems. Improper disposal of HHW has been shown to cause significant degradation of surface waters and groundwaters. The impact of illegal waste disposal sites, both active and abandoned, on waters of the Commonwealth is still largely undefined. The Bureau of Waste Management administers HHW and illegal waste disposal sites, while the Bureau of Clean Water administers the on-lot sewage treatment system program.

Land disposal activities have impaired 25 miles of streams.

9. Other Nonpoint Source Pollution Category

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

Atmospheric deposition has impaired 525 miles of streams.

10. Healthy Watersheds

Healthy Watersheds provide guidance and tools for watershed protection for state and local programs. The Healthy Watersheds program works to include watershed protection within federal programs and promotes development of state and local programs. Key elements include: the establishment of partnerships to identify and protect healthy waters, the identification of healthy watersheds using scientific and integrated methods; the tracking of healthy watersheds and the protection of healthy watersheds through regulatory and non-regulatory tools. Ultimately, the program should help states meet EPA goals for public health and the environment.

Pennsylvania protects vulnerable watersheds through special protection stream classifications including exceptional value waters (EV) and high-quality waters (HQ).

https://www.epa.gov/hwp/what-epa-doing-healthy-watersheds

Table 4: An abridged listing of programs active within Pennsylvania and focused on the abatement of nonpoint source pollution.

The full listing of programs operated by all partners engaged in nonpoint source pollution abatement in Pennsylvania is too lengthy for inclusion in 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.

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		
DGLV 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

	E&O	Tech. Assist.	Financial Assistance	Monitoring	Information/Data Tracking	Comp./Enf.	R&D	BMP IMP
WPCAMR Quick Response Program		X	X					X
TreeVitalize	X	X	X					X
Master Watershed Steward Program	X	X						X
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 - PATU		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			
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		

B. Assessment, Monitoring, and Prioritization Programs

1. Statewide Surface Water Assessment Program

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 SRBC, the Interstate Commission on the Potomac River Basin (ICPRB), the PFBC, and DEP central office staff. At 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, nonpoint sources of pollution were not well defined and the extent and severity of nonpoint source pollution 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 nonpoint source pollution impacts, lesser known point source impacts, and combined nonpoint source/point source pollution 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 CWA 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 CWA Sections 303(d) and 305(b), which is outlined in Section I.3, above.

The status of Pennsylvania's waters relative to attainment of designated uses is presented in the 2018 Integrated Report 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, or it may be impaired.

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.
- Category 4C: Not impaired by a pollutant.

Category 5: Waters impaired for one or more uses by a pollutant that requires the development of a TMDL.

Category 5alt: Waters impaired for one or more uses by a pollutant that are selected for alternative restoration implementation.

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 CWA Section 303(d) list that EPA approves or disapproves under the CWA. 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.

b. Water Quality Network

The Pennsylvania WQN is a statewide monitoring network with 178 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.

c. Data Collection Protocols

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 nonpoint source pollution 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 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.

More information can be found in DEP's Water Quality Monitoring Protocols for Streams and Rivers, located here:
http://files.dep.state.pa.us/Water/Drinking%20Water%20and%20Facility%20Regulation/WaterQualityPortalFiles/Technical%20Documentation/MONITORING_BOOK.pdf

d. Assessment Methods

With the completion of initial assessments in State Water Plan watersheds, DEP initiated new assessment methods designed to be more robust. This process focuses on biological assessment methods, as well as chemical and physical habitat characterization to establish whether protected uses are impaired or not impaired. Assessments are conducted 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. These more intensive assessment methods, 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 assessment determinations will replace the original SSWAP entries in the Section 305(b) assessment database. Assessment methods

are also 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.

More information can be found in DEP's Assessment Methodology for Rivers and Streams, located here: http://files.dep.state.pa.us/Water/Drinking%20Water%20and%20Facility%20Regulation/WaterQualityPortalFiles/Methodology/2015%20Methodology/Assessment_Book.pdf

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.

2. Groundwater Quality

Major sources of groundwater contamination in Pennsylvania include industrial facilities, underground storage tanks, hazardous waste sites, landfills, waste piles, aboveground storage tanks, surface impoundments, manure/fertilizer applications, chemical facilities, septic systems, acid mine drainage, and abandoned oil and gas wells. 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 goal is to prevent groundwater contamination and protect 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 Summary 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 nonpoint source pollution.

Groundwater monitoring efforts in Pennsylvania were expanded to a Statewide Fixed Station Groundwater Quality Monitoring Network (GWMN) in 2015. The network currently consists of 27 groundwater wells located in 26 counties across the Commonwealth. The GWMN was established to characterize the ambient groundwater quality of Pennsylvania aquifers, monitor changes in groundwater quality, and provide a dataset for assessing seasonal variability and long-term trends in concentrations of analyzed constituents. Wells are sampled twice annually for major ions, trace metals, nutrients, and field readings. During the first sampling event, dissolved hydrocarbon gases, radiological elements, and volatile organic chemicals are also evaluated. Data collected for this project are stored and publicly available in the USGS National Water Information System (NWIS) database and are available in eMapPA. The GWMN is conducted in accordance with Pennsylvania's Groundwater Quality Monitoring Network: Ambient and Fixed Station Network (FSN) Monitoring Programs, 383-3200-009.

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

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. The 2018 Integrated Report highlights Pennsylvania's 228 significant lakes totaling 99,654 acres. Another 170 public waterways are used as lakes but may not have a 14-day retention time. Lake assessments are done on both "significant" and "other" lakes with various partners including United States Geological Survey, EPA, citizen volunteers, DCNR, United States Army Corps of Engineers (ACOE), CCDs and consultants. Since 1997, 357 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 assessments. Basic water quality assessments are performed 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 five-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. Multiple lake samples are collected three times in one year (spring, summer, and fall) from each lake.

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 through DEP's Citizen Volunteer Monitoring Program to collect lake data from 2001 to 2008. Lake sampling continues through the six DEP Regional efforts, CCD Watershed Specialists, DCNR Lake Management efforts, and DEP central office coordination of collected data. 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 biannual Integrated Report.

4. Citizen Science Monitoring

Almost by definition, the problems of nonpoint source 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 science 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 watershed monitoring for stream delisting, bacteriological monitoring in lakes, and monitoring riparian buffers. By working with citizens and partnering with DEP, the hope is to integrate more volunteers into projects like screening for delisting, restoration monitoring and other monitoring in order to meet volunteer and DEP needs.

Pennsylvania also supports citizen scientists through technical assistance Growing Greener grants to service providers. The service providers pass on knowledge to citizen groups enabling them to become self-sustaining watershed stewards for their local lakes and streams.

C. Restorative Programs

1. Section 319, NPS Management Program

DEP's Watershed Support Section supports nonpoint source pollution abatement projects with funding through grants under Section 319(h) of the CWA. The 319 Program is under the Office of Water Resources Planning and has the 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 nonpoint source pollution abatement within Pennsylvania. Since 1990 Pennsylvania has received over $127 million from EPA to support nonpoint source pollution reduction activities within the Commonwealth through the NPS Management Program.

The 319 Program as administered in Pennsylvania focuses its limited funding resources on implementing BMPs specified in EPA approved WIPs, developed to identify needed

BMPs to restore impaired priority waters. Section 319 implementation funds are focused in the priority watersheds with EPA approved WIPs. These WIPs address uncontrolled urban stormwater runoff, agricultural runoff, AMD, 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 NPS Management Plan. Through this annual reporting effort, the state documents the progress made in restoring 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.

Further, through partnering and grant oversight, DEP's Watershed Support Section engages CCD Watershed Specialists who amplify funding, outreach, and restoration efforts through watershed association-based liaison-activities. The section also 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 DEP, the 319 Program coordinates restorative activities on precise watersheds throughout the Commonwealth.

To learn more about the 319 Program, go to:
https://www.dep.pa.gov/Business/Water/PlanningConservation/NonpointSource/Pages/default.aspx

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. As of the 2019 state fiscal year, the Growing Greener program has provided over $440 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 mined lands; and demonstration/education projects and outreach activities. These grants are available to a variety of eligible applicants, including counties, authorities, municipalities, CCDs, 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

NRCS and EPA are continuing to partner 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 has been participating in this program. Currently the state has three watersheds identified for focused agriculture nonpoint source pollution remediation funding provided through this effort, with another three proposed at this time. 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 CCDs where these watersheds are located to provide an intense and long-term monitoring program to track water quality impacts of this initiative.

In 2019, new NWQI guidance was released that requires the identification of a specific metric and monitoring of that metric. Since water quality improvements may take years, the need was there to demonstrate progress on a regular basis. So, metrics that can track implementation in the watersheds were developed. These were specific to each watershed and could include something like acres of practices installed. It also widened the scope of the initiative to include source water protection. Toward this, DEP has been working with USDA, identifying potential watersheds for participation in the program, providing monitoring data, and establishing monitoring protocols.

4. Watershed Implementation Plans

Pennsylvania's NPS Management Program initiated the development of stream and lake watershed restoration plans in several watersheds throughout the state. These plans are commonly referred to as WIPs, as the content and focus of the WIPs is the implementation of BMPs. These WIPs are designed to address specific elements, as directed by EPA 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 nonpoint source pollution control projects with Section 319 grant funds. The NPS Management Program provides technical support to local groups interested in preparing WIPs, with priority given to groups working actively in watersheds containing significant nonpoint source pollution 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 EPA approved WIPs being implemented in the Commonwealth. These WIPs represent priority watersheds for the NPS Management Program where EPA 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:
https://www.dep.pa.gov/Business/Water/PlanningConservation/NonpointSource/Pages/Plans.aspx

EPA's Guidance to Watershed-based Plans:
https://www.epa.gov/sites/production/files/2015-12/documents/watershed_mgmnt_quick_guide.pdf

5. 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 State Water Plan be completed and adopted within five years of the effective date of the legislation and reviewed every five years thereafter. An update to the State Water Plan was completed in 2009 and a new update is currently underway, planned to be completed in 2021.

In January 2009, DEP's Secretary signed the new State Water Plan document which replaced the outdated State Water Plan last completed in 1983. This update 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 State 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 2009 State Water 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 State Water Plan consists of several products:

- Data and Analyses. The water resources data and technical work are the backbone of the State Water Plan, which includes the identification of Critical Water Planning Areas (CWPAs). The results of the technical work of the State Water 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 was 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 in the 2021 update.

