

DEPARTMENT OF ENVIRONMENTAL PROTECTION (DEP)
Bureau of Watershed Management

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TITLE: Pennsylvania's Nonpoint Source Management Program Update

EFFECTIVE DATE: October 11, 2008

AUTHORITY: Section 319(b) of the Federal Water Pollution Control Act (Clean Water Act) as amended by P.L. 100-4 on February 4, 1987

POLICY: The *Pennsylvania Nonpoint Source Management Program Update* outlines the Commonwealth's plan to address nonpoint source (NPS) pollution through 2012 based on having adequate resources including necessary personnel. This update enhances Pennsylvania's NPS Management Program approved by the U.S. Environmental Protection Agency in 1999.

PURPOSE: Section 319 requires each state to prepare an assessment report and a management plan for the state NPS Management Program in order to be eligible for funding from the U.S. Environmental Protection Agency to implement provisions of the management plan. This plan also establishes the overall strategy Pennsylvania will use to implement the watershed protection aspects of Pennsylvania's Growing Greener program.

APPLICABILITY: NPS pollution is generally caused by stormwater runoff across the land. Water also infiltrates into the ground. Therefore NPS pollution also occurs from infiltration of pollutants into the groundwater. The three largest sources of NPS pollution in Pennsylvania are agriculture, abandoned mining activities and urban runoff. Other sources of NPS pollution in Pennsylvania include abandoned oil and gas wells, construction activities, onlot sewage systems, leachate from illegal dumps, hydromodification and silviculture (forestry).

DISCLAIMER: The policies and procedures outlined in this guidance are intended to supplement existing requirements. Nothing in the policies or procedures shall affect regulatory requirements.

The policies and procedures herein are not an adjudication or a regulation. There is no intent on the part of DEP to give the rules in these policies that weight or deference. This document establishes the framework within which DEP will exercise its administrative discretion in the future. DEP reserves the discretion to deviate from this policy statement if circumstances warrant.

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INTRODUCTION

Pennsylvania's NPS Management Program was developed in response to the 1987 Clean Water Act, Section 319 ("Section 319") provisions to address problems caused by pollution from NPSs. Unlike point source pollution, which comes from a pipe, the causes of NPS pollution cannot be easily defined or quantified. Sometimes referred to as "polluted runoff," NPS pollution is generally caused by stormwater runoff across the land. Water also infiltrates into the ground. Therefore NPS pollution also occurs from infiltration of pollutants into the groundwater. The three largest sources of NPS pollution in Pennsylvania are agriculture, abandoned mining activities and urban runoff. Other sources of NPS pollution in Pennsylvania include abandoned oil and gas wells, construction activities, onlot sewage systems, leachate from illegal dumps, hydromodification and silviculture (forestry).

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

Section 319 requires each state to update its comprehensive plan to manage NPS pollution. Pennsylvania last updated its NPS Plan in 1999. The 1999 Update expanded and enhanced Pennsylvania's 1992 NPS Management Program and included a variety of regulatory, nonregulatory, financial and technical assistance programs needed to improve and maintain surface and groundwater quality.

DEP has received approximately \$56 million from the Section 319 Grant Program (FY 90 through FY 04). This money has been used to institutionalize an NPS program in Pennsylvania, implement various innovative technologies to treat NPS pollution problems, develop an educational program and begin several comprehensive watershed initiatives.

The *Pennsylvania Nonpoint Source Management Program Update* outlines the Commonwealth's plan to address NPS pollution through 2012 based on having adequate resources including necessary personnel. This update enhances Pennsylvania's NPS Management Program approved by EPA in 1999 in compliance with Section 319(b) of the Federal Water Pollution Control Act (Clean Water Act) as amended by P.L. 100-4 on February 4, 1987. This plan also establishes the overall strategy Pennsylvania will use to implement the watershed protection aspects of Pennsylvania's Growing Greener program.

NPS pollution or "polluted runoff" washes off parking lots, fields and other surfaces into the waters of the Commonwealth. Pennsylvania's 2004 Integrated Monitoring and Assessment Report indicates that abandoned mine drainage (AMD) and agricultural runoff are the two leading sources of NPS pollution in Pennsylvania. Other sources of polluted runoff in Pennsylvania include: construction/urban runoff, hydrologic and habitat modifications, land disposal (onlot sewage systems) and silviculture. These, and Section 314 Clean Lakes Program projects, are all approved by EPA as eligible for Section 319 funding.

This NPS Program Update expands and enhances Pennsylvania's 1999 NPS Management Program and includes a variety of regulatory, nonregulatory, financial and technical assistance programs needed to

improve and maintain surface and groundwater quality. Section I contains Pennsylvania's strategy for NPS program implementation, including the goals, objectives and action items to address NPSs of pollution. Section II outlines statewide programs that address specific NPS pollution categories. Section III describes Pennsylvania's Watershed Management Programs, including information on Pennsylvania's four national monitoring projects. Section IV provides an overview of the Commonwealth's regulatory programs related to NPS control.

This updated NPS Management Program has been prepared in conjunction with the Pennsylvania NPS Liaison Work Group. This work group consists of local, state and federal partners representing over 45 public and private organizations. The NPS Liaison Work Group has worked diligently to provide input into this NPS Management Program. DEP's NPS Management Section appreciates the time, effort and expertise members of the Liaison work group have generously provided. Special thanks to the many citizens and watershed groups whose valuable suggestions have also been incorporated.

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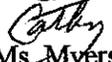
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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION III
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Philadelphia, Pennsylvania 19103-2029

SEP 17 2008

Ms. Cathy Curran Myers
Deputy Secretary for Water Management
Pennsylvania Department of Environmental Protection
Rachel Carson State Office Building
Harrisburg, Pennsylvania 17105-2063


Dear Ms. Myers:

On behalf of the Environmental Protection Agency (EPA) I commend the Pennsylvania Department of Environmental Protection (PADEP) for the continued commitment to reduce and prevent non-point source pollution across the Commonwealth. The recently updated Pennsylvania Nonpoint Source (NPS) Management Program dated July 2008 is a testament to the strength of the partnerships forged with a diverse array of agencies and organizations working together to implement the NPS program. Pennsylvania ranks as the first State in the Region to update a NPS Management Plan.

The liaison workgroup, charged with bringing ideas, resources to the program, involved over 30 agencies and organizations and is supported by over 50 individuals. This multiyear effort demonstrates the level of commitment the liaison workgroup has to the NPS program. The resulting set of goals and activities in the updated NPS Management Plan reflect high priority environmental protection needs and the common values of a diverse group of stakeholders.

The NPS Management Plan describes wholesale approaches, sector strategies, objectives and actions that, when implemented through the Watershed Implementation Plans, provide the necessary tools to achieve the goal of restoring 500 miles of stream and 1600 acres of lakes to reduce nonpoint source loadings throughout the Commonwealth. And, with additional emphasis on approaches to protect special protection waters, this clearly establishes Pennsylvania as a leader in protecting Healthy Waters. Therefore, I am approving the updated 2008 Pennsylvania NPS Management Program. I look forward to continuing our work together with the Regional Healthy Waters Priority to help achieve our common goals.

Sincerely,



Jon M. Capacasa, Director
Water Protection Division

I. PENNSYLVANIA'S NPS MANAGEMENT PROGRAM

PENNSYLVANIA'S NPS STRATEGY

Pennsylvania's NPS Strategy is based on the visions of DEP and the NPS Liaison Work Group. It utilizes the following *five goals and related objectives* to establish flexible, targeted, interactive approaches to achieving and maintaining designated and existing beneficial uses of the waters of the Commonwealth as resources allow. This strategy includes establishing environmental measures and indicators of progress and success. The environmental results will be measured by water quality improvements, NPS pollution load reductions and milestones. Only those objectives that can be quantified or progress measured are included in this section. Progress will be evaluated each year in an annual report.

Many actions cannot be measured in definitive ways, such as through public education, awareness and actions, but are still important in our strategy. To view all objectives and supporting action items developed by the NPS Liaison Work Group, please go to the specific NPS Management Program categories in Section II (Resource Extraction, Agriculture, Construction/Urban Runoff, Silviculture, Land Disposal, Hydromodification and Lakes).

A. NPS Vision

According to the NPS Liaison Work Group's Vision Statement, Pennsylvania's NPS Management Program, through partnerships with the citizens, agencies, and industries of the Commonwealth, will work to achieve appropriate water quality standards and protect beneficial uses of all surface and groundwater. To do this, the NPS Management Program will be used as a tool to control, prevent and remediate NPS pollution as resources allow.

B. Goals

Pennsylvania's NPS Program Update is organized around **five key goals**:

Goal 1

Improve and protect water resources as a result of NPS Management Program implementation efforts. Show water resource improvements by measuring reductions in sediments, nutrients, and metals or increases in aquatic life use, riparian habitat, wetlands, or public health benefits. By 2012, through combined program efforts, remove 500 miles of streams and 1,600 lake acres that are identified on Pennsylvania's Integrated List of All Waters as being impaired because of NPSs of pollution.

Goal 2

Coordinate with county conservation districts, watershed groups, local governments, and others in the development and implementation of 34 watershed implementation plans (WIPs) meeting EPA's Section 319 criteria to protect and restore surface and groundwater quality by 2012.

Goal 3

Improve and develop monitoring efforts to determine how projects and programs improve water quality and/or meet target pollution reductions including Total Maximum Daily Loads (TMDLs).

Goal 4

Encourage development and use of new technologies, tools, and technology transfer practices to enhance understanding and use of techniques for addressing NPS pollution.

Goal 5

Assure implementation of appropriate Best Management Practices (BMPs) to protect, improve, and restore water quality by using or enhancing existing financial incentives, technical assistance, education, and regulatory programs.

C. Measurable Objectives to Address Goals

The primary reporting and tracking methodology used by the Section 319 NPS program is the Grants Reporting and Tracking System (GRTS). This database reports on several aspects of the Section 319 program, including environmental results, project and grant data, NPS pollutant load reductions, and utilization of Section 319 NPS program funds.

Sediment, nitrogen and phosphorus are the three required water quality impairment parameters for which we report load reduction estimates in GRTS. Following EPA Region 3 Section 319 program guidance, Pennsylvania reports current progress in reducing sediment and nutrient loads to surface waters where NPS implementation projects are being funded. We utilize the GRTS database and associated pollutant load reduction models, i.e. Spreadsheet Tool for Estimating Pollutant Loads (STEPL), as a tool to measure the success of our NPS implementation program. We keep this data current and incorporate GRTS data in the NPS Annual Report.

This database and reports generated from it are tools used for reporting performance to EPA Region 3. The GRTS database helps Pennsylvania document satisfactory progress in meeting program guidance and NPS implementation grant conditions.

All of the objectives listed below have defined endpoints - for example, a certain number of something achieved or a specific action finished by a certain date. This is important so that program goals/objectives and our yearly progress (reported through the annual report) can be easily tracked. Each of these objectives is identified with the specific NPS category work group(s) that contributed it.

Pennsylvania's NPS Liaison Work Group participants provide the NPS Management Program with environmental results and accomplishments from their respective programs. The agriculture, resource extraction, hydromodification, land disposal, silviculture (forestry), lakes and construction/urban runoff work groups communicate their respective environmental results to the NPS Management Program through

semiannual NPS Liaison Work Group meetings. Environmental results are an important part of Pennsylvania's NPS Annual Report to the EPA.

Goal 1

Improve and protect water resources as a result of NPS Management Program implementation efforts. Show water resource improvements by measuring reductions in sediments, nutrients, and metals or increases in aquatic life use, riparian habitat, wetlands, or public health benefits. By 2012, through combined program efforts, remove 500 miles of streams and 1,600 lake acres that are identified on Pennsylvania's Integrated List of All Waters as being impaired because of NPSs of pollution.

By the end of 2009

- If resources allow, reclaim 2,500 acres of Abandoned Mine Lands (AML). (Resource Extraction)
- Increase the modification for fish passage or removal of dams from seven to ten per year. (Hydromodification)
- Design and construct one flood protection project utilizing Natural Stream Channel Design (NSCD) measures to minimize ecological impacts. (Hydromodification)

By the end of 2010

- Develop a strategy for supporting watershed restoration by methods other than direct public funding, such as targeting public and private mitigation efforts in high priority watersheds.

By the end of 2012

- If resources allow, restore 100 stream miles to designated uses by improving aquatic habitats to support fish and associated aquatic life in streams impaired by AMD. (Resource Extraction)
- Plug 1,100 of the 6,600 known abandoned oil and gas wells to improve water quality, eliminate safety hazards, and eliminate pollution resulting from uncontrolled discharges into ground and surface water, contingent on having adequate resources. (Resource Extraction)
- Develop a comprehensive Pennsylvania Lake Classification and Lake Criteria System, and remove from the Pennsylvania's Integrated List of All Waters those lakes that have good water quality and meet designated lake uses but violate stream-based criteria. (Lakes)
- Track agricultural BMP implementation and estimate load reductions in sediment and nutrients. Track designated use attainment in watersheds where agriculture is the major source of impairment. Further develop or refine the existing

Section 319 NPS GRTS database to collect this information on a watershed basis.
(Agriculture)

- Through the combined efforts of all NPS categories and the implementation of 34 WIPs, restore up to 400 additional miles of streams to designated uses by improving aquatic habitats to support fish and aquatic life.

Goal 2

Coordinate with county conservation districts, watershed groups, local governments, and others in the development and implementation of 34 WIPs meeting EPA's Section 319 criteria to protect and restore surface and groundwater quality by 2012.

By the end of 2009

- Develop 16 integrated WIPs that incorporate AMD/AML Assessments
- Develop Operation, Maintenance and Replacement plans and proposed funding sources for existing AMD remediation projects and restoration projects as resources allow. (Resource Extraction and Hydromodification)
- Involve county conservation districts, municipal officials, county planning officials, local stakeholders, watershed groups, and other local groups in designing and implementing communication and outreach efforts. (Construction/Urban)

By the end of 2012

- Increase local agricultural producers' involvement in watershed planning and implementation efforts. (Agriculture)
- Continue to provide technical assistance to local watershed organizations to develop and implement WIPs in priority watersheds by providing funding through Section 319 grants.
- Achieve load reductions and water quality goals identified in four (4) WIPs.