- 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.

CWPAs are areas of the Commonwealth where existing or future demands exceed or threaten to exceed the safe yield of available water resources. In January 2011, DEP officially designated the following watersheds as CWPAs: Back Creek, Fayette County, Laurel Hill Creek, Somerset County, and Marsh and Rock Creeks in Adams County. Act 220 provided the authority to prepare a Critical Area Resource Plan (CARP) for any watershed within a CWPA. Required components of a CARP include assessments of water availability and quality, water uses, conflicts among users and consideration of stormwater and floodplain issues. A CARP must also identify practical alternative for assuring an adequate supply of water to satisfy existing and future reasonable and beneficial uses.

Currently, DEP is working to update the 2009 State Water Plan by the end of 2021. Tasks underway include:

- Enabling open access to and sharing of water use data by water resources decision makers and the public through further development of web-based tools.

DEP has been collecting water use data from users on an annual basis since 2003 to inform the current State Water Plan update. Data sharing tools have been built to make the data readily available to the public. Ongoing applications are under development for the public to view summarized water use reports.

- Forming and maintaining the statewide and regional committees.
- Finalizing the CARPs prepared in the 2009 State Water Plan Update for further consideration by the committees.
- Incorporating climate change and Integrated Water Resources Planning (IWRP) into the 2021 update.

The State Water Plan, data sharing tools, and information can be found at the State Water Plan website:
https://www.dep.pa.gov/Business/Water/PlanningConservation/StateWaterPlan/Pages/default.aspx

6. DCNR Rivers Conservation Program

DCNR's Pennsylvania Rivers Conservation Program is managed by DCNR's Bureau of Recreation and Conservation (BRC). The Rivers Program supports efforts to provide water-based outdoor recreation opportunities to the public and to conserve natural water resources. BRC offers a variety of assistance to local communities and non-governmental partners that 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:
https://www.dcnr.pa.gov/Conservation/Water/RiversConservation/Pages/default.aspx

7. Coastal Nonpoint Source Pollution Program

The Coastal Zone Act Reauthorization Amendments of 1990 (CZARA), 16 U.S.C. Sections 1451-1466, established Section 6217 to protect coastal waters from nonpoint source pollution. This program, administered jointly at the federal level 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. The program is led by the Coastal Resources Management (CRM) Program within the Compacts and Commission Office. Through cooperative staff efforts by CRM, the Office of Water Resources Planning, and Office of Water Programs, 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 nonpoint source pollution, and grants administered by CRM. This includes a new partnership with the Erie County Department of Planning's Municipal Stormwater Assistance Program. This program will provide education, planning support, and GIS mapping services to municipalities. CRM will also continue to fund various pass-through grants that fund planning and on-the-ground projects that address nonpoint source pollution in the Northwest and Southeast areas. Since 2010, CRM has funded 30 pass-through projects that address water quality, utilizing approximately $1 million of federal funds, matched by over $1.2 million of local monies. This money has been utilized to fund research, education/outreach, planning, and applied projects to improve water quality. CRM continues to utilize existing partnerships to enhance existing and develop new initiatives in coastal areas including implementation of the Domestic Action Plan for Phosphorus in Lake Erie, erosion via bluff recession authorities and BMPs to address other nonpoint source pollution issues. 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, refer to website
https://www.dep.pa.gov/Business/Water/Compacts%20and%20Commissions/Coastal%20Resources%20Management%20Program/Pages/default.aspx

8. 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 the sustainability of Pennsylvania's ecological and economic coastal and watershed resources through science-based research, education, and outreach. The NOAA, within the United States 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 nonpoint source 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:
https://seagrant.psu.edu/

9. 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 nonpoint source pollution, development, or overuse.

An Agreement was entered into on October 9, 2014, by and among the three states, along with EPA Regions 2 and 3, the Partnership for the Delaware Estuary, Inc. (PDE) and its Board of Directors, the Delaware River Basin Commission (DRBC), and the City of Philadelphia - also known as the core partners. A primary purpose of the Delaware Estuary Program is to develop and subsequently implement a Comprehensive Conservation and Management Plan (CCMP) to protect the Delaware Estuary. The original CCMP was approved September 1996 and intended to guide the collective efforts of environmental agencies and organizations in the region to protect and enhance the Delaware River and Bay. The recent revised CCMP (2019 version) seeks to continue and accelerate improvement of the habitats, waters, and quality of life in the watershed over the next ten years through employing its seven goals and thirty-nine strategies. The CCMP focuses on several pillars: Clean Waters; Strong Communities; Healthy Habitats; and a Financial and Monitoring Approach to help achieve the goals set forth in the CCMP.

10. Great Lakes Program

Pennsylvania's 77 miles of coastline on Lake Erie - as well as 512 square miles of Lake Erie watershed and 99 square miles of Genesee River watershed in Potter County that flows to Lake Ontario - provides PA with the opportunity to take an active part in the management of the Great Lakes Basin. The Great Lakes are nationally and globally important as a freshwater system comprising 84% of the surface freshwater in North America and 21% of the world's supply. In 1995, Governor Tom Ridge created the Office of the Great Lakes to devote full attention to Great Lakes issues, a charge that continues today in the DEP's Great Lakes Program. This Program cooperates with two nations, two provinces, eight states, and scores of local municipal governments to comprehensively manage Great Lakes water and land resources.

The Great Lakes encountered water quality challenges for many years, and they continue today, especially in Lake Erie. Contemporary water quality issues on Lake Erie include nonpoint sources of pollution from urban and agricultural land uses, specifically contributions of phosphorus that can lead to growth of harmful algal blooms and areas of low oxygen levels in the lake impacting fish and aquatic organisms. While Pennsylvania's loading of phosphorus to Lake Erie is low compared to other jurisdictions, the Great Lakes Program is committed to addressing sources of nonpoint source pollution originating in Pennsylvania. Lake Erie Basin land uses in Pennsylvania range from vineyards and orchards in eastern Erie County, to the impervious and urbanized landscape in the City of Erie and surrounding municipalities, to row crop agriculture and forested public lands in western Erie County and northwestern Crawford County. Each of these areas require different management techniques and levels of effort. The Great Lakes Program utilizes federal, state, and local resources to meet water quality protection and restoration goals.

The Great Lakes Restoration Initiative (GLRI) was established by the United States federal government in 2009 and has provided over $2.3 billion to federal, state, local entities to protect and restore the Great Lakes. The Great Lakes Program and Pennsylvania partners utilized this funding to implement programs that addressed nonpoint source pollution in the Lake Erie and Genesee River Basins and reduced impacts from agriculture and urban stormwater runoff. GLRI was instrumental in removing Presque Isle Bay from the list of Great Lakes Areas of Concern and helped to maintain the Bay and waters of Lake Erie as a destination for boating, fishing, and recreational opportunities for citizens and visitors. The GLRI, reauthorized in 2019 for another five years, will provide funds to protect and restore the Great Lakes from FY2020 - FY2024 by concentrating on five focus areas – Toxic Substances and Areas of

Concern, Invasive Species, Nonpoint Source Pollution Impacts on Nearshore health, Habitats and Species and Foundations for Future Restoration Actions.

11. Source Water Protection Programs

Contamination from nonpoint 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 provide the framework for the development of local, voluntary source water protection programs for community water systems. Local voluntary source water protection programs are supported and encouraged through education and technical assistance. Resources to develop community-based source water protection programs include a technical services provider via the Source Water Protection Technical Assistance Program and on-site assistance and classroom training by the Pennsylvania Rural Water Association. As the initial source water protection effort to protect groundwater sources serving community water systems, the state's Wellhead Protection Program forms the cornerstone of the Source Water Protection Program.

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

12. Groundwater Quality Protection Policy

Pennsylvania's Groundwater Protection Programs are summarized below. 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. Regarding 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.

13. National Monitoring Program in Pennsylvania

Monitoring of both land treatment and water quality is the best way to document the effectiveness of nonpoint source 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 nonpoint source pollution and the effectiveness of nonpoint source pollution control technology and approaches. There are only 24 national monitoring sites. Pennsylvania's 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 (Ongoing).

14. 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 NRCS, EPA, and ACOE. Local match is at least 25% of the total project cost. Projects in Pennsylvania have demonstrated or provided information regarding several innovative techniques to reduce streambank, urban and agricultural E&S. Between 2014-2018, the Great Lakes Basin Program supported one E&S control project in Pennsylvania totaling $50,000.

For more information, refer to website:
https://www.glc.org/work/sediment

15. 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 CCDs, to achieve pollution reduction goals for the Chesapeake Bay.

In August 2019, Pennsylvania finalized the Chesapeake Bay Phase 3 WIP, which is a catalog of activities and measures that, if applied to Pennsylvania's Susquehanna and Potomac Watersheds, will generate appreciable nutrient or sediment reductions providing cleaner water resources in the Commonwealth while helping to restore the water quality downstream in the Chesapeake Bay. The implementation of the third phase of the WIP will be focused on the development and implementation of Countywide Action Plans (CAPs), developed at the county level. These CAPs will identify the specific methodologies and resources needed to successfully implement the projects necessary to address local water quality issues and priorities. The goals of the 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 year in meeting the biennial implementation milestones outlined in the WIPs. As part of the 2017 Midpoint Assessment process and the establishment of EPA expectations for the WIP, this progress reporting has been revised to every six months for programmatic commitments and every year for numeric commitments for the Commonwealth. Pennsylvania has committed to providing this 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 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 Management Program to monitor progress in

meeting the various EPA approved CWA Section 319 WIPs in our priority watersheds throughout the state.

Pennsylvania, through a collaborative effort between DEP and the CCDs, began the Chesapeake Bay Agriculture Inspection Program as part of the 2016 Chesapeake Bay Restoration Strategy in July 2016. The goal of this program is to inspect 10% of the farm acreage in the watershed every year to determine whether these farm operations are in compliance with existing state manure management and agriculture E&S control planning regulatory requirements. These inspections are separate from the CAFO inspections or inspections conducted for other purposes.

For more information, refer to website: www.dep.pa.gov/chesapeakebay/phase3 or by emailing the DEP Chesapeake Bay Office at RA-EPChesBay@pa.gov.