Goal 3

Improve and develop monitoring efforts to determine how projects and programs improve water quality and/or meet target pollution reductions including TMDLs.

By the end of 2008

- Increase the accessibility of local, state and regional water quality data to decision makers, watershed organizations and producers to target water quality restoration and protection efforts. (Agriculture)

- Complete 34 WIPs and, using Geographic Information System (GIS) tracking tools and computer models, estimate load reductions already achieved and the number and types of BMPs needed to achieve TMDL targeted load reductions.
- Establish a monitoring protocol and related training for measuring environmental results of implementing NSCD projects. (Hydromodification)

By the end of 2009

- Establish local water-quality monitoring sites to both obtain baseline water quality data and assess the effectiveness of agricultural BMPs. (Agriculture)

By the end of 2012

- Fully utilize the GRTS to report pollutant load reduction estimates for Pennsylvania's NPS implementation program.

Goal 4

Encourage development and use of new technologies, tools, and technology transfer practices to enhance understanding and use of techniques for addressing NPS pollution.

By the end of 2008

- Assess the feasibility and effectiveness of Pennsylvania's nutrient reduction credit trading program using actual projects underway or completed, such as the Conestoga River Watershed Pilot Project. (Agriculture)
- Facilitate four projects demonstrating market-based opportunities to address agricultural water quality issues. (Agriculture)
- Demonstrate the implementation of technologies and management systems (conservation tillage, composting, etc.) identified to be environmentally sound and economically feasible. (Agriculture)
- Support a strategy to control and mitigate exotic species that affect aquatic life and recreational uses of Pennsylvania water bodies and riparian areas in cooperation with the interagency Aquatic Invasive Species Work Group. (Lakes)

By the end of 2010

- Assess the feasibility of new technology and BMPs to address the nutrient imbalance on agricultural land in PA.

By the end of 2012

- Increase the adoption of cost-effective BMPs to minimize ammonia emissions and protect/improve air quality on 1,000 farms. (Agriculture)

Goal 5

Assure implementation of appropriate BMPs to protect, improve, and restore water quality by using or enhancing existing financial incentives, technical assistance, education, and regulatory programs.

By the end of 2008

- Complete four projects that implement alternative use technologies for spent mushroom substrate (SMS). (Agriculture)
- Prepare and distribute two Farm-A-Syst worksheets for management of pastures and animal concentration areas. (Land Disposal)
- Reclaim at least 400 additional acres of disturbed or degraded lands using biosolids or other recycled by-products. (Land Disposal)

By the end of 2009

- As resources allow, establish a system of long-range planning, technical support, and financial assistance for AMD/AML systems and programs for local governments and watershed groups. (Resource Extraction)
- DEP, Pennsylvania Infrastructure Investment Authority (PENNVEST) and Department of Community and Economic Development (DCED) work cooperatively with industry to develop and implement innovative means for beneficial use of abandoned mine pools and mine discharges. (Resource Extraction)
- Encourage and support the redevelopment of AML for recreational, industrial, commercial and residential uses. (Resource Extraction)
- Support local funding mechanisms to support local training, which will build the technical capacity of county conservation district staff to address NPS problems/challenges. (Agriculture)
- As resources allow, support the Act 167 Program of long-range planning, technical support, and financial assistance for stormwater management systems and programs for local governments. (Construction/Urban)
- Increase the number of regional (inter-municipal, public/private partnership) household hazardous waste (HHW) collections to three or more per year. (Land Disposal)

- Develop and implement a program encouraging rural landowners to clean up farm dumps. (Land Disposal)

By the end of 2010

- Encourage an additional 100 municipalities to develop and update sewage management programs in accordance with Act 537. (Land Disposal)
- Increase the total amount of waste pesticides collected by the Chemsweep program to 4.0 million pounds. (Land Disposal)

By the end of 2012

- Increase use of the PENNVEST Individual Onlot Sewage Disposal System Funding Program for repair and replacement of malfunctioning systems to more than 32 projects per year. (Land Disposal)
- Explore the use of social marketing methods to enhance public awareness of HHW and increase the number of participants in HHW collections to more than 34,000 per year. (Land Disposal)
- Increase farmer participation in the Pennsylvania Environmental Assessment and Conservation Certification of Excellence (PEACCE) program. (Agriculture)
- Maintain and increase nutrient management, soil conservation, and agronomic management educational efforts to producers, program and technical support staff, and agribusiness. (Agriculture)
- Fully implement Pennsylvania's Conservation Reserve Enhancement Program (CREP) in the Susquehanna and Ohio River basins and investigate the possible future expansion of the CREP to include the Delaware River Basin. (Agriculture)
- Increase accessibility to agriculture research data and information on the agriculture-related water and air pollutant mechanisms through workshops, print media and the internet. (Agriculture)
- Facilitate conservation planning and implementation efforts and track conservation planning and implementation to help producers comply with Natural Resources Conservation Service (NRCS) and county conservation district requirements. (Agriculture)
- Develop and implement Mushroom Farm Environmental Management Plans (MFEMPs) on sites utilizing mushroom substrate and SMS. (Agriculture)
- Utilize existing programs to clean up 50 illegal dumps threatening lakes, streams, groundwater or wetlands. (Land Disposal)

II. STATEWIDE PROGRAMS TO ADDRESS SPECIFIC NPS MANAGEMENT PROGRAM CATEGORIES

This section of the NPS Management Program provides a detailed summary of existing statewide programs that include a mix of water quality based and technology based programs, and a variety of regulatory, nonregulatory, financial and technical assistance programs all designed to expeditiously achieve and maintain beneficial uses of water. This section describes the NPS institutionalized implementation programs and identifies measures to be used to control, prevent and remedy NPSs of pollution from the following categories: **resource extraction, agriculture, construction/urban runoff, land disposal, silviculture, hydrologic/habitat modification, and lakes.**

A. Resource Extraction

Past practices of resource extraction and exploration are the major source of NPS pollution to surface and groundwaters 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, and oil and gas deposits are concentrated in the western and northcentral portions of the Commonwealth.

FINANCIAL ASSISTANCE

The Abandoned Mine Reclamation Fund

Until recently, the Abandoned Mine Reclamation Fund (AMR Fund) did not address water quality problems, but focused only on health and safety hazards. Through this fund, thousands of acres of surface mine lands, and many miles of streams clogged with coal mine sediment or degraded by mine drainage have been restored. The fund has paid for restoration initiatives, such as closing and backfilling mine openings and open surface mine pits, including over 84 miles of abandoned surface mine highwalls, stabilizing refuse piles, and preventing infiltration into underground mine workings, and extinguishing or stopping the advance of underground and refuse bank fires.

Historically, the federal Office of Surface Mining (OSM) required that AMR be addressed in a priority manner. Health and safety hazards were considered as Priorities 1 and 2. Acid mine drainage was defined as a Priority 3 problem and did not receive much attention or funding through the AMR Fund. The Bureau of Abandoned Mine Reclamation (BAMR) is committed to doing health and safety projects before general welfare projects. OSM has more recently authorized AMD problems to be funded along with the traditional land reclamation priorities, if it can be demonstrated that the water quality problems present health, safety, or general welfare problems to the community.

An important event in the battle to address AMD occurred in 2006. On December 9, the AML Program was reauthorized in the final hours before Congress adjourned. The AML Reauthorization, which amends the 1977 Surface Mining Control and Reclamation Act (SMCRA), extends the AML Program for at least 15 years and will triple AML funds Pennsylvania receives from reclamation fees collected from every ton of coal produced. In the next 15 years Pennsylvania should receive at least \$1.5 billion to clean up Priorities 1 and 2 AML sites. States can also set aside up to 30% of this funding to

address AMD problems not associated with Priority 1 and 2 sites. This extra funding will increase the amount of AML problems that can be remediated; however, it will not be enough money to address all of the problems in Pennsylvania. To learn more about SMCRA see: <http://www.osmre.gov/index2.htm>.

Ten Percent Set-Aside Program

In 1990, SMCRA was amended to include a provision allowing states to establish an acid mine drainage abatement and treatment program called the AMD Ten Percent Set-Aside Program. The fund and program are managed BAMR.

Money from the Ten Percent Set-Aside Fund may be used to treat AMD and where no continuing reclamation responsibility can be determined. In order to qualify, the water quality must adversely impact biological resources. Another important consideration is the potential for forming partnerships with organized groups active in improving the watershed and with county conservation districts.

This program may increase to as much as a 30% set-aside, as part of the AML Reauthorization explained above.

The Appalachian Clean Streams Initiative (ACSI)

The ACSI was formed in 1995 by the OSM as a regional partnership of federal, state, local, industry, watershed groups, university researchers, and individuals interested in the cleanup of streams degraded by AMD. The initiative provides an opportunity for partnership, coordination, and better results from expenditure of public funds. Note: OSM and BAMR manage separate ACSI programs in PA.

NPS Grants

The Bureau of Watershed Management sponsors passive treatment projects for the remediation of mine drainage pollution with funding through the Section 319 Grant. To learn more about the Section 319 program go to: <http://www.depweb.state.pa.us/watershedmgmt/cwp/view.asp?a=1430&q=482303>.

Growing Greener Grants

The Environmental Stewardship and Watershed Protection Act authorizes DEP to allocate nearly \$547 million in grants for acid mine drainage abatement, mine cleanup efforts, abandoned oil and gas well plugging and local watershed-based conservation projects. These projects can include: watershed assessments and development of watershed restoration or protection plans; implementation of watershed restoration or protection projects (stormwater management wetlands, riparian buffer fencing and planting, streambank restoration including 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 and other municipalities; county conservation districts; watershed

organizations; and other organizations involved in the restoration and protection of Pennsylvania's environment. These grants will support local projects to clean up NPSs of pollution throughout Pennsylvania. To learn more about Growing Greener go to: <http://www.depweb.state.pa.us/growinggreener/site/default.asp>.

TECHNICAL ASSISTANCE

Comprehensive Plan for AMR

BAMR has developed Pennsylvania's Comprehensive Plan for AMR, which establishes a framework for organizing reclamation efforts, coordinating among agencies involved in reclamation, prioritizing expenditures, and decision making.

The plan has as its goals to:

- Focus expenditures for reclamation of AML on maximizing benefits;
- Develop partnerships involving local citizens, local government, and other groups that promote AMR;
- Develop long-term funding sources to allow long-term planning and funding commitments;
- Develop a holistic approach to reclamation planning that will result in reclamation and rehabilitation of an entire geographic area;
- Encourage the development and use of innovative technologies that reduce the cost of reclamation;
- Coordinate the activities of the AML program with the Bureau of District Mining Operations (BDMO) regulatory program so that active mine operators are encouraged to remine and reclaim where possible; and
- Ensure that property owners who allow the use of their lands for long-term treatment of AMD are not subject to personal or environmental liabilities because of the reclamation projects.

PARTNERS

AMR Coalitions

In 1982 county conservation districts in the bituminous coal region of the state formed the Western Pennsylvania Coalition for Abandoned Mine Reclamation (WPCAMR). The Eastern Pennsylvania Coalition for Abandoned Mine Reclamation (EPCAMR) covering the anthracite coal region and the northern bituminous counties was formed in 1996. Combined the coalitions cover 40 counties in Pennsylvania. The coalitions compliment existing DEP remediation programs by taking a community involvement approach and by gearing towards smaller projects. To learn more about the coalitions, go to: <http://amrclearinghouse.org> and <http://www.orangewaternetnetwork.org>.

Mining and Reclamation

The BDMO is responsible for the regulation, permitting, compliance, and reclamation of surface and underground coal, noncoal mining, and coal refuse disposal. Authority is given under the federal SMCRA, Pennsylvania's Clean Streams Law, various other Pennsylvania laws, and implementing regulations.

BDMO is responsible for issuing permits that do not result in pollution during or after mining and ensuring that mining is conducted in compliance with the regulations. In order to prevent degradation from mining, BDMO's permitting program concentrates on improving methods of predicting mine drainage quality and on special mining techniques that are designed to prevent post-mining pollutional discharges. BDMO also initiates and coordinates AMR efforts and is responsible for encouraging re-mining of abandoned mine areas as a means of achieving reclamation.

Oil and Gas Management Programs

The Bureau of Oil and Gas Management (BO&GM), working through the Regional Offices, is responsible for the statewide oil and gas conservation and environmental programs to facilitate the safe exploration, development, and recovery of Pennsylvania's oil and gas reserves in a manner that will protect the Commonwealth's natural resources and the environment. Production of oil and gas currently takes place in over 30 counties. The BO&GM conducts its activities under the authority of several statutes: Pennsylvania's Clean Streams Law, Solid Waste Management Act, Oil and Gas Act, Dams and Encroachment Act, Coal and Gas Resource Coordination Act, Oil and Gas Conservation Law, and Administrative Code.

Activities of the BO&GM include processing well permits, registrations and orphan well determinations; issuing permits for waste water discharges, road spreading of brine for dust control, erosion, and sedimentation; and administering the abandoned and orphan well plugging program.

Since the first commercial oil well was drilled in Pennsylvania in 1859, as many as 250,000 oil and gas wells have been drilled in the state. Permitting of new drilling, however, did not begin until 1956; and registration of oil and gas operators was not required until 1985. This lack of regulation led to about 100 years of abandonment or improper plugging of many wells. Unplugged old wells can allow leakage of gas into nearby water wells or leakage of salt brine into surface or groundwater.

The Oil and Gas Act of 1984 requires oil and gas well operators to plug nonproducing wells. In 1992 the legislature amended the Oil and Gas Act to allow certain oil and gas wells abandoned before April 1985 to be classified as orphan wells, gave DEP authority to plug orphan wells, and created a means of funding the plugging. Approximately 6,600 abandoned wells have been reported and classified as abandoned.

Salt brines are present in subsurface oil and gas formations and are typically produced as a waste product along with oil and gas. Brines have a potential for contamination by leaching into surface or groundwater. Disposal of brines in an environmentally safe and

economical manner has been a problem. Brine has shown promise for beneficial use as a dust suppressant and road stabilizer on unpaved secondary roads. Strict guidelines have been set by DEP for the use of brines on unpaved roads.

Objectives/Action Items of the Resource Extraction Work Group

Goal 1

Improve and protect water resources as a result of NPS Management Program implementation efforts. Show water resource improvements by measuring reductions in sediments, nutrients, and metals or increases in aquatic life use, riparian habitat, wetlands, or public health benefits. By 2012, through combined program efforts, remove 500 miles of streams and 1,600 lake acres that are identified on Pennsylvania's Integrated List of All Waters as being impaired because of NPSs of pollution.

Objective: Evaluate and categorize or prioritize watersheds with AML for restoration activities.

Action Item: Continue restoration activities on AML including construction of passive treatment systems and land reclamation in watersheds.

Action Item: Encourage restoration activities in watersheds with restoration plans and active watershed associations.

Action Item: Identify streams or watersheds with active watershed associations and who have started restoration efforts. For watersheds without an association, encourage establishment of a watershed association or encourage a county conservation district or municipal authority to lead restoration efforts.

Action Item: Identify streams or watersheds impaired by AMD that are most likely to have potential to achieve water quality standards or that could show a significant progress towards reestablishing a designated use, such as watersheds with few discharges or AMD problem areas or with planned restoration efforts underway and close to completion.

Action Item: Identify streams or watersheds that already have some aquatic macroinvertebrates or fish life and that could reestablish additional species with installation of additional remediation projects.

Objective: If resources allow, restore 100 stream miles to designated uses by improving aquatic habitats to support fish and associated aquatic life in streams impaired by AMD by 2012.

Action Item: Target cleanup of AMD sources in watersheds on the proposed 2008 Integrated List of All Waters that have TMDLs and/or Watershed Restoration Plans developed.

Action Item: Install appropriate Treatment Systems or other Stream Restoration BMPs.

Action Item: If resources allow, reclaim 2,500 acres of AML.

Action Item: Restore losing streams to the surface to reduce surface water infiltration into underground mines and restore aquatic habitat.

Objective: Continue plugging of problem abandoned oil and gas wells to improve water quality, eliminate safety hazards, and eliminate pollution resulting from uncontrolled AMD discharges into ground and surface water from abandoned wells.

Action Item: If resources allow, plug 1,100 of the 6,600 known abandoned oil and gas wells to improve water quality by 2012, eliminate safety hazards, and eliminate pollution resulting from uncontrolled discharges into ground and surface water, contingent on having adequate resources.

Action Item: The Well Plugging Unit of BO&GM should continue coordination of funding for plugging of abandoned and orphaned oil and gas wells.

Goal 2

Coordinate with county conservation districts, watershed groups, local governments, and others in the development and implementation of 34 WIPs meeting EPA's Section 319 criteria to protect and restore surface and groundwater quality.

Objective: Develop 16 integrated WIPs that incorporate AMD/AML Assessments by 2009.

Action Item: Develop WIPs that are comprehensive in scope.

Action Item: Identify watersheds without any plan or a plan without sufficient detail to determine BMP or restoration priorities and rough costs of remediation.

Action Item: If no restoration plan has been completed, provide guidance to groups to prepare a grant proposal to develop a new restoration plan according to EPA/DEP guidelines.

Action Item: Update WIPs on a regular basis to show water quality improvements, problem areas that still need improvement, or where additional restoration efforts are needed. Determine which of these management plans fit criteria for EPA 319 funding.

Action Item: Identify and map locations of watersheds that have WIPs.

Action Item: Develop a map and GIS database of what watersheds already have restoration plans.

Action Item: DEP staff, county conservation district watershed specialists, and WPCAMR or EPCAMR should continue providing guidance on developing, updating, and integrating restoration plans.

Objective: Develop operation, maintenance, and repair plans and funding sources for AMD remediation projects as resources allow.

Action Item: Establish a mechanism for operation, maintenance, and repair of projects to ensure that water quality improvements are maintained.

Action Item: Ensure that someone has responsibility to follow the operation, maintenance, and repair plans.

Action Item: Ensure that operation and maintenance plans are followed so that remediation systems are functioning properly.

Action Item: Evaluate efficiency of constructed passive treatment systems on a regular basis and develop and implement plans to make repairs if necessary.

Action Item: Help local watershed groups or other responsible parties to establish funding sources to implement the operation, maintenance, and repair plans for their treatment systems.

Goal 3

Improve and develop monitoring efforts to determine how projects and programs improve water quality and/or meet target pollution reductions specified in watershed plans or TMDLs.

Objective: Utilize a single, statewide database (clearinghouse) to coordinate the sharing of monitoring and tracking data by 2009.

Action Item: Utilize a data storage and dissemination system similar to Pennsylvania Spatial Data Access (PASDA), Storet or Pennsylvania's Environment, Facility, Application, Compliance Tracking System (eFACTS).

Action Item: Develop a standardized way of collecting data and site descriptions in useable form—standard field and laboratory protocols.

Action Item: Encourage and train watershed groups to use these protocols through a certification program.

Action Item: Develop GIS maps and link as-built designs of locations and types of treatment systems and land reclamation areas.

Action Item: Show water quality effects and other measurable environmental results of passive treatment systems, land reclamation or other restoration efforts using GIS.

Goal 4

Continue to encourage development and use of new technologies, tools, and technology transfer practices to enhance understanding and use of techniques for addressing NPS pollution.

Objective: Encourage development and implementation of new technologies and technology transfer with a goal of more cost effective AMD remediation by 2009.

Action Item: Encourage development of new technologies that will treat the mine pool water in-situ at a cost that is lower than conventional surface treatment.

Action Item: Encourage DEP to finalize plans to use industrial or agricultural by-products to treat mine discharges and land reclamation sites.

Action Item: Encourage use of innovative approaches to economic development to reclaim or reuse abandoned mine sites and mine discharges.

Action Item: Encourage technology transfer through conferences, Web sites, associations, articles, and manuals.

Action Item: DEP should encourage the development of new technologies for the recovery of metals, such as iron, aluminum, magnesium, and strontium, from mine discharges.

Action Item: Encourage development of products using iron sludge from wetlands and settling basins associated with passive treatment systems.

Objective: Improve and encourage education and outreach programs for information dissemination to the general public by 2006.

Action Item: Continue education efforts on the benefits of the safe use of coal ash and other waste byproducts to reclaim AML.

Action Item: Continue to fund educational activities by schools, colleges, and watershed associations to promote and teach children and adults about mine drainage problems and solutions.

Action Item: Hold one AMR conference each year cosponsored by the EPCAMR and the WPCAMR as a means to promote technology transfer among mine reclamation professionals and networking among watershed associations and agencies, consultants, colleges and institutions.

Action Item: Continue to promote the Council for the Research and Reclamation of Disturbed Lands in PA Annual Meeting for the exchange of information about land reclamation.

Action Item: Continue to update and promote the WPCAMR and EPCAMR Web sites and other educational activities as a source of information to everyone involved with mine reclamation.

Action Item: Encourage participation by watershed associations and mine reclamation professionals in conferences and workgroups to discuss new and existing technologies.

Action Item: Encourage sharing of information gathered by Acid Drainage Technology Initiative (ADTI) and other agencies and groups.

Goal 5

Assure implementation of appropriate BMPs to protect, improve, and restore water quality by using or enhancing existing financial incentives, technical assistance, education, and regulatory programs.

Objective: Continue to encourage and promote “Reclaim PA” as a cost-effective means to achieve reclamation of abandoned surface mines.

Action Item: Continue to promote re-mining and reclamation initiatives in the context of a rigorous permitting and enforcement program to assure that current mining and reclamation practices will reduce, not increase, overall AMD.

Action Item: Continue use of Subchapters F and G regulations of the Commonwealth’s coal mining regulations to allow previously mined areas with preexisting discharges to be mined under a revised set of water quality limits that impose no liability to treat the discharge unless the preexisting discharge is degraded as a result of the mining.

Objective: If resources allow, establish a system of long-range planning, technical support, and financial assistance needs for AMD/AML systems and programs for local governments and watershed groups by 2009.

Action Item: Promote a dedicated and secure fund for the implementation, operation, maintenance, and repair such as the establishment of local trust funds and grayfields/brownfields legislation.

Action Item: Use existing DEP and other agency regulatory programs to help achieve this goal.

Objective: Encourage more use of sound science and innovative technology in beneficial uses of biosolids, alkaline coal ash, dredge, and other by-product materials in reclamation by 2009.

Action Item: Use regulations allowing a general permit for the beneficial use of dredged sediment, coal ash, cement kiln dust and lime kiln dust in mine reclamation.

Action Item: Use results of independent studies and reports to show that these materials can be used in a safe manner to benefit the environment and economy of towns with AML.

Action Item: Use biosolids and SMS to improve and maintain productive soils and stimulate plant growth under controlled conditions. Surface applications of biosolids and SMS on mine spoil increase soil moisture and fertility and provide a beneficial alternative to disposal in landfills or incinerators.

Action Item: Use the Pennsylvania Joint Legislative Air and Water Pollution Control and Conservation Committee report on the beneficial use of coal fly ash in mine reclamation projects as an example in promotion of the beneficial use of these products.

Action Item: Continue to require extensive sampling and testing protocols to ensure the safety of the material being used.

Action Item: Continue to require suppliers of dredge material to conduct independent sampling and testing prior to the shipment of each 10,000 cubic yards of the dredged material and test the material again once the dredged material is mixed with the coal ash and kiln dust.

Objective: Promote the new Pennsylvania Energy Harvest Program, funded by a combination of sources including the Clean Air Fund, Growing Greener and U.S. Department of Energy, as a means to use environmental problems as economic opportunities.

Action Item: Promote state-of-the-art coal technologies that will fuel economic development and create new jobs by providing incentives for private investment in depressed areas.

Action Item: Use the Pennsylvania Energy Harvest initiative to provide the financial tools that will encourage clean and renewable energy projects from sources such as biomass, wind, solar, small-scale hydroelectric, landfill methane, coal-bed methane and waste-coal.

Objective: Encourage industry to establish and implement a means for beneficial use of abandoned mine pools and mine discharges by 2009.

Action Item: Inventory available land and water resources to determine where the most likely sites could be located, such as within or close to an urban area for industrial use and a rural area for a water supply.

Action Item: Work with county industrial development authorities and businesses to convince industry to move to the areas of the state where mine pool water is readily available.

Action Item: Encourage DEP, PENNVEST, and DCED to take an active role in investigating incentives to use polluted mine water that would require some level of treatment before the discharge can be used as a water supply.

Action Item: Encourage manufacturing operations to use the billions of gallons of water stored underground in abandoned mine pools throughout the bituminous and anthracite coal fields as a water supply.

Objective: Encourage and implement the redevelopment of AML for recreational, industrial, commercial, and residential uses by 2009.

Action Item: Support the use of financial resources in the proposed grayfields/brownfields legislation as an incentive for reuse of AML.

Action Item: Continue to encourage development such as golf courses, campgrounds, all terrain vehicle/motor cross parks, horseback riding trails, snowmobile trails, and shooting ranges that would take the pressure off use of undeveloped lands for these purposes.

Objective: Continue to encourage the use of coal refuse and waste coal to generate electricity and to refine technology that will convert waste coal to energy, thereby cleaning up refuse piles and reducing surface production of AMD.

Action Item: Encourage coal refuse burning power plants to use waste coal, also known as boney piles, culm, coal refuse, to generate electricity using circulating fluidized bed (CFB) technology.

Action Item: Facilitate use of CFB produced waste in reclamation projects especially those that would benefit from alkaline addition such as strip mine revegetation and soil additives for farms.

Objective: Use existing sources of funding and encourage establishment of new sources of funding for reclamation and mine drainage treatment.

Action Item: Use the following existing funding sources for reclamation and mine drainage treatment projects: resource extraction; Growing Greener; Title IV of the federal SMCRA; bond forfeiture; reclamation-in-lieu of civil penalties; government financed construction contracts; PA DEP 319 NPS Pollution Program; Clean Air Fund; U.S. Department of Energy; and U.S. Office of Surface Mining Appalachian Clean Streams Program.

Action Item: Encourage reauthorization of the federal SMCRA and distribute funds where most needed. Legislation has been proposed to continue the program and accelerate the rate of reclamation for the most dangerous sites. Under proposed legislation, Pennsylvania would receive an initial increase of \$11.4 million annually, raising Pennsylvania's share of cleanup funds from about \$24.1 million yearly to \$35.5 million, nearly a 50% increase.

B. Agriculture

Agriculture is one of Pennsylvania's largest and most productive industries. The NPS impacts of agriculture on the environment are a major concern to Pennsylvania. Recent studies have shown that 39% of all NPS pollution in Pennsylvania comes from agricultural lands. Examples of NPS problems associated with agriculture include erosion and resulting sedimentation of waterways, improper manure and fertilizer management, improper manure storage, and the unintended effects of pesticide use and disposal. Significant local, state, and federal efforts have been made to reduce soil erosion, sedimentation of waterways and other agriculture-related NPS problems. State and federal agriculture and cost-share program funds are being used to reduce NPSs of pollution from agricultural activities.

Agriculture Incentive Programs

Incentive programs such as the Chesapeake Bay Program, the Environmental Quality Incentives Program (EQIP) and the Clean Water Act's Section 319 NPS Management Program, work very well to address NPS problems. BMP implementation plays a large part in incentive programs. Incentive based programs are the desired method to address agricultural NPS issues. There is a strong commitment to continue targeting programs to address agricultural NPS challenges in Pennsylvania.

EQIP

This program was established in the 1996 Farm Bill, the Federal Agriculture Improvement and Reform Act of 1996 (PL 104-127). It is a voluntary conservation program for farmers and ranchers who face serious threats to soil, water, and related natural resources. EQIP provides technical and financial assistance to producers primarily in designated priority areas. The 1996 Farm Bill directed one-half of the assistance be targeted to livestock-related natural resource concerns and the other half to significant conservation priorities. EQIP was reauthorized in the Farm Security and Rural Investment Act of 2002 (Farm Bill) to provide a voluntary conservation program for farmers and ranchers that promote agricultural production and environmental quality as compatible national goals.

Under the 2002 Farm Bill, county conservation districts convene local work groups, identified as a Team, to identify priorities within their specific geographic area. The Team, comprised of representatives from the NRCS, Farm Service Agency, Cooperative Extension, and other local, state, and federal organizations is interested in natural resource concerns. The Team seeks input from the community regarding natural resource concerns and completes a natural resource assessment including wellhead protection areas. Based on the assessment, the Team prioritizes funding proposals within their area and submits these to the NRCS State Conservationist for approval. Pennsylvania's EQIP priorities and scoring mechanism are developed by the State Technical Committee and State Conservationist and are used by each of the local work groups or Teams.