16. Nutrient Trading

Nutrient 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 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 Section 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, and registration of nutrient sediment. In 2016, trading supplements were added for the Chesapeake Bay WIP area. Clarification was made for cap loads for both nonpoint and point sources as well as wastewater.

For more information, refer to website:
https://www.dep.pa.gov/Business/Water/CleanWater/NutrientTrading/Pages/default.aspx

17. Commonwealth Financing Authority – Act 13 Projects

The 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.

Since the program's inception, the AMDATP provided over $8.4 million to 22 projects to abate the impacts of AMD within the Commonwealth. During the same timeframe, over $12.8 million was awarded to 87 projects under the WRPP to address agricultural and urban stormwater issues degrading streams within Pennsylvania.

For more information, refer to website:
https://dced.pa.gov/programs-funding/commonwealth-financing-authority-cfa/

18. Regional Conservation Partnership Program

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 aids producers through RCPP contracts or easement agreements.

RCPP combines the authorities of six former conservation programs - the Agricultural Water Enhancement Program, the Chesapeake Bay Watershed Program, the Cooperative Conservation Partnership Initiative, the Great Lakes Basin Program, the Conservation Reserve Program, and the PL-566 (watersheds) 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 NPS Management Plan update, is still determining additional project areas within the state.

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

19. Engineering Assistance Program - Technical Assistance Grant

Since 2001, the 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 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 NRCS, the technical staff completed over 1,300 projects worth $60 million since 2001. Funded construction projects worth over $7.9 million are currently awaiting assistance through the current grant which ends in 2021.

To learn more about the Technical Assistance Grant Program, go to:
https://pacd.org/?page_id=84

20. PENNVEST Nonpoint Source Program

The Pennsylvania Infrastructure Investment Authority (PENNVEST) Nonpoint Source Program provides low interest loans, principal forgiveness loans and grants for BMPs and innovative techniques developed to comply with and implement the Pennsylvania Clean Streams Law (P.L. 1987, No. 394), the Pennsylvania Stormwater Management Act (P.L. 864, No. 167) or activities and projects identified in Pennsylvania's NPS Management Program Update. Eligible projects include but are not limited to agricultural BMPs, AMD remediation, urban stormwater management, silviculture BMPs, brownfield remediation and on-lot systems. From April 1992 through April 2019, PENNVEST has invested more than $366 million in loans and $108 million in grants and principal forgiveness loans to support the implementation of these important nonpoint source pollution management projects and BMPs on agricultural operations and urban stormwater sites.

For more information on the PENNVEST NPS Management Program, go to: https://www.PENNVEST.pa.gov/Information/Funding-Programs/Pages/Nonpoint-Source.aspx

21. TreeVitalize

TreeVitalize is DCNR's state urban forestry program, a public-private partnership coordinated by the Bureau of Forestry. Its goals are to restore tree cover in Pennsylvania communities, to educate citizens about the benefits of trees and the value of tree cover, and to build capacity among local governments to understand, protect and restore trees in developed areas. Launched in 2004 in southeastern Pennsylvania, TreeVitalize became universally available across the state in 2013. The program offers technical and financial assistance to plant, maintain, and manage community trees, with small grants of $2,000 - $25,000 awarded annually to municipalities and non-profit organizations. To date, some 400,000 trees have been planted through the help of many partners and interested community volunteers.

For more information on the TreeVitalize program, go to: https://www.dcnr.pa.gov/Communities/CommunityTreeManagement/Pages/default.aspx

22. Quick Response Program

WPCAMR administers a Quick Response Program that provides funding for urgent 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 Quick Response program, go to: http://www.wpcamr.org/projects/QuickResponse/index.html

23. Nonpoint Source Education Office

The Pennsylvania Association of Conservation Districts administers the Pennsylvania NPS Education Office and performs various activities designed to enhance and support CCD nonpoint source pollution educational efforts as well as Section 319 and DEP watershed priorities. This program provides the nonpoint source pollution educational mini-grant program, development and maintenance of the PA NPS Education Program website, and support for various workshops and trainings.

24. 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.

For more information on oil and gas plugging, go to:
https://www.dep.pa.gov/Business/Energy/OilandGasPrograms/OilandGasMgmt/LegacyWells/Pages/Well-Plugging-Program.aspx

25. Environmental Quality Incentives Program

The Environmental Quality Incentives Program (EQIP), administered by NRCS, 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. Over the time period covered by the 2014 Farm Bill, EQIP provided $98.8 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/

26. Conservation Reserve Enhancement Program

The CREP is an offshoot of the Conservation Reserve Program (CRP), the country's largest private-land conservation program. Administered by the FSA, the program is a partnership among farmers, state and federal government, and private groups.

Pennsylvania CREP projects are designed to target environmental concerns in the Chesapeake Bay, Ohio River, and Delaware River basin drainages and neighboring upland habitat. The program is voluntary and offers financial incentives, annual rental and incentive payments to encourage agricultural landowners and operators to enroll targeted environmentally sensitive and potentially wildlife-friendly acres of pastureland and cropland. This includes the establishment of native grass stands, riparian buffers, wetlands, wildlife habitat, grass filter strips and other land improvement practices. CREP is available in 66 counties across the state and has 138,127 acres under contract for the benefit of soil, water and wildlife. The contract period is typically 10 to 15 years.

As of September 2018, there are 9,579 active CREP contracts covering approximately 138,127 acres in Pennsylvania. FSA provided roughly $17 million and DEP provided approximately $279,000 in cost share payments in 2017-2018.

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

27. Integrated Pest Management Program

Pennsylvania's Integrated Pest Management (IPM) program focuses on effective pest management in a manner that is profitable, safe and environmentally compatible. The PDA is required by the Pesticide Control Act, 3 P.S. Sections 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 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 both of these efforts, having similar goals. This collaborative effort is known as the Pennsylvania IPM Program.

For more information on Pennsylvania's IPM program, go to:
https://www.agriculture.pa.gov/Plants_Land_Water/PlantIndustry/health-safety/environmental-programs/IPM/Pages/default.aspx

28. 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. DGLV 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. Section 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 DGLV 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 SCC to the 66 CCDs in Pennsylvania participating 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 DGLV roads in their jurisdictions. The SCC is responsible for allocating the remaining $28,000,000 to the 66 CCDs 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 and 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 The Pennsylvania State University Park Campus, this center provides technical assistance and training to participating entities. Through this program, over 19,500 miles of unpaved roads have been mapped and inspected, and over 7,000 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:
https://www.agriculture.pa.gov/Plants_Land_Water/StateConservationCommission/DGRMP/Pages/default.aspx

29. PA Stream ReLeaf

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. Most of the projects being tracked by the database has been funded by several sources: Alliance for the Chesapeake Bay, Chesapeake Bay Foundation, CREP, PFBC, Growing Greener, the 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 ReLeaf initiative, go to:
http://www.ahs.dep.pa.gov/streamreleaf/

30. PA Wellhead Protection Program

As required under the 1986 amendments to the federal Safe Drinking Water Act, the Pennsylvania DEP has developed a Wellhead Protection Program (WHPP) to protect groundwater 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. Currently housed in the Bureau of Safe Drinking Water, the WHPP serves as the groundwater component of the SWAPP, which is also required to be developed under the 1996 reauthorization of 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 WHPP 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 Safe Drinking Water has provided technical, educational and financial assistance to promote the development and implementation of local WHPPs. Various incentive grants to seed local wellhead protection development have been offered by DEP from the early 1990s to 2004. Since 2007, DEP provided a contractor through its Source Water Protection Technical Assistance Program to aid communities in developing local WHPPs. Outreach efforts including formal presentations, regional roundtables with water suppliers and co-promotional events with other organizations involved with ground-water protection will continue.

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

31. Act 537 Sewage Facilities Program

On January 24, 1966, the Pennsylvania Sewage Facilities Act, (Act 537), 35 P.S. Sections 750.1-750.20a, was enacted to correct existing sewage disposal problems and prevent future problems. The purpose of the DEP sewage facilities program is to implement the Pennsylvania Sewage Facilities Act, Act 537, to help address existing sewage disposal needs and to help prevent future problems through the proper planning, permitting, and design of all types of sewage facilities. 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 comprehensive 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 comprehensive plan, unless the project is exempt from planning.

For more information on Pennsylvania's 537 Sewage Facilities Program, go to:
https://www.dep.pa.gov/Business/Water/CleanWater/WastewaterMgmt/Act537/Pages/default.aspx

32. Surface Mining Control and Reclamation Act (SMCRA) Grants

Section 18(j) of SMCRA , 52 P.S. Section -1396.11396.19b allows DEP to award grants to municipalities, municipal authorities, and appropriate incorporated non-profit 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 AMD impacts on the waters of the Commonwealth.

33. Abandoned Mine Reclamation Program

DEP's 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 OSMRE under authority of SMCRA , 30 U.S.C. Section- 12011328.

AML funding is provided to Pennsylvania through grants from OSMRE. SMCRA requires that active coal operators pay an AML fee on each ton of coal mined. OSMRE 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 2019, Pennsylvania received an AML grant award of $ 53.8 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.

To learn more about Pennsylvania's AML Program, go to: https://www.dep.pa.gov/Business/Land/Mining/AbandonedMineReclamation/AMLProgramInformation/Pages/default.aspx

34. AMD Set-Aside Program

BAMR administers the AMD Set-Aside Program in Pennsylvania. This program receives funding from the OSMRE, also under the authority of SMCRA, to abate and treat AMD in Qualified Hydrologic Units (QHUPs). Up to 30% of Pennsylvania'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.

35. Abandoned Mine Drainage Technical Assistance Program

The Pennsylvania Council of Trout Unlimited (PATU) administers an AMD Technical Assistance Program. With this program PATU has provided free assistance to watershed groups, PATU chapters, CCDs, and others with a variety of AMD projects. With the help of PATU's 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;
- QHUP development;
- Technical capacity building; and
- Other, as treated on a case-by-case basis.

36. Nonpoint Source Technical Assistance Program

Pennsylvania Trout Unlimited will continue to provide technical assistance to CCDs, watershed organizations, Trout Unlimited chapters, and other Growing Greener eligible entities to address nonpoint source pollution in the Chesapeake Bay watershed of Pennsylvania. This includes streambank stabilization and habitat projects. The types of free technical assistance being offered include the following:

- Snapshot site assessments;
- Instream structures BMP design;
- Riparian BMP design;
- Dirt and gravel road Environmentally Sensitive Maintenance (ESM) Practices design;
- Ag-related BMP design;
- Permitting; and
- Construction oversight.