All EQIP activities must be carried out according to a conservation plan. All practices applied must meet NRCS Field Office Technical Guide standards. EQIP funding is offered to producers through 5 to 10-year contracts based on the producer's conservation plan. To learn more about EQIP go to: <http://www.pa.nrcs.usda.gov/programs/>.

CREP

CREP is a voluntary land retirement program that helps agricultural producers and other landowners protect environmentally sensitive land, decrease erosion, restore wildlife habitat, and safeguard ground and surface water. The program is a partnership among producers; tribal, state, and federal governments; and, in some cases, private groups. CREP is an offshoot of the country's largest private-lands environmental improvement program - the Conservation Reserve Program (CRP). Like CRP, CREP is administered by the Farm Service Agency. By combining CRP resources with state, tribal, and private programs, CREP provides agricultural producers and other landowners with a sound financial package for conserving and enhancing natural resources.

Pennsylvania's CREP targets efforts in the Susquehanna, Potomac, and Ohio River watersheds with a goal of 265,000 acres in conservation practices. Since the programs inception in 2000, landowners have signed contracts on over 190,000 acres of land for conservation practices.

For more information about Pennsylvania's CREP, go to <http://www.creppa.org/>.

Chesapeake Bay Program

In 1983 Pennsylvania entered into an agreement with Maryland, Virginia, the District of Columbia, the Chesapeake Bay Commission, and the EPA in the first step toward restoration of the Chesapeake Bay. In 1987 the second Chesapeake Bay Agreement was signed. This agreement established a goal of reducing the controllable nutrient loads measured during 1985 by 40% by the year 2000. The Chesapeake Bay Agreement and the 40% reduction goal were reaffirmed in 1992 and emphasis was placed on achieving the nutrient reductions by establishing reduction goals for each of the Chesapeake Bay's major tributaries.

The major tributaries within Pennsylvania draining into the Chesapeake Bay include the Susquehanna and Potomac Rivers. The Susquehanna River accounts for 93% and the Potomac River for 6% of Pennsylvania's 21,000 square miles of the 67,000 square mile Chesapeake Bay drainage area. Consequently, Pennsylvania's tributaries contribute a significant portion of the nutrient loads being transported to the Chesapeake Bay.

The Financial Assistance Funding Program (Special Projects) provides cost-share funds to landowners to correct nutrient management problems on their farms. Thirty-eight counties participate in the program. The county conservation districts in these counties maintain implementation plans that direct the use of cost-share funds they receive. These plans identify the priority nutrient and sediment reduction needs in their counties and the most effective actions to address them. Most plans focus on agricultural BMPs.

More information about Pennsylvania's Chesapeake Bay Program can be found at: <http://www.depweb.state.pa.us/chesapeake/cwp/view.asp?a=3&Q=442886&chesapeakeNv=|29958|>.

Nutrient Management Program Under Act 38

The Plan Development Incentive Program (PDIP) is a cost-share program designed to assist existing livestock and poultry operations with costs associated in the development of nutrient management plans. This program was developed as an incentive to encourage participation of Concentrated Animal Operations (CAOs) and other agriculture operations in the Nutrient Management Program. An eligible applicant will receive a "one-time" cost-share payment up to 75% of actual costs of plan development.

The Nutrient Management Grant program is a cost-share based grant program designed to provide assistance to Pennsylvania farmers with state-approved nutrient management plans who need to implement plan-identified BMPs. The Nutrient Management Grant

program can provide up to 80% of the cost of implementing a BMP not to exceed \$75,000 per plan.

The Agriculture-Linked Investment Program (Agri-Link) is a low-interest loan program to help farmers protect the environment and improve their operations.

To learn more about the Nutrient Management Program under Act 38 go to:
<http://panutrientmgmt.cas.psu.edu/>.

Integrated Pest Management Program

The Pennsylvania Department of Agriculture (PDA) and the Pennsylvania State University (PSU) cooperate to promote Integrated Pest Management (IPM) in the state. The mission of the IPM program is to promote effective pest management that results in the efficient protection of food, fiber, health, home, and industrial resources in a manner that is profitable, safe, environmentally compatible, and sustainable. This is accomplished by supporting research to develop and/or improve IPM programs through public education of IPM practitioners and implementation of IPM programs.

The IPM program is working to change attitudes about the use of pesticides in Pennsylvania. IPM by definition uses genetic, biologic, cultural, mechanical, and chemical tactics in some combination to manage pest problems in a safe, economical, mechanical, and environmentally friendly manner. In this context, pesticides are now an IPM “team player” instead of being “the star and only game in town!” Pesticide use is now being promoted under the IPM umbrella. In consultation with Pennsylvania’s IPM program, PDA and NRCS have adopted this approach to pest management in recently released BMP standards.

To learn more about Pennsylvania’s IPM program go to:
<http://www.agriculture.state.pa.us/agriculture/cwp/view.asp?q=128306>.

Pennsylvania’s Clean Streams Law

Pennsylvania’s Clean Streams Law, originally passed in 1937, is intended 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...” Many of Pennsylvania’s environmental regulations impacting water quality originate under this statute. Title 25 of the Pennsylvania Code covers many water resource issues including: National Pollutant Discharge Elimination System (NPDES) permitting, water quality standards, erosion control, dam safety, waterway management, and stormwater management.

Pennsylvania’s Clean Streams Law is available in Environmental Laws of PA folder at:
<http://www.depweb.state.pa.us>, “Quick Access” Forms & Publications.

Concentrated Animal Feeding Operation (CAFO) Program

DEP has a regulatory program for working with CAFOs. CAFOs in Pennsylvania are defined as operations with more than 1,000 animal equivalent units, operations with

301 to 1,000 animal equivalent units that are CAOs under our state Nutrient Management Program or operations over the EPA animal thresholds for large CAFOs. CAFOs are growing in size and number in Pennsylvania. The program integrates tools that are already in place to control excess nutrient runoff, such as the Nutrient Management Program under Act 38 and the Chesapeake Bay Program's experience, with its permitting requirements. It is the intent of the program to ensure that all CAFOs are constructed and managed in an environmentally sound manner while also ensuring agricultural production that is profitable, economically feasible, and based on sound technology and practical production techniques. A regulations update in October of 2005 brought dry poultry operations into the CAFO Program, which doubled the number of farms covered.

To assure uniform compliance with the provisions of the Clean Water Act, Pennsylvania's Clean Streams Law (35 P.S. §§ 691.1-691.1001), and Sections 1905-A, 1917-A and 1920-A of The Administrative Code of 1929 (71 P.S. §§ 510-5, 510-17 and 510-20), DEP developed the document "Implementation Guidance for NPDES CAFO Permits and Water Quality Management Permits for Manure Storage Facilities." The CAFO Program and related administrative and permit documents are available at: <http://www.depweb.state.pa.us>, keyword: CAFOs.

Objectives/Action Items of the Agriculture Work Group

Goal 1

Improve and protect water resources as a result of NPS Management Program implementation efforts. Show water resource improvements by measuring reductions in sediments, nutrients, and metals or increases in aquatic life use, riparian habitat, wetlands, or public health benefits. By 2012, through combined program efforts, remove 500 miles of streams and 1,600 lake acres that are identified on Pennsylvania's Integrated List of All Waters as being impaired because of NPSs of pollution.

Objective: Track agricultural BMP implementation and estimate reductions in sediment and nutrients. Track designated use attainment in watersheds where agriculture is the major source of impairment. Further develop or refine existing Section 319 NPS GRTS database to collect this information on a watershed basis by 2012.

Action Item: Develop a GIS-based system that can collect information from county conservation districts, the Coastal NPS Pollution Program, NRCS, and DEP to track BMP implementation.

Action Item: Further develop or refine existing Section 319 NPS GRTS database to collect this information on a watershed basis by 2012. Continue to develop, improve, and utilize load reduction models such as ArcView Generalized Watershed Loading Function (AVGWLF), Pollution Reduction Impact Comparison Tool (PRedICT) and STEPL.

Action Item: Provide training on use of load reduction models and for database use, and begin implementation.

Action Item: Prioritize agriculture-impaired watersheds using DEP Instream Comprehensive Evaluation (ICE) protocol data for helping to meet designated uses in agriculturally-impaired watersheds.

Goal 2

Coordinate with county conservation districts, watershed groups, local governments, and others in the development and implementation of 34 WIPs meeting EPA's Section 319 criteria to protect and restore surface and groundwater quality.

Objective: Increase local agricultural producers' involvement in watershed planning and implementation efforts by 2012.

Action Item: By 2008, all watershed planning groups addressing agricultural lands will have at least one local agricultural producer.

Action Item: Improve existing tools for watershed planning and implementation to ensure they include education and outreach components for agricultural producers.

Action Item: Promote to the agricultural community and watershed organizations the importance of local agricultural producers being involved in watershed planning efforts.

Goal 3

Improve and develop monitoring efforts to determine how projects and programs improve water quality and/or meet target pollution reductions including TMDLs.

Objective: Increase accessibility of local, state, and regional water quality data to decision makers, watershed organizations, and producers to target water quality restoration and protection efforts.

Action Item: Provide access to DEP water quality data to local groups.

Action Item: Establish or improve electronic access to water quality data use by linking and consolidating existing water quality data.

Objective: Establish local water-quality monitoring sites to both obtain baseline water quality data and assess the effectiveness of agricultural BMPs.

Action Item: Target sites to small watersheds where concentrated implementation efforts are being made.

Action Item: Utilize water quality monitoring data to document water quality improvements where sediment, nutrients, and other agriculture-related impairments have been documented.

Action Item: Use local monitoring data to assist in evaluating agriculture-impaired waterbodies and help determine whether these waterbodies can be removed from Pennsylvania's Integrated List of All Waters.

Action Item: Continue to support sediment and nutrient monitoring and trends analysis through the ICE protocol to measure progress in meeting Pennsylvania's Chesapeake Bay Tributary Strategy goals.

Goal 4

Encourage development and use of new technologies, tools, and technology transfer practices to enhance understanding and use of techniques for addressing NPS pollution.

Objective: Assess the feasibility and effectiveness of Pennsylvania's nutrient reduction credit trading program using actual projects underway or completed, such as the Conestoga River Watershed Pilot Project, by 2008.

Action Item: Encourage the development of a report describing the success or failure of the program and possible next steps.

Objective: Increase the adoption of cost-effective BMPs to minimize ammonia emissions and protect/improve air quality on 1,000 farms by 2012.

Action Item: Identify the most cost-effective BMPs, develop practical and effective standards, help producers implement those BMPs, and provide educational outreach to producers.

Objective: Facilitate four projects demonstrating market-based opportunities to address agricultural water quality issues by 2008.

Action Item: Utilize Growing Greener Program, Energy Harvest grants, and other existing sources of financial assistance to complete these projects.

Objective: Demonstrate the implementation of technologies and management systems (conservation tillage, composting, etc.) identified to be environmentally sound and economically feasible.

Action Item: Identify new and update existing practice standards, utilize existing funding for implementation, and focus on technical assistance.

Objective: Assess the feasibility of new technology and BMPs to address the nutrient imbalance on agricultural lands.

Action Item: Evaluate and support implementation of new technologies.

Goal 5

Assure implementation of appropriate BMPs to protect, improve, and restore water quality by using or enhancing existing financial incentives, technical assistance, education, and regulatory programs.

Objective: Increase farmer participation in the PEACCE program by 2012.

Action Item: Continue existing training and support for the PEACCE program.

Action Item: Pursue farm assessment support and development.

Objective: Maintain and increase nutrient management, soil conservation, and agronomic management educational efforts to producers, program and technical support staff, and agribusiness by 2012.

Action Item: Focus implementation resources to areas of need.

Action Item: Promote education and outreach efforts.

Objective: Track nutrient management plan implementation on CAOs and CAFOs where required by state/federal mandate.

Action Item: Assure that nutrient management planning and nutrient management plan implementation are taking place.

Action Item: Complete DEP CAFO permitting program implementation.

Objective: Fully implement Pennsylvania's CREP in the Susquehanna and Ohio River Basins and investigate the possible future expansion of CREP to include the Delaware River Basin.

Action Item: Continue U.S. Department of Agriculture (USDA) and state funding to implement existing CREP in Pennsylvania.

Objective: Develop and fully implement a Manure Hauler and Broker Certification program.

Action Item: Develop program criteria including training for manure hauler and broker certification.

Action Item: Achieve full participation in the industry in continuing education training and certification.

Action Item: Provide a continuing statewide education and certification program.

Objective: Increase accessibility to agriculture research data and information on the agriculture-related water and air pollutant mechanisms through workshops, print media, and the internet by 2012.

Action Item: Develop and include links to existing Web sites.

Action Item: Include agricultural air and water research information in information materials.

Objective: Facilitate conservation planning and implementation efforts and track conservation planning and implementation to help producers comply with NRCS and county conservation district requirements by 2012.

Action Item: Increase conservation planning in agricultural-impaired watersheds so that 75% of farms are under conservation planning.

Action Item: Target existing technical and financial resources and training to successfully implement this effort.

Action Item: Streamline county conservation district and NRCS tracking efforts so that county and statewide data is easily obtainable upon request.

Objective: Develop and implement MFEMPs on sites utilizing mushroom substrate and SMS by 2012.

Action Item: Focus existing funding to support MFEMP development and implementation.

Objective: Complete four projects that implement alternative use technologies for SMS by 2008.

C. Construction/Urban Runoff

This NPS pollution category encompasses two major subcategories, highway redevelopment construction and new land development, that includes residential, industrial, commercial, institutional, and recreational construction. Uncontrolled runoff from these construction sites can cause significant soil erosion and localized sediment pollution in streams and other water bodies.

Pennsylvania's Erosion and Sediment Pollution Control (E&SPC) Program

The E&SPC Program is administered by DEP and county conservation districts coordinated through a delegation of DEP's authorities to county conservation districts. Joint responsibilities for program implementation include the processing and issuance of permits, complaint investigations, site inspections, compliance, and enforcement. Erosion and sediment (E&S) control plans incorporate BMPs that are reviewed for design and performance effectiveness through permit plan reviews and periodic site inspections at the construction site.

Standards and criteria for minimizing erosion and preventing sediment pollution are contained within DEP's Chapter 102 rules and regulations as authorized under Pennsylvania's Clean Streams Law. These regulations apply to any earth disturbance activity including activities related to agricultural plowing and tilling, timber harvesting, land development; road, highway and bridge construction, and road maintenance. Chapter 102 requires that an E&S plan be developed and implemented for earth disturbance activities. Each E&S plan must specify the BMPs that will be used to minimize erosion and prevent sediment pollution from the earth disturbance activity. The

NPDES permit program for stormwater discharges associated with construction activities integrates the Commonwealth's Chapter 102 regulatory requirements.

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

Dirt and Gravel Road Initiative

Pennsylvania's Dirt and Gravel Road Maintenance Program provides grant funding to eliminate stream pollution caused by dust and sediment from unpaved roads. The program and its annual \$5 million apportionment for "environmentally sound maintenance" were enacted into law in April 1997, as Section 9106—Pennsylvania Vehicle Code. Each year, the State Conservation Commission allocates this "dedicated funding", based on identified need, to county conservation districts. Townships and other public road-owning entities, after successful completion of required two-day "Environmentally Sensitive Maintenance" training, apply to local county conservation districts for these maintenance funds to address identified pollution problems using environmentally sound road maintenance practices.

For more information on the Dirt and Gravel Road Maintenance Program refer to the Web sites: <http://www.agriculture.state.pa.us/agriculture/cwp/view.asp?a=3&q=129657> or <http://www.dirtandgravelroads.org/>.

The Stormwater Management Act (Act 167 of 1978)

Pennsylvania's stormwater management program is authorized by the Stormwater Management Act, 32 P.S. 680.1 *et seq.* (Act 167). Act 167 requires counties to prepare watershed stormwater management plans for more than 370 designated watersheds covering all of Pennsylvania. These stormwater management plans establish watershed-specific measures to preserve and restore flood carrying capacity of streams; to preserve natural stormwater runoff regimes and natural course, current, and cross section of waters of the Commonwealth; and to protect and conserve groundwaters and groundwater recharge areas. Act 167 encourages planning and management of stormwater runoff in each watershed consistent with sound water and land use practices together with local administration and management of stormwater consistent with preservation of natural, economic, scenic, aesthetic, recreational, and historic values of the environment.

Storm water management plans developed under Act 167 provide standards and criteria to manage stormwater runoff to preserve and protect stream quality and water quality; to minimize the volume of stormwater runoff by encouraging infiltration into the ground; to protect downstream areas from flood damage by controlling postdevelopment peak flow rates to predevelopment levels, by encouraging detention to provide filtration and pollutant removal, and by encouraging use of development methods that minimize environmental impacts.

Development of stormwater management plans under Act 167 includes the participation of a watershed plan advisory committee consisting of representatives from each municipality, the county conservation district, and other agencies and groups as appropriate for the effort. These plans are implemented primarily by enactment of ordinances by the local municipalities in the watershed; however, after adoption by the county and approval by DEP, projects funded by the Commonwealth must be consistent with the plan plus anyone engaged in the development of land is required to implement measures consistent with the plan. By enacting ordinances, local municipalities become authorized to issue permits, enforce the provisions of the stormwater management plan, collect fees to cover costs of permitting and enforcement activities, and receive reimbursements for allowable costs under Act 167.

NPDES Permits

To further advance effective stormwater management and to support DEP's water quality protection program requirements, applications for an NPDES Permit for Stormwater Discharges Associated With Construction Activities must include a postconstruction stormwater management plan describing BMPs that will be implemented during the construction activity and then maintained after construction has been completed.

DEP has issued a general permit (NPDES Stormwater Discharges From Municipal Separate Storm Sewer Systems (MS4s) General Permit, PAG-13) that can be used by operators of MS4s not located in High Quality (HQ) or Exceptional Value (EV) watersheds. Permit applications or Notice of Intents to be covered under the general permit were due by March 10, 2003. Each permittee must, within the term of the first 5-year permit, implement and enforce a stormwater management program designed to reduce the discharge of pollutants to the maximum extent practicable with the goal of protecting water quality and satisfying water quality requirements of state and federal law. The program must contain a schedule of activities, a list of BMPs, and a set of measurable goals for each of six Minimum Control Measures (MCMs) defined in the NPDES Phase II Rule. DEP has developed a *Protocol* that recommends an approved approach to complying with each of the six MCMs. MS4s choosing to follow the *Protocol* do not need specific approval from DEP for their program. The six MCMs are listed below:

1. Public outreach and education
2. Public participation and involvement
3. Illicit discharge detection and elimination
4. Construction site runoff control
5. Postconstruction stormwater management in new development and redevelopment
6. Pollution prevention and good housekeeping for municipal operations and maintenance

Pennsylvania Stormwater Best Management Practices Manual (BMP Manual)

DEP, with the help of a consultant and an expert oversight committee, has developed a new stormwater BMP Manual that is tailored specifically to Pennsylvania's needs and features. The manual provides design standards and planning concepts to guide DEP, county conservation districts, local authorities, planners, land developers, contractors, and others involved with planning, designing, reviewing, approving, and constructing land development projects. The BMP Manual emphasizes technical solutions that will lead to better water quality and quantity management for new land development and redevelopment. Focus is placed on an integrated management approach that addresses stormwater events ranging from showers to floods and includes rate control, volume control, and water quality enhancement. The BMP Manual became effective on December 30, 2006.

Research and directed studies emphasize comprehensive watershed stormwater management planning, implementation, and evaluation. Primary research needs include the design, longevity, maintenance, and benefits of BMPs. Currently the directed studies involve investigating infiltration as a stormwater design focus for the Commonwealth to support the recent emphasis on volume control and water quality protection. This shifting from traditional detention-based stormwater management designs intended to reduce flood peaks to designs and practices that also address channel changes and degradation, runoff quality, protection of base flow, and aquifer recharge requires a fundamental change in how water resource professionals do business. Seeking to create a long-term research effort to support this change in design philosophy and to bring together government, industry, and academia, DEP and Villanova University co-founded the Villanova Urban Stormwater Partnership (VUSP) in July 2002. VUSP membership is open to industry, consultants, and others interested in hastening the development of innovative stormwater management practices. The mission of VUSP is to advance the evolving comprehensive stormwater management field and to foster public and private partnerships through research on innovative BMPs, directed studies, technology transfer and education.

For more information, refer to the Web site:

<http://www.depweb.state.pa.us/watershedmgmt/cwp/view.asp?a=1437&q=518682>.

The Pennsylvania Handbook of BMPs for Developing Areas

This handbook is intended to be a site planning and BMP selection guide for local authorities, planners, contractors, and others involved with planning, designing, reviewing, approving, and building development projects. The handbook targets accelerated soil erosion and sedimentation and management of stormwater runoff, because these are the primary issues covered by local, state, and federal regulations that apply to development projects. Related issues such as water quality protection, watershed management, and wildlife habitat are covered as a secondary consideration to the extent that many of the planning principles and practices that are recommended for erosion control or stormwater management also may provide benefits in this areas. As the field of watershed management continues to evolve, the handbook will change to reflect improvements in our understanding of the design and use of BMPs. The handbook is viewable at: www.pacd.org/products/bmp/bmp_handbook.htm.

Objectives/Action Items of the Urban/Stormwater Work Group

Goal 1

Improve and protect water resources as a result of NPS Management Program implementation efforts. Show water resource improvements by measuring reductions in sediments, nutrients, and metals or increases in aquatic life use, riparian habitat, wetlands, or public health benefits. By 2012, through combined program efforts, remove 500 miles of streams and 1,600 lake acres that are identified on Pennsylvania's Integrated List of All Waters as being impaired because of NPSs of pollution.

Objective: Reduce stormwater impairments that are caused by construction, dirt and gravel roads, and urban runoff by 2009.

Action Item: Require municipalities to implement Act 167 plan requirements.

Action Item: Continue to encourage the implementation of stormwater ordinances that address water quality for all municipalities.

Action Item: Include water quality considerations in all Act 167 plans or MS4 requirements.

Action Item: Encourage long-term maintenance of postconstruction stormwater management BMPs as specified in BMP Manual.

Action Item: Through existing permit programs require local, state, and federal agencies to incorporate water quality standards and practices into their planning, design, construction, and maintenance procedures through the regulatory process.

Goal 2

Coordinate with county conservation districts, watershed groups, local governments, and others in the development and implementation of 34 WIPs meeting EPA's Section 319 criteria to protect and restore surface and groundwater quality.

Objective: Involve municipal officials, county planning officials, county conservation district, local stakeholders, watershed groups, and other local advocate groups by 2009.

Action Item: Establish priority areas to target outreach efforts using TMDLs and designated/existing stream uses.

Action Item: Develop and implement a tiered delivery system for local stakeholders, interest groups, and other local environmental advocates.

Action Item: Continue to expand the education and training of target stakeholders, such as developers, designers, solicitors, engineers, municipal officials, etc., on implementation of sound stormwater management methods.

Action Item: Establish a mechanism to coordinate outreach efforts. Promote adoption and implementation by municipalities of model ordinances that promote water quality protection.

Action Item: Encourage planning and implementation of zoning strategies that are compatible with environmentally sensitive areas and include low impact development techniques.

Action Item: As resources allow, replicate successful outreach efforts, i.e., “Builders for the Bay,” in other watersheds.

Objective: Past and present planning efforts by federal and state transportation agencies have concentrated primarily on addressing interstate road standards. Identify practical applications of good design criteria, construction, and/or maintenance standards that can be adopted by local governments by 2009.

Action Item: Update/revise Pennsylvania Department of Transportation’s (PennDOT) guide to local roads handbook.

Action Item: Coordinate with the Federal Highways Administration to update and revise their low volume road standards.

Action Item: Continue to pursue opportunities to promote and implement demonstration projects that utilize good design, construction, and maintenance techniques.

Goal 3

Improve and develop monitoring efforts to determine how projects and programs improve water quality and/or meet target pollution reductions including TMDLs.

Objective: Track and report on existing regulatory and nonregulatory program requirements and the potential effect they have on protecting and maintaining water quality on an annual basis.

Action Item: Provide report(s) on program activities, which identify effective BMPs that reduce pollutant levels from urban development and dirt and gravel road maintenance activities.

Action Item: Develop, update, and revise program guidance documents and reference manuals to reflect regulatory or nonregulatory changes.

Action Item: Encourage flexibility and new technology for demonstration sites. Require the use of performance-based criteria for BMPs.

Goal 4

Encourage development and use of new technologies, tools, and technology transfer practices to enhance understanding and use of techniques for addressing NPS pollution.

Objective: As resources allow, continue support of VUSP and other educational institutions as a resource center to identify and research appropriate BMPs.

Action Item: Implement new approaches and technologies in Act 167 stormwater management plans as appropriate.

Action Item: Identify success stories and failures/lessons learned regarding structural and nonstructural BMPs.

Action Item: Establish Web links to research sites such as VUSP, PSU, EPA, and the Center for Watershed Protection.

Action Item: Promote the use of green engineering, low impact development, environmentally sensitive site design, and zoning that is compatible with low impact development techniques.

Action Item: Update as appropriate the BMP Manual.

Action Item: As resources allow, promote pilot projects that focus on protecting surface and ground water quality.

Goal 5

Assure implementation of appropriate BMPs to protect, improve, and restore water quality by using or enhancing existing financial incentives, technical assistance, education, and regulatory programs.

Objective: Continue to support long-range planning, technical assistance, financial assistance, and compliance for stormwater management systems and programs for local governments as resources allow.

Action Item: Encourage the use of PENNVEST funding for municipal stormwater projects to assist municipalities to meet NPDES stormwater permit requirements.

Action Item: As resources allow, increase technical and financial assistance to counties and local municipalities for development and implementation of Act 167 stormwater management plans.

Action Item: Provide outreach and training on the BMP Manual including related hydrologic and infiltration processes to DEP, county conservation district staff, municipalities, and consultants by the end of 2007.

Action Item: Publicize, distribute, and provide training for the use of innovative measures that integrate runoff planning and design for construction and permanent stormwater management.

Action Item: Continue and enhance yearly technical training sessions and conduct program evaluations to ensure consistent, technically sound program administration by county conservation districts and DEP regional offices.

D. Hydrologic/Habitat Modification

Indirect changes in hydrology that result in nonpoint pollution include: changing land uses, increasing impervious surface areas, lack of stormwater management, lack of floodplain management, unlimited livestock access to streams, 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.

WATERWAYS AND WETLAND PROTECTION

DEP's jurisdiction for protecting watercourses, floodways, and bodies of water (including lakes and wetlands), is primarily established by the Dam Safety and Encroachments Act of 1978. New amended regulations became effective October 12, 1991. Since March 1, 1995, DEP has been given authority to issue federal Section 404 authorization along with state permit approvals for most projects through the Pennsylvania State Programmatic General Permit (PASPGP-2). This provides "one-stop shopping" for approximately 85% of the state and federal permit applications received. The remaining 15% of the Chapter 105/Section 10 or 404 permit applications are individually reviewed by both DEP and the U.S. Army Corps of Engineers (USACOE). Permitting and enforcement are housed within the Permitting and Technical Services Section in the DEP Regional Offices. Program development and coordination is provided by the Division of Waterways, Wetlands and Stormwater Management in the Bureau of Watershed Management. All permit applications are reviewed for impacts to the environment, as well as effects on public health and safety. Special protection is provided for EV Wetlands. Mitigation for wetland impacts is required for permitted activities.

Thirty (30) of Pennsylvania's 66 county conservation districts have Chapter 105 Delegation Agreements with DEP. The basic duties of each district are to: 1) provide information and written materials to the general public on the Dam Safety and Encroachments Act and Chapter 105 regulations, 2) register general permits, and 3) perform on-site investigations as the first step to gain voluntary compliance.

DEP WETLANDS INITIATIVES

Since 1990, 6,052.9 acres of wetlands have been created or restored through permitting programs and private land initiatives, more than offsetting the 1,014.2 acres of permitted losses under the state program during the same timeframe. These initiatives include:

- Pennsylvania Wetland Replacement Project (PWRP)

- Wetland Restoration/Creation Site Registry
- PennDOT Wetland Bank

For more information, refer to Web site:

<http://www.dep.state.pa.us/dep/deputate/watermgmt/wc/Subjects/WWEC/GENERAL/WETLANDS/wetlands.htm>.