37. Source Water Assessment and Protection Program

Recognizing the success of wellhead protection efforts in identifying potential contaminant threats and minimizing risk to wells and springs through proper management of the contributing area, the wellhead protection concept was subsequently expanded to all sources used by public water systems in 1996 when the Safe Drinking Water Act was reauthorized. States were now required to develop a SWAPP to assess all drinking water sources - surface water and ground water - serving public water systems for their susceptibility to pollution. The source water assessment serves as the skeletal framework for building a voluntary, community-based drinking water source protection program to prevent costly contamination of public drinking water sources. Most of these assessments for sources in existence at the time were completed by DEP or a contractor around 2003 and provided a general evaluation of the protection area for an existing water source. Efforts since then have focused on using the assessments as a basis for developing local source water protection programs for community water systems. The Pennsylvania Safe Drinking Water Regulations were updated in 2018 to update/clarify definitions of source water protection program and area for surface and ground-water sources plus include source water assessment language. To date, about half of Pennsylvania's community water systems have substantially implemented source water protection efforts that cover about 80% of the state's population.

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

38. Master Watershed Steward Program

The Penn State Extension Master Watershed Steward program turns citizens into a managed, educated, organized volunteer force addressing local conservation priorities. A

key strength of the program is its focus on collaboration, working with a broad partnership of local and state organizations, agencies, and government. People who want to make a difference are given the information and the opportunity to do so, guided by local conservation professionals who organize, supervise, and engage the volunteers to make a positive impact in their communities and their water quality.

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.

Master Watershed Stewards use the knowledge they have gained through training to educate the public through giving presentations to community groups, staffing educational displays at community events, writing articles and factsheets, and organizing workshops. Master Watershed Stewards also help to advance local implementation practices by assisting local organizations with projects such as riparian buffer installations, demonstration rain gardens and other BMPs, establishing wildlife habitat, and conducting water quality monitoring.

The program is now offered in 18 counties and will continue to expand throughout the state during the five-year life of the NPS Management Plan.

For more information on Pennsylvania's expanding Master Watershed Steward Program, go to:
https://extension.psu.edu/programs/watershed-stewards

39. 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 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 which provides the public with information regarding the health of watersheds on USFS lands, their condition, and several other factors. Within Pennsylvania, the USFS has selected two "Functioning at Risk" watersheds as priority watersheds within the ANF. Those watersheds are the Farnsworth Branch 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, CCDs 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

40. PA VinES Program

The Pennsylvania Vested in Environmental Sustainability (PA VinES) Program, with funds administered by the Erie CCD, promotes sustainable viticulture practices for Concord and Niagara grape production in the Lake Erie Watershed. The Pennsylvania

Lake Erie Grape Region boasts approximately 10,000 acres of juice and wine grapes and supports Pennsylvania's rank of fifth nationally for grapes grown. The goal of the PA VinES Program is to provide grape growers a method to self-assess practices in their vineyards while ensuring minimal negative impacts to the environment through reductions to sediment and nutrient loads in Lake Erie tributaries. Through a self-assessment workbook, growers can reach program goals by evaluating management objectives such as: vineyard soil and erosion management, nutrition management, vineyard management, weed management, integrated pest management, and pesticide management. Then by installing BMPs, the CCD reduces nitrogen, phosphorus, and sediment loading in the Lake Erie Watershed.

41. Green Infrastructure

Green Infrastructure (GI) manages wet weather stormwater impacts by preserving or restoring natural areas. Some common practices include rain gardens, green roofs, porous pavement and stream buffers. GI can be utilized when existing infrastructure like streets, parking lots, and public recreational areas such as parks undergo maintenance or upgrades. Adding GI, such as green streets and rain gardens, in urban areas helps to protect and restore the health of local streams and rivers. Runoff and stream erosion in urban environments can be reduced in areas utilizing green space since pollutants, such as sediment, nitrogen and phosphorus can be filtered out of stormwater before entering waterways.

Communities can showcase green infrastructure practices by implementing projects in public places. Residents, businesses, and local governments can take advantage of aesthetically pleasing streets and sidewalks as well as green public parks. As more communities utilize GI, the experience gained from the design, installation and maintenance of these projects can help develop regulations and incentive programs to make GI easier to implement in the future.

DEP ensures that stormwater activities and plans approved will employ stormwater management plans utilizing best management practices to control the volume, rate and water quality of post construction stormwater runoff to protect and maintain the chemical, physical and biological properties of waters of the Commonwealth.

Clean, reliable water resources are critical for sustaining the environmental health of our natural resources, protecting the public's health and safety, and maintaining the economic vitality of the Commonwealth. The Pennsylvania Stormwater Best Management Practices manual ensures effective stormwater management to minimize the adverse impacts of stormwater on ground water and surface water resources to support and sustain the social, economic and environmental quality. The manual provides guidance, options and tools that can be used to protect water quality, enhance water availability and reduce flooding potential through effective stormwater management, including structural BMPs containing information about green infrastructure.

For more information on GI, go to:
https://www.epa.gov/green-infrastructure

Pennsylvania Stormwater Best Management Practices Manual
https://www.dep.pa.gov/Business/Water/CleanWater/StormwaterMgmt/Stormwater%20Construction/Pages/E-S%20Resources.aspx

42. Climate Action Plan

With a robust agricultural industry, numerous recreational opportunities, abundant water resources and drainage to the Chesapeake Bay, Pennsylvania is very vulnerable to climate change. Gaining an understanding of climate risks so that Pennsylvania can work with various stakeholders across Pennsylvania including planners and policy makers is important. The Pennsylvania Climate Act of 2008 with subsequent updates requires a study on the potential impacts of climate change in Pennsylvania.

Areas of climate change study include agriculture as well as forestry, recreation, tourism, and water resources. Potential changes affecting agriculture include altered growing seasons and changes in temperature and precipitation. Pennsylvania needs to work with farmers to encourage the use of BMPs on their farms to reduce runoff and to plan for potential changes in crop types.

Forestry, recreation and tourism are also economically important to Pennsylvania. State and local leaders need to look at vulnerabilities to species, habitats and ecosystems as well as changes in outdoor activities and tourism due to temperature and precipitation variability. By working together, the state and local planners can prepare ways to deal with changes as they occur.

Water resources and the Chesapeake Bay are also economically and environmentally important to Pennsylvania. Pennsylvania can assist communities when planning by advocating the use of BMPs, water conservation and integrated water resources management to help adjust to changing precipitation patterns and help reduce runoff and impacts to infrastructure. Planning being undertaken for the Bay cleanup must also consider climate impacts as cleanup strategies are being developed.

For more information on climate change, go to:
https://www.dep.pa.gov/Citizens/climate/Pages/default.aspx

The Pennsylvania Climate Action Plan can be found at:
https://www.dep.pa.gov/Citizens/climate/Pages/PA-Climate-Action-Plan.aspx

43. Return on the Environment

Understanding the connection between nature and quality of life so that communities undergoing growth can strike a balance between green and growth is important in Pennsylvania. Return on the Environment shows how conserving and maintaining natural resources while planning for growth can improve the quality of life for citizens while maintaining economic sustainability for the communities.

Return on the Environment reports include information on the financial value of nature. Once the importance and value of nature including trees, streams, clean water, clean air, open space and other environmental services are understood, they can be tied into quality of life for citizens. This is a useful tool for communities to utilize when planning for growth since many people prefer to live in green thriving communities.

For more information on Return on the Environment, go to:
https://kittatinnyridge.org/explore/roe/

44. Healthy Waters Initiative

Pennsylvania is interested in maintaining healthy watersheds through early detection of potential threats. By including Healthy Waters in grant programs like Growing Greener, the goal is to protect healthy, intact watersheds and prevent degradation from impending environmental threats. Data can be used for projecting trends, within watersheds which may be headed toward a threshold that will threaten the integrity of the watershed. Once identified, the trends and accompanying threats can be taken into consideration when planning and applying practices within the watershed to curtail future impacts to the watershed. Threats may include changing land use, nonpoint source pollution, invasive species, non-sustainable development, impervious cover, and lack of green practices.

Maintaining healthy watersheds and important watersheds like EV and HQ Waters, Class A Wild Trout, and Scenic Rivers is important to Pennsylvania. It is imperative to educate and promote healthy watersheds to officials, planners and stakeholders. The beneficial roles of healthy watersheds are extensive and include environmental services, economic benefits and increases in physical and mental health wellness.

For more information on Healthy Waters, go to:
https://www.epa.gov/hwp/benefits-healthy-watersheds

45. Pennsylvania Silver Jackets

Hazard mitigation is any approach taken to reduce or eliminate hazards, either natural or man-made. Generally, consideration is given to the most cost-effective way to achieve the mitigation which eliminates the risk to life. In Pennsylvania, the most common hazard is flooding while the most common mitigation for flooding is the buyout of flood prone homes.

Other options may be available to mitigate flooding before it happens. When agencies, communities, and stakeholders work together to address problem areas before flooding takes place, flooding impacts are reduced or eliminated. One way this occurs is through grant funding for floodplain restoration. By increasing floodplain areas along streams, water moves through the system better, erosion decreases, and property impacts are reduced. These types of projects are a cost-effective way to mitigate flood hazards. Both PEMA and FEMA are partners for various projects.

Pennsylvania has an interagency team, Pennsylvania Silver Jackets, dedicated to working together with other Commonwealth entities and stakeholders to come up with solutions to flood hazards utilizing agency resources and expertise. Moving forward with continued cooperation and innovative projects, Pennsylvania is on track to reduce flood impacts to life and property.

For more information on hazard mitigation, go to:
https://www.pema.pa.gov/responseandrecovery/Disaster-Assistance/Pages/Mitigation.aspx

For more information on the PA Silver Jackets, go to:
http://silverjackets.nfrmp.us/State-Teams/Pennsylvania

46. Villanova Urban Stormwater Partnership

The Villanova Urban Stormwater Partnership (VUSP) is a public/private partnership at Villanova University. The partnership utilizes the Villanova Urban Stormwater Control

Measure (SCM) Research and Demonstration Park at the university to study several types of SCMs including a stormwater wetland, bio-infiltration and bio-retention rain gardens and swales, pervious concrete/porous asphalt installations, infiltration trenches, and a green roof. The main project includes the redevelopment of a pervious parking lot into a residential site with pervious area, raingardens, infiltration trenches and cisterns to control and cool stormwater runoff. This project enabled Villanova to monitor influent and effluent flow and loadings from the impervious site to create baseline conditions prior to redevelopment. The changes will be monitored as the site is transformed through the implementation of green stormwater infrastructure.