PWRP

DEP, in cooperation with the National Fish and Wildlife Foundation, has established the PWRP, a fund to assist permit applicants in meeting the wetland replacement requirements in the Chapter 105 regulations. The fund minimizes the regulatory burden on the permit applicants while providing an avenue for viable and productive wetland restoration projects.

Wetland Restoration/Creation Site Registry

The wetland registry's purpose is to link property owners who desire to have wetlands created or restored on their property with individuals who are required to replace wetlands as a result of permitting actions authorized by DEP. Environmental organizations or other such groups are also encouraged to use the wetland registry when looking for wetland restoration project sites.

PennDOT Wetland Bank

In the mid 1990s, PennDOT Engineering District 9 approached DEP and other resource agencies about creating a wetland mitigation bank to offset wetland impacts associated with transportation infrastructure construction and improvements. Those early discussions lead to the construction of several wetland mitigation banks within the PennDOT District 9 over the next five years. Based on the early successes of those projects, in June 2002 PennDOT and the regulatory agencies approved a statewide Wetland Mitigation Banking Agreement for use throughout the Commonwealth. These agreements outline the relationship, duties, and responsibilities for each of the various resource and permitting agencies. The District 9 agreement was used as a template for the statewide agreement and the individual agreements used by Districts 2 and 3. All PennDOT districts are now using the new statewide agreement for the development of mitigation banks. The mitigation banks are designated to capture the small impacts associated with small infrastructure improvements and maintenance activities.

THE KEYSTONE STREAM TEAM

The Keystone Stream Team (KST) was founded in 1999 for the purpose of advancing NSCD technology in Pennsylvania. Through its diversified membership, consisting of watershed groups, technical consultants, and state and federal agencies, KST has formulated general guidelines for applying this new technology with the goal of returning Pennsylvania streams and watersheds to a natural, self-sustaining state.

NSCD is a new technology that continues to evolve. The KST constantly assesses this technology through its committees and workgroups and conveys updated information through NSCD summits and the KST Web site. The KST offers its knowledge and expertise to anyone involved in stream and watershed restoration in the Commonwealth of Pennsylvania. For more information, refer to the KST Web site: www.keystonestreamteam.org.

PENNSYLVANIA'S STREAM RELEAF

In May 1997, then Governor Tom Ridge launched a multi-agency initiative to restore and conserve streamside forest buffers in Pennsylvania. This initiative paved the way for improved water quality and habitat by restoring native vegetation next to streams. These restored areas filter surface runoff and protect streams from pollutants. Wildlife habitat benefits are derived as well.

Through Stream ReLeaf, Pennsylvania is participating with Maryland and Virginia to restore 10,000 miles of forested streamside buffers along the Chesapeake Bay's shorelines and tributaries by the year 2010. Pennsylvania has committed to restoring 3,330 miles of the 10,000-mile goal.

In October of 2004 DEP unveiled the Pennsylvania Stream ReLeaf Database. This database consolidates information about riparian forest buffers throughout the Commonwealth. The database tracks historical information about individual buffer projects, accepts information on new buffer projects, and provides a means for interested parties to query the database.

Information on buffer projects can be submitted in writing on a Project Data Sheet or electronically. The data sheet or electronic submission is available at www.depweb.state.pa.us, keyword: Stream ReLeaf.

DEP has published and distributed Pennsylvania Stream ReLeaf – A Plan for Restoring and Conserving Buffers Along Pennsylvania Streams. Pennsylvania's NPS Management Program provided grant funds to the Alliance for the Chesapeake Bay to develop the Forest Buffer Toolkit, a "how to" manual aimed at local citizen's groups and municipalities.

FLOODPLAIN MANAGEMENT

Under the Floodplain Management Act of 1978, Act 166, regulation of the use of floodplain lands is a responsibility of state and local governments. Flood prone communities in the National Flood Insurance Program (NFIP) are required to adopt and enforce such floodplain regulations to qualify for the sale of federally-backed insurance to its residents. Areas that are prone to flooding and 100-year flood levels are shown on Flood Insurance Rate Maps (FIRMs). Flood prone municipalities are required by Act 166 to participate in the NFIP.

DCED administers the Act 166 reimbursement program and provides technical assistance in floodplain management to local municipalities. The agency provides financial assistance to help municipalities defray their administrative and enforcement costs

associated with local floodplain management regulations. DCED also receives \$60,000 per year from the Federal Emergency Management Agency (FEMA). These funds are being used to develop local capacity in the floodplain management regulations and implementation. DCED is in the process of contracting with 11 county conservation districts to carry on the program. These are all districts that have experience with the program. The districts visit each municipality to review the floodplain management regulations and the local ordinances and discuss how they are being implemented within the municipality. Additional funding is needed to expand the program to all counties. Link to DCED's floodplain management suggested provisions: <http://www.newpa.com/default.aspx?id=140>. Link to FEMA floodplain management requirements: <http://www.fema.gov/plan/prevent/floodplain/index.shtm>.

Watershed Protection and Flood Prevention Program (PL 83-566)

This program authorizes the USDA Secretary of Agriculture to conduct investigations and surveys of water and related land resources in cooperation with other agencies and to provide technical and financial assistance to local organizations for planning and carrying out watershed projects. The program is versatile and has its strength in taking a comprehensive approach to solving water resource problems such as flood control, floodplain management including urban runoff, agricultural NPS challenges, and AMD problems. Projects are developed on a watershed basis. The program emphasizes planning through interdisciplinary teams that include the sponsors, other agencies, and private organizations. For more information, refer to Web site: <http://wmc.ar.nrcs.usda.gov/technical/WS/plancriteria.html>.

Association of State Floodplain Managers (ASFPM)

The ASFPM is a good source of information for many government floodplain management programs. The Mitigation Committee, for instance, focuses on post disaster activities, including programs that can provide funding help to property owners. The Floodproofing/Retrofitting Committee has been very helpful in coordinating and publicizing federal, state, and local flood proofing activities. The Maps and Mapping Committee is active in pursuing new mapping techniques and GIS. The association is primarily an organization that represents state agencies who are the lead agencies for their respective states' floodplain management programs. These agencies also usually serve as the state coordinator agency for the NFIP. For more information, refer to Web site: www.floods.org.

Floodplain Management Resource Center

The ASFPM has established the Floodplain Management Resource Center in Boulder, Colorado, as a public service. The Center houses a large number of documents, as well as the nation's largest collection of documents on retrofitting. Assistance is provided in securing documents, copies of those out of print, or summaries of documents.

Municipalities, watershed associations, and county conservation districts are key organizations in managing NPS challenges in hydromodification activities at the grassroots level. For more information, refer to Web site: www.floodplain.org.

Objectives/Action Items of the Hydromodification Work Group

Goal 1

Improve and protect water resources as a result of NPS Management Program implementation efforts. Show water resource improvements by measuring reductions in sediments, nutrients, and metals or increases in aquatic life use, riparian habitat, wetlands, or public health benefits. By 2012, through combined program efforts, remove 500 miles of streams and 1,600 lake acres that are identified on Pennsylvania's Integrated List of All Waters as being impaired because of NPSs of pollution.

Objective: Modify or remove dams and implement NSCD measures when applicable.

Action Item: Increase from seven to ten the number of fish passage annual modifications or dam removals by the end of 2009.

Objective: Where new and existing flood protection projects are necessary, promote NSCD measures to minimize ecological impacts.

Action Item: Design and construct one flood protection project utilizing NSCD measures to minimize ecological impacts by the end of 2009.

Objective: Promote remediation on waterways that are impacted by sediment.

Goal 2

Coordinate with county conservation districts, watershed groups, local governments, and others in the development and implementation of 34 WIPs meeting EPA's Section 319 criteria to protect and restore surface and groundwater quality.

Objective: Encourage all watershed groups and others interested in doing stream channel restoration to do a holistic physical assessment that leads to restoration plans that allow for prioritization of projects and appropriate technical solutions.

Objective: Establish a mechanism for operation, maintenance, and repair of projects to ensure that water quality improvements are maintained.

Objective: Continue to update the *Guidelines for Natural Stream Channel Design for Pennsylvania Waterways*.

Goal 3

Improve and develop monitoring efforts to determine how projects and programs improve water quality and/or meet target pollution reductions including TMDLs.

Objective: Evaluate, quantify, and document aquatic habitat loss resulting from surface water and groundwater withdrawals.

Action Item: Continue to implement the Basin Instream Flow Studies for major river basins throughout the Commonwealth as funding and personnel constraints allow.

Goal 4

Encourage development and use of new technologies, tools, and technology transfer practices to enhance understanding and use of techniques for addressing NPS pollution.

Objective: Promote the KST as the mechanism to facilitate the transfer of information on NSCD.

Objective: Promote an understanding of available BMPs for channel restoration and where they are appropriate.

Action Item: Promote the use of fluvial geomorphology in evaluating and restoring streams when appropriate (i.e., the stream channel is unstable).

Action Item: Promote the use of soil-bioengineering and other techniques to lessen the negative impacts of hard techniques that may be needed to protect infrastructure including innovative technologies directed at channel restoration/stability by supporting the annual stream summit and training of conservation partners annually as funding and personnel allow.

Objective: As resources allow, continue definition of regional characteristics related to sediment transport, regional curves, reference reaches, etc.

Goal 5

Assure implementation of appropriate BMPs to protect, improve, and restore water quality by using or enhancing existing financial incentives, technical assistance, education, and regulatory programs.

Objective: Promote a general understanding of channel maintenance and its impact on channel function.

Action Item: Develop a fact sheet on dredging and stream corridor management.

Objective: Increase the number of municipalities effectively implementing floodplain and stormwater management measures.

Action Item: Update municipal Floodplain Management Ordinances to comply with current FEMA regulations.

Action Item: Enforce adopted Act 167 plan requirements to manage stormwater and maintain stream channel stabilization.

Action Item: Have adequate funding levels to continue the county conservation district “community-assisted visits and contacts” to municipalities.

Action Item: Increase outreach efforts in the Floodplain Management Program to continually retrain since there is a perpetual turnover of municipal officials.

E. Lakes

Section 314 of the Clean Water Act focuses on lakes. Clean Lakes initiatives are now funded through Section 319. Public and nonpublic lake initiatives are also funded through Pennsylvania’s Growing Greener Program. Pennsylvania has approximately 1,500 lakes and reservoirs that total about 161,000 water acres. The State Park System includes 150 lakes and ponds located in 72 different parks and includes a total of 33,460 water acres. Boating, swimming, fishing, and other recreational activities are often a part of a lake community. Pennsylvania’s lake management regulation is codified in the DEP’s Rules and Regulations at Section 95.6 - Discharges to Lakes, Ponds, and Impoundments, which sets forth treatment requirements for point source discharges necessary to control eutrophication. The Department of Conservation and Natural Resources (DCNR) has also developed a Lake Management Plan for state park lakes that identifies individual lake needs. These individual problems have often been excluded from the overall maintenance and planning concerns of the parks. The challenge in lake management is to involve the people in the watershed in preventing NPS pollution and restoring riparian habitat, as well as to identify and permit in-lake practices that can mitigate lake problems while the watershed is being restored.

Restoration Efforts

The Commonwealth’s Lake Protection and Restoration Program is supported mainly by EPA’s NPS Management Program, Section 319 of the Clean Water Act. Program goals to restore and/or protect lake water quality are based on studies that identify impairments, pollution sources, and recommendations for remediation. Public uses and lake benefits and watershed priority based on impairment are important criteria in prioritizing lakes to be funded for studies and/or restoration. Impairment screening is done to determine the Trophic State Index (TSI), aquatic life, human health and recreational uses, and the need for more in-depth (EPA Clean Lakes Phase I type) studies. Phase I assessment/feasibility studies evaluate existing water quality conditions, identify sources and magnitude of pollutants, identify water quality violations, and determine impacts on uses. Phase I evaluations also include a review of feasible control and restoration methods and recommend lake and watershed management strategies to restore or protect water quality. Phase II projects continue documentation of water quality conditions and implement BMPs, as recommended in the Phase I management plan. Many of our original Clean Lakes Phase I projects completed in the 1990s are implementing recommended BMPs. Three are well on their way to meeting their TMDL, and two (Stephen Foster Lake, Bradford County and Harveys Lake, Luzerne County) have been selected as EPA “Success Stories.” State Parks Lake Management is geared to improve recreational opportunities, as well as to conserve lake resources for future park users.

Objectives/Action Items of the Lakes Work Group

Goal 1

Improve and protect water resources as a result of NPS Management Program implementation efforts. Show water resource improvements by measuring reductions in sediments, nutrients, and metals or increases in aquatic life use, riparian habitat, wetlands, or public health benefits. By 2012, through combined program efforts, remove 500 miles of streams and 1,600 lake acres that are identified on Pennsylvania's Integrated List of All Waters as being impaired because of NPSs of pollution.

Objective: By 2012, develop comprehensive Pennsylvania Lake Classification and Lake Criteria System and remove from the Pennsylvania's Integrated List of All Waters those lakes that have good water quality and meet designated lake uses but violated stream-based criteria of dissolved oxygen and temperature.

Action Item: In order to properly judge a lake's attainment of uses, improvements to the State's Water Quality Criteria (Chapter 93) use designation definitions for lakes, and the classification, need to be developed:

- Review present classifications of lakes
- Review lake classification and water quality standards in other states, and review their process of determining impairments.
- Develop a documented review that can be referenced and built upon for the proper classification of lakes.
- Develop standards for the classification of lakes based on lake characteristics, not stream use classifications. Also include consideration of public/community values of lakes (e.g., water supply, recreation, open space, etc.)

Action Item: Reevaluate Pennsylvania's Integrated List of All Waters listed lakes and remove those that were placed on the list because of lake classification errors and not true impairments.

Goal 3

Improve and develop monitoring efforts to determine how projects and programs improve water quality and/or meet target pollution reductions including TMDLs.

Objective: Continue and improve monitoring and tracking efforts to determine if projects and programs implemented to address NPS problems are making water quality improvements and addressing TMDLs.