The VUSP is supported by the Fluid Mechanics Lab, Soils Testing Lab and the Water Resources Teaching and Research Laboratory. Students from the university perform research, including modeling, on the hydrologic and hydraulic conditions and the environmental performance of numerous on-campus SCMs. Some of the tests that are carried out include nitrogen, chloride and phosphorus analysis, heavy metals analysis, total dissolved and suspended solids, pH, and conductivity.

For more information on VUSP, go to:
https://www1.villanova.edu/villanova/engineering/research/resilient-water-systems/vusp.html

D. Regulatory Programs

Many of Pennsylvania's nonpoint source pollution regulatory programs that protect water quality are implemented under the authority of its Clean Streams Law, originally passed in 1937, 35 P.S. Section 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, including but not limited to the Dam Safety and Encroachments Act, provide additional authority to regulate specific activities. Many of Pennsylvania's environmental regulations impacting water quality originate under these various statutes and are administered through regulatory programs established under Title 25 Environmental Protection of the Pennsylvania Code, The NPS management programs 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 view Pennsylvania's Clean Streams Law, go to:
http://www.depgreenport.state.pa.us/elibrary/GetFolder?FolderID=4192

1. Water Quality Standards and TMDLs

Pennsylvania has adopted water quality standards as required by Section 303 of the CWA to protect designated and existing uses of the waters of the Commonwealth. Those standards are set forth in Chapter 93 Water Quality Standards, along with a companion water quality toxics management strategy statement of policy in Chapter 16. 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 CWA, DEP identifies waters of the Commonwealth that are impaired as a result of pollution. DEP also develops TMDLs, commonly referred to as pollution diets, for impaired waters. 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 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.

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, interest and existing water quality projects can enhance restoration efforts.

For more information on Pennsylvania's TMDLs, go to: https://www.ahs.dep.pa.gov/TMDL/

2. Erosion and Sediment Pollution Control Program

The Commonwealth has a well-established and nationally-recognized Erosion and Sediment (E&S) Pollution Control Program. Pennsylvania's E&S Program is administered by DEP and CCDs coordinated through a delegation of DEP's authorities to CCDs. 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 plan reviews associated with permit applications and site inspections of the earth disturbance activity.

Standards and criteria for minimizing the potential for accelerated E&S and to manage post-construction stormwater are contained within DEP's Chapter 102 Erosion and Sediment Control (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, animal heavy use areas, land development (which includes road, highway, and bridge construction), road maintenance activities, timber harvesting activities, and for oil and gas activities. Chapter 102 requires that, for areas other than agricultural plowing and tilling and animal heavy use areas, a written E&S Plan be developed and implemented for the earth disturbance activities. Each E&S Plan must identify the BMPs (i.e., the control measures and facilities) that will be used to minimize accelerated E&S during the earth disturbance activity. For areas other than agricultural plowing and tilling and animal heavy uses areas, permitting may be required under Chapter 102 based upon the total earth disturbance for the project (this includes the NPDES permitting program for stormwater discharges associated with construction activities).

Both DEP and CCDs 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 CCDs to maintain their proficiency and program involvement.

DEP, in conjunction with the delegated CCDs, 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 Sediment Control regulations.

For more information on Pennsylvania's Erosion and Sediment Control Program, refer to our website at www.dep.pa.gov and search the keywords "Construction Stormwater" or

follow the direct link at
https://www.dep.pa.gov/Business/Water/CleanWater/StormwaterMgmt/Stormwater%20Construction/Pages/default.aspx.

3. Agricultural Nutrient Management

Pennsylvania's first nutrient management law became effective in 1993 (Act 6), 3 P.S. Section 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, known as CAOs, to prepare and implement Nutrient Management Plans (NMPs). Existing operations were required to have NMPs by one year after the date regulations became effective (October 1, 1997). NMPs were to be carried out within three years of approval and updated or amended every three years, until the CAO was no longer regulated under Act 6. The SCC was given responsibility for developing regulations establishing minimum criteria for NMPs that incorporate BMPs.

In 2002, the SCC 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. Section 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 Section 83.1-83.812.

This revised law enhanced the efforts of the SCC to oversee the management of CAOs within the Commonwealth. This law serves as a cornerstone of the Commonwealth's actions to minimize nutrient pollution coming from agricultural operations.

In 2006, the DEP, which oversees the NPDES CAFO program for the EPA, designated the Act 38 NMP as being the nutrient planning portion of the CAFO NPDES permit.

In 1986, DEP produced the Manure Management Manual under the Pennsylvania Clean Streams Law and Chapter 91 (Section 5(b)(1) and Section 402 of the Pennsylvania Clean Streams Law, 35 P.S. Sections 691.5(b)(1) and 691.402; Section 1920-A of the Administrative Code of 1929, 71 P.S. Section 510-20, and 25 Pa. Code Section 91.36(b)).

For more information on the regulation of CAFOs, go to:
https://www.dep.pa.gov/Business/Water/CleanWater/AgriculturalOperations/CAFOs/Pages/default.aspx

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 Section 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 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 many 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. It is to be used by any

operation that generates or utilizes manure that would not otherwise be covered by the CAO or CAFO requirements mentioned in the previous section. 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 E&S 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 E&S 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 CCDs, to ensure all farmers across the Commonwealth are aware of the requirements outlined in the Manure Management Manual as well as the Chapter 102 regulations and planning requirements. As a follow up to this education initiative, DEP along with participating CCDs, are carrying out an enhanced farm inspection program to ensure that all farms within the Chesapeake Bay watershed are implementing the required plans.

For more information on the Manure Management Manual, go to: https://www.dep.pa.gov/Business/Water/CleanWater/AgriculturalOperations/ManureManagement/Pages/default.aspx

5. Waterways and Wetlands Management

DEP administers the waterways and wetlands permitting program as required by DEP's Chapter 105 Dam Safety and Waterway Management rules and regulations as authorized under Pennsylvania's Dam Safety and Encroachments Act (DSEA), 32 P.S. Section 693.1-693.27. Projects that require stream and wetlands crossings must meet permitting requirements which include implementation of BMPs and, when appropriate, mitigation measures to ensure the waters of the Commonwealth are not adversely impacted.

The DSEA 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 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. A Joint Permit Application process is used when applying for a WOEP from DEP and a federal authorization from the ACOE under Section 404 of the CWA (33 U.S.C. Section 1344) or Sections 9 or 10 of the Rivers and Harbors Act of 1899 (33 U.S.C. Section 403). If DEP issues a WOEP, a separate Water Quality Certification is issued under Section 401 of the CWA (33 U.S.C. Section 1341(a)). The state water quality certification included with the WOEP authorization is associated only with activities where Federal Section 10 or 404 authorization by the ACOE is required. If other DEP permits or approvals are required for a Federal license or permit under Section 401(a)(1) of the Federal CWA, DEP recommends holding a pre-application meeting to discuss other state permits or authorizations, along with application requirements that may be needed, to obtain a comprehensive state water quality certification for the project.

For more information on waterways and wetlands management, go to:
https://www.dep.pa.gov/Business/Water/Waterways/PagEs/default.aspx

6. Stormwater Management Act (Act 167)

DEP administers Pennsylvania's Stormwater Management Program as authorized by the Stormwater Management Act (Act 167), 32 P.S. Sections 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 watershed stormwater management plan. These watershed stormwater management plans consider hydrologic and hydraulic effects of changes in land use and the quantitative and qualitative impacts on receiving streams. Nonpoint source pollution may be considered as one of the components in a watershed stormwater management plan. The specific issues addressed are:

- Identification of critical nonpoint source polluted 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 stormwater management plan will provide standards and criteria for the nonpoint source pollution water quality controls associated with new development activities. Applicable structural and nonstructural BMPs are recommended within those watershed stormwater management plans that are unique to the watersheds. The standards and criteria in the watershed stormwater management plan are implemented by local municipalities through their codes and ordinances. If local governments desire, construction projects may be undertaken, as recommended within the watershed stormwater management 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 watershed stormwater management 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 on Act 167, go to:
http://www.stormwaterpa.org/assets/media/regulatory/3930-FS-DEP4101.pdf
https://www.dep.pa.gov/Business/Water/CleanWater/StormwaterMgmt/Pages/Act-167.aspx

7. On-lot Sewage Program

DEP administers an On-lot Sewage Program mandated by the Pennsylvania Sewage Facilities Act, 35 P.S. Sections 750.1–750.20. The on-lot sewage facility portion of the program is largely administered on the local government level by individual municipalities or groups of municipalities working together (including County Health Departments), which are known as local agencies and joint local agencies, respectively. Local agencies receive technical oversight and minimal financial assistance from DEP.

Over 850 local Sewage Enforcement Officers (SEOs) are engaged in the planning, permitting, inspection and regulation of on-lot sewage disposal systems.

For more information, refer to:
https://www.dep.pa.gov/Business/Water/CleanWater/WastewaterMgmt/Act537/OnlotDisposal/Pages/default.aspx

8. Biosolids Program

In Pennsylvania, an estimated 400,000 dry tons of wastewater treatment solids are generated each year by more than 700 municipal wastewater treatment facilities serving nearly nine million citizens across the state. Pennsylvanians produce approximately 605 million gallons of sewage solids, or residential septage, annually through onlot sewage treatment systems. This material must be managed properly to protect public health and the environment. One method available is to recycle wastewater solids through reuse as biosolids. Pennsylvanians produce an estimated 2.2 million tons of biosolids, each year, nearly a quarter of a ton per household. 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.

EPA 40 CFR Part 503, establishes standards, which consist of general requirements, pollutant limits, management practices, and operational standards, for the final use or disposal of sewage sludge (biosolids) generated during the treatment of domestic sewage in a treatment works. Standards are included for biosolids land applied, placed on a surface disposal site, or fired in a sewage sludge incinerator. Also included are pathogen and alternative vector attraction reduction requirements for sewage sludge applied to the land or placed on a surface disposal site.