Action Item: Monitor lakes and streams periodically to track improvements and to provide data for TMDL models.

- Provide, enhance, and standardize Quality Assurance/Quality Control (QA/QC) protocols and standard methods for data collection.
- Place data onto a Web-based data system.
- Data needed by the TMDL program should be delineated (specifically by lake) so that appropriate data is collected.

Objective: Maintain or show improvement in water quality, load reductions (measurable environmental results), and environmental conditions in streams and lakes, including habitats and wetlands, as a result of NPS BMP implementation methods.

Action Item: Evaluate efficiency of BMPs and stream bank restorations that have improved the water quality of inlets and lakes.

- Collect baseline water quality data for the inflowing streams and the lake to establish baseline reference.
- Follow implementation with monitoring to measure results upstream and downstream of BMPs.
- Plan for periodic maintenance of the BMP, if needed, as well as periodic monitoring in the future to track beneficial results. Periodic monitoring may also indicate when repair/rehabilitation of the project needs to be considered.

Goal 4

Encourage development and use of new technologies, tools, and technology transfer practices to enhance understanding and use of techniques for addressing NPS pollution.

Objective: Support Pennsylvania's strategy to control and mitigate exotic species that affect aquatic life and recreational uses of Pennsylvania waterbodies and riparian areas in cooperation with the Aquatic Invasive Species Work Group.

Action Item: Support/encourage DEP's participation on the MidAtlantic and Great Lakes Regional Panels on Aquatic Invasive Species and support/encourage DEP's participation on the PA Invasive Species Council.

Action Item: Continue participating in the Ballast Water Management Initiative of the Council of Great Lakes Governors.

Action Item: Continue DEP's legal counsel participation in the Clean Water Act litigation related to ballast water management.

Action Item: Support/encourage the development of the statewide Invasive Species Management Plan through the PA Invasive Species Council with special attention to the aquatic invasive species.

Action Item: Agencies (DEP, DCNR, Pennsylvania Fish and Boat Commission (PFBC), Pennsylvania Lake Management Society (PALMS), Sea Grant, and others) to continue efforts to publicize the problems associated with aquatic invasive species and provide information on how to prevent their spread.

Action Item: If resources are available, coordinate with other partners (DCNR, PFBC, etc.) to develop invasive species outreach programs that encourages and guides citizens to monitor and control the spread of invasive aquatic and riparian species in order to protect native populations (including endangered, threatened, and special concern species) and aquatic life uses of waterbodies.

Action Item: Assemble an information packet of educational materials and Web-based information about invasive species to be given to the general public upon request.

Action Item: Distribute information and various publications on invasive species threatening Pennsylvania waterways and riparian habitats at conferences and through the watershed academy. (DEP has newly prepared publications, PFBC has one, and DCNR has similar initiatives).

Action Item: If funding is available, coordinate with PALMS and DCNR and administer a pilot Invasive Species Workshop under the Watershed Academy program and through the Citizens' Volunteer Monitoring Program (CVMP) for watershed specialists and watershed groups.

Objective: Support conferences and outreach events for information dissemination of current and innovative technologies on lake management.

Action Item: If funding is available, conduct a pilot project on the use of aquatic weevils on Eurasian watermilfoil in a Pennsylvania lake to determine feasibility and efficacy.

Action Item: If funding is available, continue to hold and support annual lake conferences on lake management issues; and support regional workshops.

Action Item: Encourage the use of in-lake treatments to mitigate NPS generated within the lake as a tool to be used concurrent with watershed implementation that mitigates incoming NPS.

Action Item: Develop information and outreach on innovative lake management tools to distribute to state and federal agencies involved in issuing permits to keep them informed and updated.

Objective: By 2010, expand the availability of technical and educational resources on lake management and restoration issues through a public clearinghouse to provide outreach to public and private lake managers, owners, and stakeholders.

Action Item: If resources are available, DEP to provide information on state lake databases, lake assessments, and lake water quality via a lake page/section on the DEP Web site and establishment of a Web-based database that can be used to share and input data.

Action Item: Providers of technical assistance to watershed groups need to include lake professionals. As long as funds are available, the Consortium for Scientific Assistance to Watersheds (C-SAW) program provides this resource; PALMS is a program partner.

Action Item: The various lake interests (DEP, PALMS, and consultants) need to make a better connection with university limnology professionals and others to communicate and share information across all lake interests, including water suppliers and lake users.

- Provide a Web site area (at PALMS and DEP) for communication of research subjects in limnology.
- Include lake drinking water sources/information on lake databases and lake Web sites.

Action Item: Support the development of county-wide cooperative and information sharing efforts.

Action Item: The various lake interests (DEP, PALMS, etc.) need to make a connection with sportsman interest groups such as Bass and Trout Unlimited.

Goal 5

Assure implementation of appropriate BMPs to protect, improve, and restore water quality by using or enhancing existing financial incentives, technical assistance, education, and regulatory programs.

Objective: By 2010, disseminate new information and outreach materials on NPS issues for municipalities, watershed groups, and local stakeholders.

Action Item: If resources are available, provide/support annual lake conferences in Pennsylvania for outreach to lake stakeholders to disseminate the latest information on lake management BMPs and techniques.

Action Item: Provide local entities (county governments, townships, and municipalities) with language, ideas, and templates to help write and enact protective zoning and develop ordinances on watershed planning, stormwater management, septic management, road development and maintenance, open areas, green development, riparian area management, and groundwater protection.

Action Item: Provide basic limnology, lake biology, and management information to the Watershed Academy and other outreach events to reach the lake use population as well as county conservation districts.

Action Item: If resources are available, develop a funding source designed for the mitigation of invasive aquatic vegetation (control or eradication).

F. Silviculture

The major NPS pollution concern with silvicultural activities is soil E&S loading to surface water from timber harvesting and road construction. BMPs have been used to reduce the effects of such problems. Chapter 102 of DEP's rules and regulations requires that an E&S plan be developed for every earth disturbance activity. Implementation of program activities are shared by DEP and county conservation districts, including the processing and issuance of earth disturbance permits, complaint handling, site inspections, and compliance activities.

Forestry Initiative of Pennsylvania

The Sustainable Forestry Initiative of Pennsylvania (SFI of PA) is a coalition of private companies, timber harvesters, and forest practitioners. They have developed a landowner packet containing information intended to help landowners understand timber harvesting and resource management. The SFI of PA also does training on forestry BMPs for forest practitioners. For more information, go to: www.sfiopa.org.

DCNR - Bureau of Forestry

The Bureau of Forestry is devoted to the long-term stewardship of Pennsylvania's forests. Rural and Community Forestry Section is responsible for the Cooperative Forest Assistance (CFA) Program for state and private forestry. It is also responsible for the conservation education efforts of the Bureau of Forestry. Service foresters are available to landowners to assist them in understanding, managing, and utilizing the forest resource. The Bureau of Forestry is also a partner with the SFI of PA. Maintaining and protecting the quality of water on state forest lands continues to be one of the highest priorities. For more information, go to: <http://www.dcnr.state.pa.us/forestry/index.aspx>.

State Forest Resources Management Plan (SFRMP)—Pennsylvania's state forests represent one of the largest expanses of public forest in the eastern United States. With increasing pressure on the state forest, the Bureau of Forestry initiated a strategic planning effort to address the issue of long-term sustainability. The SFRMP addresses several water quality/NPS pollution issues. For more information, go to: www.dcnr.state.pa.us/forestry/sfrmp/water.htm.

The Forest Stewardship Program (FSP) was authorized under the Forestry Title of the 1990 Farm Bill. The aim of the program is to provide information, education, and technical assistance to private forest landowners. The program's educational component disseminates this information primarily through workshops and multimedia public service messages. The program's technical component provides landowners with one-on-one assistance.

The Forestland Enhancement Program (FLEP) was part of the 2002 Farm Bill. FLEP replaces the Stewardship Incentives Program (SIP) and the Forestry Incentives Program (FIP). FLEP provides for technical, educational, and cost-share assistance to promote sustainability of the nonindustrial private forests. For more information, go to: www.fs.fed.us/spf/coop/programs/loa/flep.shtml.

EPA has grant funds and low interest loans available for forest projects. They include the NPS Management Program (Section 319) and the Clean Water State Revolving Fund (CWSRF). Managers of state and private forests as well as private organizations can use funding for forest management projects and practices that reduce water pollution. For more information, go to: <http://cfpub.epa.gov/fedfund/index.cfm> and select keyword “forests.”

Green Certification

Green Certification involves an evaluation of the management practices against objective and regionally appropriate standards of sustainable forestry. This project provides a valuable tool for obtaining an independent evaluation of the states’ forest management practices. This evaluation has been completed for all 2.1 million acres of Pennsylvania’s state forest land and received Green Certification. The Scientific Certification System (SCS) Forest Conservation Program is a third-party forest management certification program designed to distinguish and recognize “well-managed” operations in which timber products are produced in a manner that sustains the timber resource, maintains the forest ecosystem and meets minimum financial and socioeconomic criteria.

Research

PSU–School of Forest Resources is working with the DCNR–Bureau of Forestry and the U.S. Forest Service to develop the state’s FSP awareness and knowledge efforts. Many of these elements contain research components that provide further refinement to extension programs. For more information, go to: <http://vip.cas.psu.edu/>.

Pennsylvania’s Forest Landowner Associations

Providing educational opportunities to Pennsylvania’s private forest landowners is an important objective for the 21 local and regional forest landowner associations in Pennsylvania. Although each group is independent, and missions and membership policies differ, most use meetings, field demonstrations, tours, seminars, and newsletters to provide information about forests and sound forest management to their members and to people in the local communities. In addition to exposure to the latest forest stewardship and management principles from forestry professionals, the associations provide the opportunity to meet and share woodlands experiences with other woodland owners in the community. For more information, go to: <http://vip.cas.psu.edu/Associations.html>.

Allegheny National Forest

The U.S. Forest Service is responsible for managing the forest resources within the Allegheny National Forest, located in northwestern Pennsylvania. A Forest Plan, developed in 1986 and revised in 2006, contains NPS pollution control and forestry practices for the entire forest as well as standards and guidelines for specific management areas. These include standards such as filter strips, stream crossings, road drainage and runoff, road surfacing, and erosion control and stabilization measures. For more information, go to: http://www.fs.fed.us/r9/forests/allegheny/projects/forest_plan_revision/.

Objectives/Action Items of the Silviculture Work Group

Goal 1

Improve and protect water resources as a result of NPS Management Program implementation efforts. Show water resource improvements by measuring reductions in sediments, nutrients, and metals or increases in aquatic life use, riparian habitat, wetlands, or public health benefits. By 2012, through combined program efforts, remove 500 miles of streams and 1,600 lake acres that are identified on Pennsylvania's Integrated List of All Waters as being impaired because of NPSs of pollution.

Objective: Provide effective communications with 520,000 woodlot owners and 4,000 forest practitioners managing 13 million acres of private woodland on forest BMPs for silvicultural activities.

Action Item: DCNR Bureau of Forestry and its partners will improve outreach and communications with and between organized groups of forest landowners such as the 23 woodland owner associations in Pennsylvania.

Action Item: Distribute forest landowner packets to inform landowners of their responsibility for minimizing NPS pollution on timber harvesting operations.

Action Item: Provide periodic notices/articles on forest BMPs to cooperating agencies/forest groups for their newsletters, Web sites, etc.

Action Item: Develop and distribute tour brochures showing proper implementation of BMPs at demonstration sites.

Action Item: Provide training on silvicultural NPS BMPs for forest landowners; include on-site visits with loggers and /or foresters of active harvest operations.

Goal 2

Coordinate with county conservation districts, watershed groups, local governments, and others in the development and implementation of 34 WIPs meeting EPA's Section 319 criteria to protect and restore surface and groundwater quality.

Objective: Provide training to forest practitioners on using water quality BMPs for silvicultural activities.

Action Item: Continue offering training opportunities through such projects as the Sustainable Forestry Initiative program.

Action Item: Promote and hold training at developed Service Forest Project Areas that have incorporated NPS BMPs for silviculture.

Action Item: Develop a BMP demonstration site for each service forester area that does not presently have one.

Action Item: Develop a video for forest landowners and forest practitioners to show proper implementation of forest BMPs.

Goal 3

Improve and develop monitoring efforts to determine how projects and programs improve water quality and/or meet target pollution reductions including TMDLs.

Objective: To assure that timber harvesting activities are carried out in such a way that the potential for polluted runoff during harvesting is minimized.

Action Item: Use existing regulatory requirements such as DEP's Chapter 102 and 105 programs and Pennsylvania's Clean Streams Law, and promote manuals on timber harvesting BMPs for silviculture activities to ensure water quality is maintained.

Action Item: Develop incentives to increase the use of the recently developed self-evaluation forms for forest landowners and timber harvesters to evaluate BMP installation and effectiveness.

Action Item: Provide a process that a timber harvester can use to voluntarily request assistance, without penalty, to correct a BMP installation problem.

Action Item: Establish baseline silviculture BMP implementation based on current usage and compare five years later to evaluate the effectiveness of BMP training.

Action Item: Develop a "statement of mutual intent" supporting the BMP manual to maintain consistency among practitioners.

Action Item: Develop and make available a timber harvest operations and erosion control field manual that explains proper logging procedures and requirements necessary to protect wetlands and minimize sediment pollution to waterways.

Goal 4

Encourage development and use of new technologies, tools, and technology transfer practices to enhance understanding and use of techniques for addressing NPS pollution.

Objective: To provide the tools to forest landowners and timber harvesters to help them manage forest lands for water quality protection and sustainability.

Action Item: Encourage landowners to enroll in tax incentive programs such as Clean & Green, FSP, cost-share programs such as FLEP, CREP, EQIP, tax incentives, and various forested riparian buffer assistance programs.

Action Item: Explore new technologies and alternative practices such as carbon sequestration to provide forest landowners and practitioners additional options for protecting water quality.

Action Item: Support having adequate technical assistance for development of woodland management plans.

Action Item: Support needed technical services to forest landowners to address water quality issues through state/federal forestry agencies, woodland owner associations, SFI of PA, forest practitioners, and others.

Action Item: Publicize existing data that identifies the need for forested riparian buffers.

Action Item: Develop workshops for landowners, local government officials, and consultants on the benefits of forested riparian buffers.