The DEP regulations that address the beneficial reuse of biosolids, including the generation and application, have not significantly changed since inception in 1997. These regulations remain and, are outlined in 25 Pa. Code Chapter 271 Subchapter J and are consistent with the EPA 40 CFR Part 503 regulations. 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.

40 CFR Part 503, establishes standards, which consist of general requirements, pollutant limits, management practices, and operational standards, for the final use or disposal of sewage sludge (biosolids) generated during the treatment of domestic sewage in a treatment works. Standards are included for biosolids land applied, placed on a surface disposal site, or fired in a sewage sludge incinerator. Also included are pathogen and alternative vector attraction reduction requirements for sewage sludge applied to the land or placed on a surface disposal site.

This approach was developed after extensive studies by the 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 environmental standards for land application must either be incinerated or taken to a landfill for disposal.

For more information, refer to:
https://www.dep.pa.gov/Business/Water/CleanWater/WastewaterMgmt/Biosolids/Pages/default.aspx

VI. Resource Allocation

Pennsylvania's NPS Management Program focuses on the protection and restoration of impaired stream reaches. Funding for restoration comes from the various program partners outlined in the NPS 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 procedures 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 nonpoint 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. 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 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 NPS Management Program prioritizes funding to high priority impaired watersheds (two - ten square miles in size) 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 Management 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.

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.

Most of the funding for agricultural projects originates from programs administered by NRCS. These programs have federally directed selection criteria and prioritization processes established. The Pennsylvania State Technical Committee administered by the Pennsylvania office of 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 an 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 scored by DEP Watershed Managers 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 NPS Management Program is operated in much the same way as the Growing Greener Program outlined above using an RFP process targeted to the priority watersheds identified under the 319 Program. Annually, the program solicits non-profit organizations and local government entities in the priority 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 year.

Both the Growing Greener and the Section 319 NPS Management Program fund a limited number of generalized nonpoint source pollution management 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.

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. 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 nonpoint source pollution abatement will continue to address the nonpoint source pollution problem, at the sub-watershed scale.

Table 5 lists several major sources of funding by entity and program and the amount in millions of dollars each of those sources provided to the objective of nonpoint source pollution management. From Table 5, Figure 5 was created. Figure 5 lists a few of the more notable programs and sources of funding and the amount which was devoted to nonpoint source pollution management both in FFY2014 and FFY2018. 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 nonpoint source pollution will continue. As is the case with natural

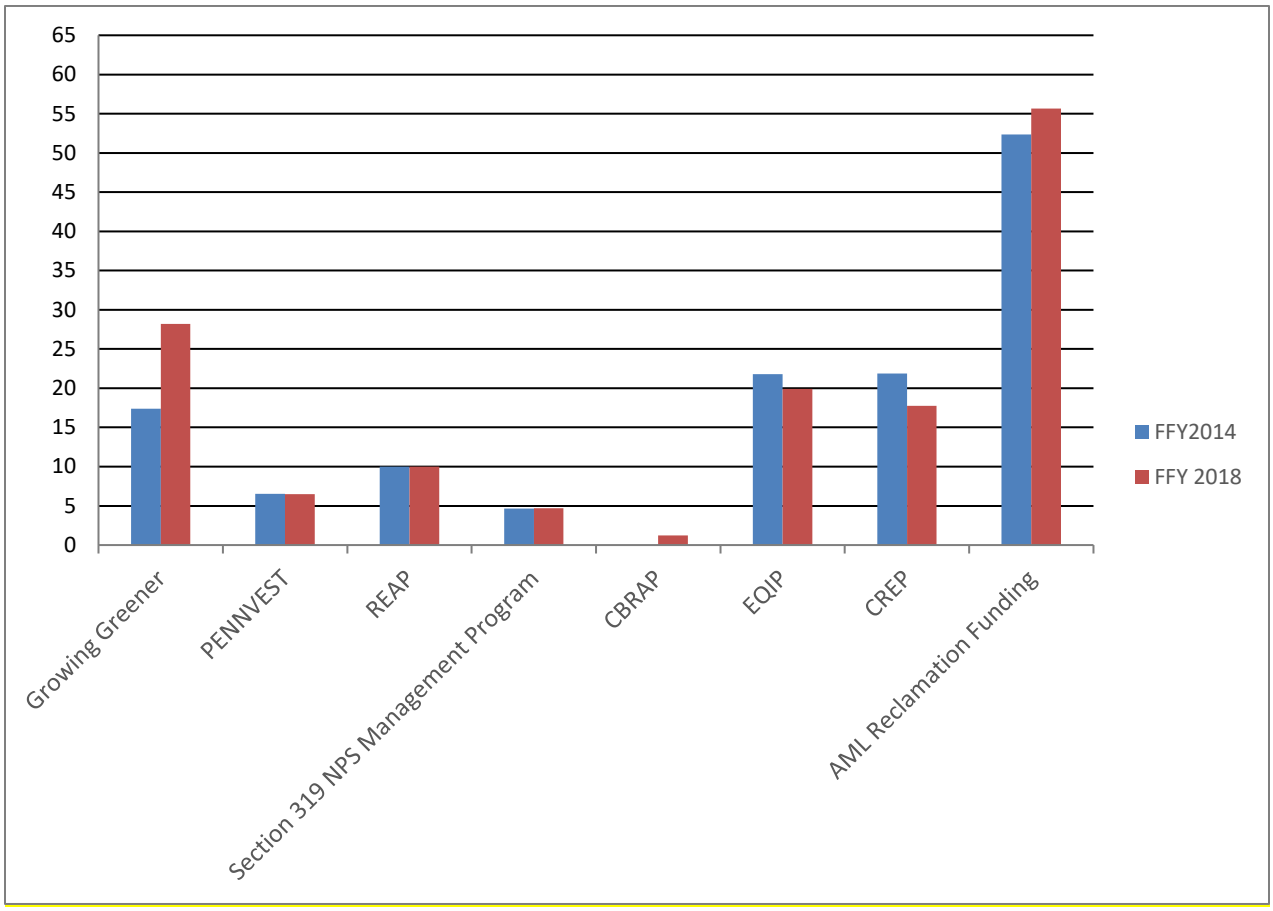
ecosystems, diversity fosters stability, so too with the nonpoint source pollution management effort within Pennsylvania.

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 Management Program Annual Report prepared by DEP. Quantities listed are in millions of U.S. dollars.

Five-Year Listing of Funding by Program and Entity

Entity and Program	FFY2014	FFY2015	FFY2016	FFY2017	FFY2018
DEP – Conservation District Watershed Specialist	2.136	2.178	2.155	2.616	2.9
DEP – Environment Stewardship and Watershed Protection NPS Management Grants (Growing Greener):	17.393	21.225	18.169	20.715	28.29
DEP – Surface Mining Conservation and Reclamation Grant:					
DEP – AMD set-aside Grants	2.0310	1.193	0.069	0.069	1.37
DEP and PDA - Conservation District Fund Allocation Program	7.125	7.125	7.315	7.265	7.223
DEP – Dirt, Gravel and Low Volume Roads Pollution Prevention Program	26.068	26.068	26.068	26.068	26.068
DEP and PDA - Nutrient Management Fund	2.714	2.714	2.714	2.714	2.714
PA Infrastructure and investment Authority (PENNVEST)	6.523	10.593	11.247	4.837	6.481
PA Resource Enhancement and Protection Tax Credits Available	10	10	10	10	10
PA Commonwealth Financing Authority Act 13 NPS Funding (WR and AMD Projects)	3.147	0	2.725	0	2.494
EPA – Section 319 NPS Management Program	4.672	4.585	4.643	4.802	4.708
EPA – CBIG Technical and Engineering Assistance	2.925	3.049	NA	0.691	0.186
EPA – CBIG Special Projects:	0.666	1.512	1.520	1.436	NA
EPA – CBRAP	0	0	3.430	1.201	1.214
NFWF – Chesapeake Bay Small Watershed Grant-annual Funding	0.553	1.075	1.073	1.635	1.007
NFWF – Chesapeake Bay Innovative Nutrient and Sediment Reduction Grant	1.916	1.899	3.075	4.344	3.618
NRCS – Ag Management Assistance	1.080	0.36	0	0.66	0.40
NRCS – Environmental Quality Incentive Program	21.790	20.100	19.929	24.15	19.90
NRCS – Conservation Stewardship Program (new contracts)	0.350	2.92	0.002	1.09	1.35
NRCS – Conservation Stewardship Program (funds obligated to pay on prior year contracts)	6.180	2.64	5.457	4.91	5.40
NRCS – Wetlands Reserve Program	0	0	0	0	0.13
FSA – Conservation Reserve Enhancement Program	21.885	20.484	19.674	18.178	17.769
FSA – Grassland Reserve Program	0.150	0.145	0.334	0.075	0.089
OSMRE – AML Reclamation Funding	52.369	44.018	42.982	35.555	55.658
TOTAL:	191.673	183.883	182.581	173.029	198.696

Figure 5: A comparison of funding allocated to certain nonpoint source pollution-focused programs in FFY2014 and FFY2018. The dark, horizontal bars represent FFY2014 and the light cross-hatched bars represent FFY2018. The unit of measure on the Y-axis is millions of U.S. Dollars.



Most of the programs listed in Table 5 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. 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 HQ and EV, 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 nonpoint source pollution issues. Implementation of these programs requires the use of funds in which a significant portion is allocated to DEP from the Commonwealth's available financial resource each year as the state legislature reviews and approves the budget.

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

Figure 6: A display of the relative amount of funds from multiple state and federal entities as those funds were reported in FFY2014 and having been declared as focused on nonpoint source pollution abatement.

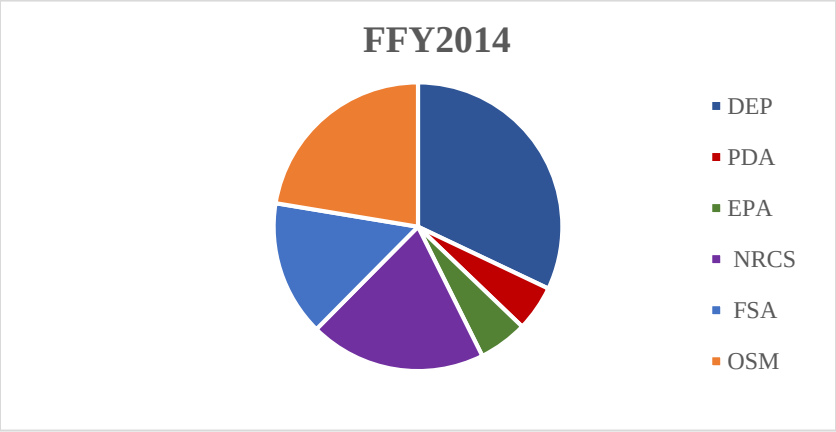


Figure 7: A display of the relative amount of funds from multiple state and federal entities as those funds were reported in FFY2015 and having been declared as focused on nonpoint source pollution abatement.

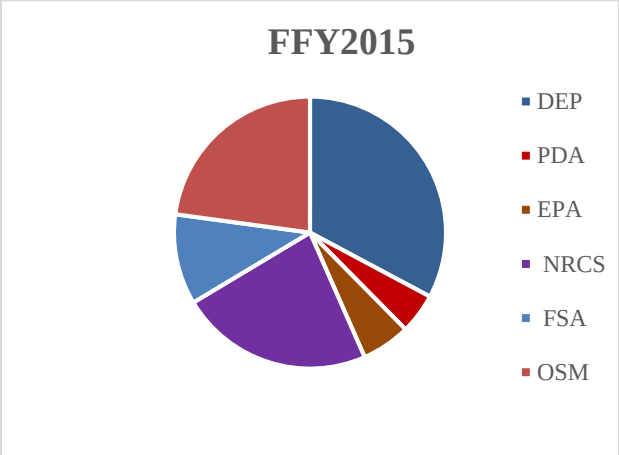


Figure 8: A display of the relative amount of funds from multiple state and federal entities as those funds were reported in FFY2016 and having been declared as focused on nonpoint source pollution abatement

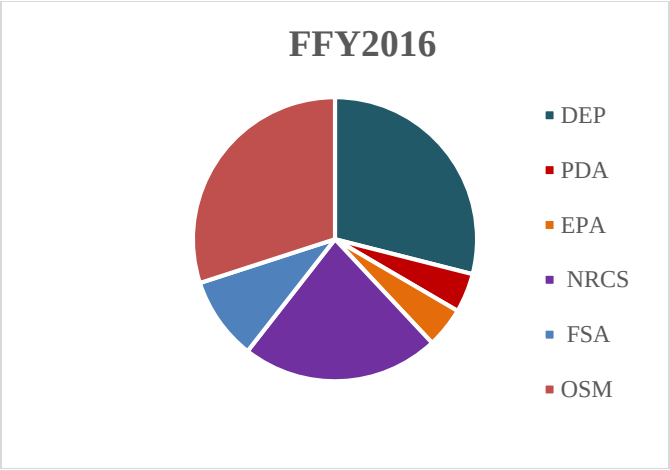


Figure 9: A display of the relative amount of funds from multiple state and federal entities as those funds were reported in FFY2017 and having been declared as focused on nonpoint source pollution abatement.

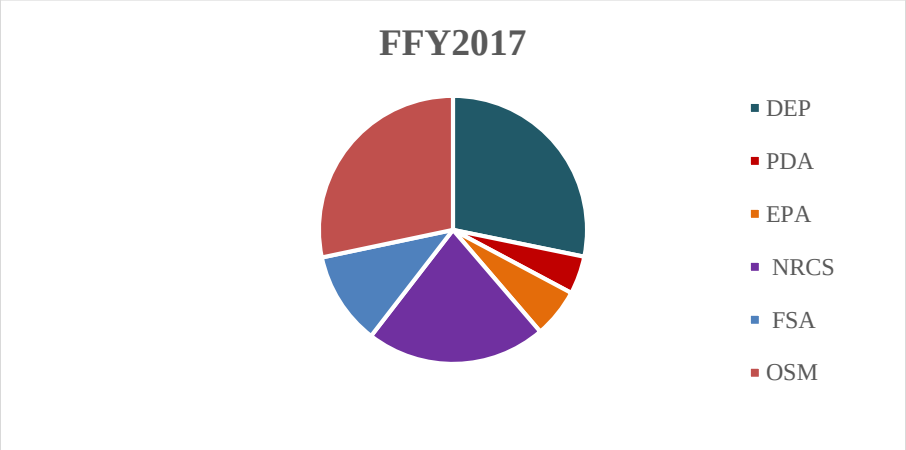
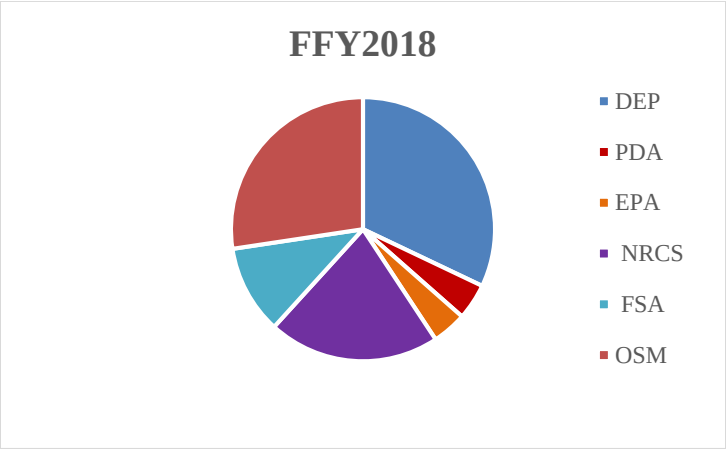


Figure 10: A display of the relative amount of funds from multiple state and federal entities as those funds were reported in FFY2018 and having been declared as focused on nonpoint source pollution abatement.



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. DEP, through the efforts of expansive inspection, permitting, compliance, and enforcement services in association with other sections of DEP whose focus is assessment and monitoring, works 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 Report*. The Integrated Report satisfies CWA Sections 303d and 305b. DEP conducts physical, chemical, and biological assessments of both lakes and streams utilizing DEP established criteria to assess these waterbodies.

While DEP remains the primary source of water resource assessment and classification in Pennsylvania, program partners such as CCDs and citizen groups 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 complete understanding of the status of certain water resources. Information regarding DEP's Assessment Methodology for Rivers and Streams can be found at:

http://files.dep.state.pa.us/Water/Drinking%20Water%20and%20Facility%20Regulation/WaterQualityPortalFiles/Methodology/2015%20Methodology/Assessment_Book.pdf

VIII. Baseline Requirements

Within the Commonwealth, the programs that most likely address, either directly or indirectly, nonpoint sources of pollution include: the CAFO and CAO programs; the NPDES as it pertains to stormwater runoff from new construction sites; the 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; the Coastal Zone Management Program; and the enforcement of the PA Clean Streams Law.

The above listed programs, as well as others referenced throughout this document, are incorporated into the NPS Management Plan based on the baseline requirements of those programs to the extent that they are relevant. For example, a coastal state or territory with an approved coastal zone management program incorporates its approved state coastal nonpoint source pollution control programs required by Section 6217 of the Coastal Zone Act Reauthorization Amendments (CZARA) of 1990, into its NPS Management Program since CZARA requires implementation through the state's NPS Management Program. In this manner, the state ensures that this program and other relevant baseline programs are integrated into, and consistent with, 319 programs.

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 nonpoint source pollution, the implementation of WIPs, the education of citizens, and the monitoring and assessment of the water resources.

DEP continues to encourage sub-grantees under the 319 Program to focus the use of those funds on design of BMPs proposed in EPA approved WIPs followed by construction of those BMPs. 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 so that program funds will be used in the most efficient manner and so project costs will be less susceptible to changing economic conditions.

X. Programmatic Review

Pennsylvania's NPS Source Management Program undergoes an evaluation annually. The Annual Report associated with this program is reviewed by EPA and is only one component of the Satisfactory Progress Determination process by which EPA annually assesses the success of Pennsylvania's NPS Source Management Program.

Modeling of load reductions has become an increasingly more common means by which pollutant load reductions can be estimated and by which proposed projects are evaluated. Modeling occurs both during

the project planning process and during the project tracking process where modeled load reductions are stored in EPA's GRTS database. As DEP engages in monitoring of the water resource and bi-annually produces the Integrated Report, an environmental assessment of program effectiveness is made. When appropriate, modeling and monitoring data culminate in the production of Success Stories produced by Pennsylvania's NPS Management Program and submitted to EPA.

At the request of EPA, an independent review of Pennsylvania's NPS Management Program is being performed and will be completed in 2020. It is anticipated that, pending successful completion of that review, insights garnered from that review will be incorporated by DEP into a mid-point update of this NPS Management Plan. As such, an update to the NPS Management Plan is anticipated for 2023.

XI. Appendices

Appendix A: Tracking Table

Appendix B: List of Acronyms

Appendix A-Tracking Table

Goal	Objective	FFY 2020	FFY 2021	FFY 2022	FFY 2023	FFY 2024
		Actual Amount Achieved				
Improve and protect the waters of the Commonwealth from nonpoint source pollution associated with acid mine drainage (AMD) 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 AML each year for the next five years.					
	1.3 Provide funding and other assistance for the installation new AMD treatment systems annually for the next five years.					
	1.4 Authorize four Quick Response projects each year for the next five years.					
	1.5 Provide engineering assistance under the Technical Assistance Grant for one AMD project each year for the next five years.					
	1.6 Plug five oil and gas wells each year for the next five years.					
	1.7 Through load-reduction efforts with the installation new AMD treatment systems, an additional 10,000 pounds of iron will be reduced from the nonpoint source pollutant stream each year.					
	1.8 Through load-reduction efforts with the installation of new AMD treatment systems, an additional 5,000 pounds of aluminum will be reduced from the nonpoint source pollutant stream each year.					
	1.9 Through load-reduction efforts with the installation new AMD treatment systems, an additional 80,000 pounds of acidity will be reduced from the nonpoint source pollutant stream each year.					
	1.10 Through load-reduction efforts with the current operational passive treatment systems, 15,000,000 pounds of iron will continue to be reduced from the nonpoint source pollutant stream each year.					
	1.11 Through load-reduction efforts with the current operational passive treatment systems, 2,500,000 pounds of aluminum will continue to be reduced from the nonpoint source pollutant stream each year.					

Goal	Objective	FFY 2020	FFY 2021	FFY 2022	FFY 2023	FFY 2024
		Actual Amount Achieved				
	1.12 Through load-reduction efforts with the current operational passive treatment systems, 15,000,000 pounds of acidity will continue to be reduced from the nonpoint source pollutant stream each year.					
	1.13 Through load-reduction efforts with state operated active treatment systems, 750,000 pounds of iron will continue to be reduced from the nonpoint source pollutant stream each year.					
	1.14 Through load-reduction efforts with state operated active treatment systems, 175,000 pounds of aluminum will continue to be reduced from the nonpoint source pollutant stream each year.					
	1.15 Through load-reduction efforts with state operated active treatment systems, 2,500,000 pounds of acidity will continue to be reduced from the nonpoint source pollutant stream each year.					
	1.16 Through load-reduction efforts with state operated active and passive treatment systems, 10 billion gallons per year (BGY) of water will be treated reducing nonpoint source pollutants entering waters of the Commonwealth each year.					
	1.17 Provide technical assistance under the Technical Assistance Grant for 15 AMD projects each year for the next five years.					
Improve and protect the waters of the Commonwealth from nonpoint source pollution associated with agricultural activities.	2.1 Implement BMPs on 30 agricultural operations per year using state directed funds. These BMPs will be for the mitigation of soil loss and/or wise management of nutrients.					
	2.2 Support the review of 30 Nutrient Credit total trades documenting the purchase of nutrient and/or sediment credits annually.					
	23 Conduct 2,000 agricultural compliance inspections on farms in the Chesapeake Bay Watershed each year					
	2.4 Provide six FTEs under the Technical Assistance Grant for designing and installing Ag BMPs.					
	2.5 Support a minimum of 32 Chesapeake Bay Program Agricultural Technicians and eight Agricultural Engineers in the Chesapeake Bay watershed each year for the next five years.					

Goal	Objective	FFY 2020	FFY 2021	FFY 2022	FFY 2023	FFY 2024
		Actual Amount Achieved				
	2.6 Provide support for the implementation of five innovative environmental technology projects (focused on agriculture) within the next five years.					
	2.7 Support the certification of 500 certified manure haulers within the Commonwealth annually.					
	2.8 Support the certification of 200 certified Nutrient Management Specialists within the Commonwealth annually.					
	2.9 Maintain the implementation of approved Act 38 Nutrient Management Plans on 200,000 acres of farmland regulated as CAOs and CAFOs each year for the next five years.					
	2.10 Support 750,000 acres of non-CAO/non-CAFO farmed acres under an NMP or MMP over the next five years.					
	2.11 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.					
	2.12 Provide engineering assistance under the TAG Grant for 35 Agricultural projects each year for the next five years.					
	2.13 Continue to implement PA's Chesapeake Bay WIP over the next five years.					
Improve and protect the waters of the Commonwealth from nonpoint source pollution associated with stormwater runoff, as well as streambank and shoreline degradation.	3.1 Conduct 500 inspections under the Chapter 105 and 8,000 inspections under the 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 Implement five new green infrastructure/volume reduction/flood mitigation projects over the next five years.					
	3.4 Implement 30 new, state-funded riparian buffer, stream restoration and/or stormwater management projects annually for the next five years.					
	3.5 Address 350 new DGLV Road projects each year for the next five years.					

Goal	Objective	FFY 2020	FFY 2021	FFY 2022	FFY 2023	FFY 2024
		Actual Amount Achieved				
	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 50,000 acres of new land in the CREP program over the next five years.					
	3.8 Plant and protect 2,500 acres of riparian forest buffer for the next five years.					
	3.9 Develop 30 new forest stewardship plans each year that cover approximately 5000 acres of privately-owned forest land over the next five years.					
	3.10 Plant 10,000 new trees under the TreeVitalize program over the next five years.					
	3.11 Encourage nonpoint source pollution control activities within U.S. 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."					
	3.12 Provide engineering assistance under the Technical Assistance Grant for four Stream Restoration Projects each year for the next 5 years.					
	3.13 Provide technical assistance under the Technical Assistance Grant for 15 nonpoint source pollution management projects each year for the next five years.					
Verify the efficacy of Pennsylvania's nonpoint source pollution management efforts through enhanced data collection.	4.1 Continue 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 Management Program to collect the number of 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.					

Goal	Objective	FFY 2020	FFY 2021	FFY 2022	FFY 2023	FFY 2024
		Actual Amount Achieved				
	4.4 Ensure that the Datashed GIS web tool adequately describes available information relating to the approximate 250 AMD Treatment Systems sites that are treating mine discharges across Pennsylvania and ensure that access to this information is available to the public.					
	4.5 Through the implementation and maintenance of the Water Quality Monitoring Network (WQN), the DEP will perform a combined total of 6,000 samples and surveys each year over the next five years.					
	4.6 In addition to other monitoring efforts, the DEP will monitor 30 lakes each year for the next five years.					
	4.7 Through monitoring and assessment efforts conducted by the DEP, over the next five years, 400 miles of streams previously impacted by nonpoint source pollution 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 the DEP, over the next five years, 900 lake acres previously impacted by nonpoint source pollution 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 Continue to input all monitoring data collected by the PA DEP NPS Management Program into the WQX System.					
	4.11 Through state-wide nonpoint source pollutant load-reduction efforts, 1 million pounds of nitrogen will be reduced from the nonpoint source pollutant stream each year.					
	4.12 Through state-wide load-reduction efforts, 300,000 pounds of phosphorus will be reduced from the nonpoint source pollutant stream each year.					

Goal	Objective	FFY 2020	FFY 2021	FFY 2022	FFY 2023	FFY 2024
		Actual Amount Achieved				
	4.13 Through statewide load-reduction efforts, 200,000 tons of sediment will be reduced from the nonpoint 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.					
	4.15 Complete development of and maintain DEP's 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.					
	4.16 DEP will continue to collect and report on the amount of biosolids land applied following the water quality criteria established under DEP's Municipal Waste regulations.					
	4.17 Document farmer compliance with agricultural erosion and sediment control and manure management regulations in the Chesapeake Bay watershed by augmenting the long-standing Act 38 and CAFO inspection programs with the Chesapeake Bay enhanced inspection program addressing the non-CAO/non-CAFO farms, inspecting 5% of the farmlands in the watershed annually until all acres have been assessed.					
Demonstrate Pennsylvania's nonpoint source pollution management efforts through enhanced data dissemination efforts.	5.1 Annually provide a clear and concise report to the EPA, the general public, regulators, partners and others interested in Pennsylvania's nonpoint source pollution abatement efforts outlining the major accomplishments of Pennsylvania's NPS Management Program consistent with EPA reporting guidelines.					
	5.2 Develop two "Success Stories" per year.					
	5.3 Provide detailed BMP implementation reporting on 10 approved WIPs per year.					
	5.4 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.					

Goal	Objective	FFY 2020	FFY 2021	FFY 2022	FFY 2023	FFY 2024
		Actual Amount Achieved				
	5.5 DEP will continue to input current information in the Watershed Plan Tracker throughout the five-year life of this Plan to ensure accuracy of data.					
Develop and update watershed plans leading to the improvement and protection of the waters of the Commonwealth from nonpoint source pollution.	6.1 Develop five new NPS WIPs over the next five years.					
	6.2 Update five existing WIPs over the next five years.					
	6.3 Detailed review of current WIPs over the next five years.					

Appendix B-Acronyms and Abbreviations

ACOE	United States Army Corps of Engineers
AMD	Acid Mine Drainage
AMLIS	Abandoned Mine Land Inventory Sites
ANF	Allegheny National Forest
BAMR	Bureau of Abandoned Mine Reclamation
BDMO	Bureau of District Mining Operations
BGY	billion gallons per year
BMP	Best Management Practice
CAFO	Concentrated Animal Feeding Operation
CAP	Countywide Action Plan
CAO	Concentrated Animal Operation
CCD	County Conservation District
CFA	Commonwealth Financing Authority
Chesapeake Bay WIP	The Chesapeake Bay Watershed Implementation Plan (not to be confused with Section 319 approved WIPs drafted for very specific priority watersheds approved by EPA within the Commonwealth)
CREP	Conservation Reserve Enhancement Program
CWA	Clean Water Act
DCED	Pennsylvania Department of Community and Economic Development
DCNR	Pennsylvania Department of Conservation and Natural Resources
DEP	Pennsylvania Department of Environmental Protection
DE	Delaware
DOD	United States Department of Defense
DOI	Unites States 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 Maintenance
E&S	Erosion and Sediment
EV	Exceptional Value
FEMA	Federal Emergency Management Agency
FFY	Federal Fiscal Year
FSA	Farm Service Agency
FTE	Full Time Equivalent

GIS	Geographic Information System
GRTS	Grants Reporting and Tracking System
HQ	High Quality
IPM	Integrated Pest Management
MD	Maryland
MOU	Memorandum of Understanding
MS4	Municipal Separate Storm Sewer
Mt.	Mount or Mountain
NFWF	National Fish and Wildlife Foundation
NGO	Non-Government Organization
NJ	New Jersey
NOAA	National Ocean and Atmospheric Agency
NPDES	National Pollution Discharge Elimination System
NPS	Nonpoint Source
NRCS	National Resource Conservation Service
O&M	Operation and Maintenance
OM&R	Operation, Maintenance, and Replacement
OSMRE	Office of Surface Mining Reclamation and Enforcement
PA	Pennsylvania
PACD	Pennsylvania Association of Conservation Districts
PATU	Pennsylvania Council of Trout Unlimited
PCSM	Post Construction Stormwater Management
PDA	Pennsylvania Department of Agriculture
PennDOT	Pennsylvania Department of Transportation
PGC	Pennsylvania Game Commission
PSU	Penn State University
RAMLIS	Reclaimed Abandoned Mine Land Inventory System
RBP	Rapid Bioassessment Protocol
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
TAG	PACD Engineering Technical Assistance Grant

TMDL	Total Maximum Daily Load
USDA	United States Department of Agriculture
USFS	United States Forest Service
USGS	United States Geological Service
USNPS	United States National Parks Service
WIP	Watershed Implementation Plan
WPCAMR	Western Pennsylvania Coalition for Abandoned Mine Reclamation
WPT	Watershed Plan Tracker

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