Action Item: Provide free planting stock to cooperating landowners to establish forested riparian buffers.

Action Item: Increase efforts to have a larger percentage of the new Chesapeake Bay riparian buffer restoration goal be forested riparian buffers.

Action Item: Encourage the use of riparian management zones in woodland management plans.

Action Item: Provide forest landowner workshops on riparian forest management zones, which include an emphasis on spring seeps and intermittent and first order streams.

Action Item: Support the successful FSP of forest stewardship in managing forest resources, including efforts for maintaining/improving water quality.

Action Item: Develop a woodland management plan for forest landowners that addresses the qualities of the Tree Farm Program and the FSP.

Action Item: Increase funding for FSP and explore additional funding from EQIP, CRP, and CREP.

Action Item: Support efforts to increase the percentage of funding levels for forestry BMPs in the current Farm Bill (i.e. EQIP, CRP, CREP) including that 10% of funds be set aside for forestry practices in EQIP and that 20% of all buffers be forested riparian buffers.

Action Item: Develop a strategy to fund water quality forest practices through methods other than direct public funding.

Goal 5

Assure implementation of appropriate BMPs to protect, improve, and restore water quality by using or enhancing existing financial incentives, technical assistance, education, and regulatory programs.

Objective: To utilize trees for water quality improvements by others outside the forest landowner/ practitioners/logger constituency.

Action Item: Work with organizations such as the Pennsylvania State Association of Township Supervisors (PSATS) to provide training for municipal officials on using trees for reclamation efforts on noncoal mining lands.

Action Item: Work with the Urban Tree Canopy Project with counties in southeast Pennsylvania to increase tree cover in urban areas.

Action Item: Promote use of trees for reducing stormwater runoff and increasing “infiltration” thereby reducing NPS pollution loads.

Action Item: Educate the general public about pollution reducing benefits of trees at events such as the Philadelphia Flower Show and Pennsylvania Farm Show.

Action Item: Encourage planting of abandoned coal mine lands with trees promoting carbon sequestration and reducing E&S.

Action Item: Support efforts that result in watershed plans that recognize forest resources as a contributor to reducing NPS pollution in the watershed.

Action Item: Find ways to reach out to industry through efforts such as the Forestry for the Bay Committee.

Action Item: Promote the Backyard Forest Program to encourage forest stewardship by landowners with fewer than ten acres of woodland.

G. Land Disposal

The land disposal category covers several NPSs of pollution, including improper disposal of HHW, illegal dumps, improper land application of municipal biosolids, and malfunctioning onlot sewage treatment systems.

Improper disposal of HHW has been shown to cause significant degradation of surface and groundwaters. This source of pollution is addressed through programs administered by the Bureau of Waste Management. The impact of illegal dumps, both active and abandoned, on waters of the Commonwealth is still largely undefined.

The land application of municipal biosolids, if properly carried out, offers significant nutrient reuse benefits. If not properly managed, however, it can pose a nonpoint threat to surface waters. Pennsylvania’s many onlot sewage treatment systems are also

potential sources of nonpoint pollution to groundwater. Programs regulating these sources are administered by the Bureau of Water Standards and Facility Regulation.

Waste Management

The Bureau of Waste Management oversees implementation of the Land Recycling Program (Act 2), hazardous sites cleanup (Act 108), municipal waste planning and recycling (Act 101), municipal and residual waste management, tanks remediation, Superfund (Comprehensive Environmental Response, Compensation, and Liability Act), Resource Conservation and Recovery Act (RCRA), and multi-site remediation programs. Additional information concerning programs that promote recycling and the proper disposal of HHWs may be found on the Bureau's Web site at:

<http://www.depweb.state.pa.us/landrecwaste/cwp/view.asp?a=1216&Q=442095&landrecwasteNav=>.

Water Standards and Facility Regulation

The Bureau of Water Standards and Facility Regulation addresses land disposal of wastewater in several different ways. The Onlot Sewage Program requires each municipality in the state to develop and implement an official plan dealing with existing and future sewage needs (Act 537, Chapters 71, 72, and 73). The Bureau also supports continued training of municipal Sewage Enforcement Officers (SEOs) and evaluates alternate wastewater treatment technologies according to established protocols.

The Commonwealth has regulated biosolids since 1977. There are currently 15 biosolids composting sites in Pennsylvania, and nearly 400 sites are permitted for biosolids application. Persons processing biosolids for land application must obtain a permit in accordance with PAG-08 Beneficial Use of Biosolids by Land Application. Additional information concerning each of these initiatives can be accessed through the Bureau's Web site at:

<http://www.depweb.state.pa.us/watersupply/site/default.asp?watersupplyNav=>.

Objectives/Action Items of the Land Disposal Workgroup

Goal 4

Encourage development and use of new technologies, tools, and technology transfer practices to enhance understanding and use of techniques for addressing NPS pollution.

Objective: Evaluate denitrification and other alternate wastewater treatment technologies as they are submitted, using DEP Experimental Onlot Technology Verification Program protocols.

Action Item: Pursue testing of denitrification and other alternate treatment technologies using Experimental Onlot Technology Verification Program protocols.

Action Item: Initiate development of performance-based regulations for approval of alternate onlot treatment technologies.

Action Item: Promote use of approved denitrification technology in onlot treatment systems to implement Pennsylvania's Chesapeake Bay Tributary Strategy.

Goal 5

Assure implementation of appropriate BMPs to protect, improve, and restore water quality by using or enhancing existing financial incentives, technical assistance, education, and regulatory programs.

Objective: Provide continued training of 1,152 local SEOs biannually, and promote increased participation by other municipal officials.

Action Item: Continue formalized training for SEOs, emphasizing both the public health and environmental impacts of malfunctioning onlot treatment systems.

Action Item: Provide technical updates as needed to the SEO guidance manual and to DEP regional office staff working in the Act 537 program.

Action Item: Train SEOs and DEP regional office staff on demonstrated alternative treatment technologies for individual homes and community systems.

Action Item: Encourage statewide organizations representing local officials to provide and promote regular opportunities for training in environmental issues, including onlot wastewater management.

Objective: Encourage additional municipalities to develop and update sewage management programs in accordance with Act 537 by 2010. (An estimated 85 municipalities had programs planned or operational in 2003.) Explore regional options for the treatment and disposal of pumped septic wastes.

Action Item: Educate and support local governments in how to build community support for a sewage management program.

Action Item: Continue to support a peer-to-peer information transfer to facilitate the adoption of local sewage management programs.

Action Item: Explore the benefits and feasibility of cooperative inter-municipal approaches to the management of onlot wastewater treatment systems.

Objective: Increase use of the PENNVEST Individual On-Lot Sewage System Repair Program for repair and replacement of malfunctioning systems by 2012. (An average of 32 projects per year were financed between 1994 and 2004.)

Action Item: Increase awareness of the availability of funds for repair and replacement among SEOs and the general public.

Action Item: Encourage active promotion of available funding sources by SEOs when responding to complaints and requests for advice on malfunctioning onlot treatment systems.

Action Item: Investigate the feasibility of designating, upgrading, and promoting wastewater treatment plants throughout the state as regional centers for the treatment and disposal of pumped onlot septic wastes.

Objective: Consider social marketing and other means to enhance public awareness of HHW, and increase the number of participants in HHW collections by 2012. (33,934 participants were reported in 2003.)

Action Item: Work one-on-one with county recycling coordinators to educate the public and municipal officials about the importance of recycling and proper waste disposal and to sponsor local HHW collections.

Action Item: Promote recently developed electronics recycling program and work to establish a network of electronics recycling sites around the state.

Action Item: Reduce the improper disposal of oil by maintaining and encouraging the use of the existing network of oil collection centers throughout Pennsylvania.

Action Item: Consider ways, including social marketing, to revitalize the Home-A-Syst outreach program and promote its widespread use among homeowners in the state.

Objective: Increase the number of regional (intermunicipal, public/private partnership) HHW collections by 2009. (Two were reported in 2003.)

Action Item: Encourage existing regional programs to share their experience with peers and with public and private interests in the HHW field.

Objective: Expand on-farm assessments and collections of the Farm-A-Syst and CHEMSWEEP programs, emphasizing performance-based approaches to environmental management. By 2010, increase the total amount of waste pesticides collected by the CHEMSWEEP program to 2.0 million pounds.

Action Item: By 2008, prepare and distribute two Farm-A-Syst worksheets for management of pastures and animal concentration areas. (Land Disposal)

Action Item: Broaden the Farm-A-Syst program to include poultry industry environmental management systems.

Action Item: Encourage continued coordination of CHEMSWEEP pesticide collections with local and regional HHW collections to maximize impact and make the most efficient use of organizational efforts and program resources.

Action Item: Support the expansion of CHEMSWEEP collection services to nonfarm users of pesticides, including professional applicators, golf courses, landscape services, and pest exterminators.

Objective: Reclaim additional acres of disturbed or degraded lands using biosolids or other recycled by-products by 2008. (An average of 200 acres per year were reclaimed from 2001 to 2003.)

Objective: Utilize existing programs to clean up 50 illegal dumps threatening lakes, streams, groundwater or wetlands by 2012.

Action Item: Develop and distribute outreach materials informing the public of the health, safety, and environmental hazards associated with illegal dumping.

Action Item: Encourage community organizations, sportsmen, watershed groups, and municipal officials to work together to identify, evaluate, prioritize, and clean up illegal dumps in their local areas.

Action Item: Disseminate information describing existing dump cleanup programs, the resources they offer, and results they have achieved throughout the state.

Objective: By 2009, develop and implement a program encouraging rural landowners to clean up farm dumps.

Action Item: Develop and distribute ten county-wide mailings to farmers and other rural landowners informing them of the health, safety, and environmental hazards associated with farm dumps and describing how they can safely clean up dumps and what resources are available to assist in the task.

Action Item: Encourage agricultural organizations, solid waste haulers, and volunteer organizations to work with landowners to evaluate and clean up farm dumps.

H. Other NPS Category

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

Atmospheric Deposition

Substantial amounts of NPS water pollutants are deposited from the air. EPA guidance calls for state NPS Management Programs to recognize the contribution of atmospheric deposition to the NPS-caused water quality problems and take general note of the success of air pollution control programs in reducing atmospheric deposition. States are not expected to abate this source in the context of their NPS Management Programs.

Congress amended the Federal Clean Air Act in 1990 and included in the amendments Title IV to reduce the adverse affects of acid deposition through phased reductions in sulfur dioxide (SO₂) and nitrogen oxides (NO_x) emissions. Phase I began in January 1995 and Phase II in January 2000.

Data collected through 2004 for Pennsylvania indicates that implementation of Title IV has resulted in lower sulfur dioxide emissions and subsequently lower sulfate concentrations in precipitation throughout the state. Likewise, lower nitrogen oxide emissions and resulting nitrate concentrations have been observed. The net affect of the reductions in sulfate and nitrate concentrations in precipitation has been a dramatic and statistically significant reduction in acid rain across the state. Additional sulfur dioxide and nitrogen oxides emission reductions will likely be necessary to provide adequate protection of all acid sensitive aquatic and terrestrial ecosystems.

III. Resource Management in Pennsylvania

A. Pennsylvania's Watershed Approach

Watershed management is driven by people living in or otherwise connected to the 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. 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.

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 plan
5. Implementation
6. Monitoring for success

Results are compared to goals. 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, track land use trends, and determine program effectiveness. In addition, it is DEP's goal to make all information available in a live and usable format to the general public over the DEP Web site.

Over the past 30 years, Pennsylvania has made significant strides toward reducing and eliminating pollution from industrial and municipal wastewater discharges. These efforts have been so effective that as of September 30, 2003 only 5.4% of surface water quality impairment in the Commonwealth can be attributed solely to point sources. The remaining 94.6% is linked to NPSs—abandoned mines, agriculture, urban runoff, failed septic systems, and air deposition—that must be managed comprehensively to achieve meaningful and lasting results. Watershed management emphasizes specific geographic areas and directs attention toward meeting tangible environmental goals.

B. Section 319, NPS Management Program

The Bureau of Watershed Management supports NPS pollution abatement projects with funding through grants under Section 319(h) of the Clean Water Act. To learn more about the Section 319 program, go to:

<http://www.depweb.state.pa.us/watershedmgmt/cwp/view.asp?a=1430&q=482303>.

C. Growing Greener Grants

The state Environmental Stewardship and Watershed Protection Act of 1999 authorizes DEP to allocate nearly \$547 million in grants for AMD abatement, mine cleanup efforts, abandoned oil and gas well plugging, and local watershed-based conservation projects. 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, and other municipalities; county conservation districts; watershed organizations; and other organizations involved in the restoration and protection of Pennsylvania's environment. These grants will support local projects to clean up NPSs of pollution throughout Pennsylvania.

To learn more about Growing Greener go to:

<http://www.depweb.state.pa.us/growinggreener/site/default.asp>.

D. Statewide Surface Waters Assessment Program

Plan for Achieving Comprehensive Assessments

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

Pennsylvania's long-standing monitoring programs are primarily oriented toward identifying water quality problems and taking action to abate pollution. Although the

location of point source discharges is generally well known, and effluent quality from point sources is monitored regularly, NPSs were not well defined and the extent and severity of NPS impacts had not been totally identified prior to 1997. Consequently, a goal of SSWAP is to evaluate unassessed free-flowing streams in Pennsylvania to identify NPS impacts, lesser known point source impacts, and combined NPS/point source impacts and to protect unassessed waters that are found to be of HQ or EV.

Biological screening was conducted on wadeable waters using a modification of EPA's Rapid Bioassessment Protocol (RBP) II, which includes field identification of benthic macroinvertebrates to the family level and an RBP habitat assessment. Each biological screening results in an assessment summary for input to the Section 305(b) assessment database that identifies waters with obvious water quality impairment and those with no obvious impairment.

Integrated Assessment and Listing

In 2004, DEP adopted an integrated format for Clean Water Act Section 305(b) reporting and Section 303(d) listing, which is published biennially. The current report is entitled, the "2006 Pennsylvania Integrated Water Quality Monitoring and Assessment Report" and satisfies the requirements of both Sections 305(b) and 303(d). This report is available on the DEP Web site at:

<http://www.depweb.state.pa.us/watersupply/cwp/view.asp?a=1261&q=480056>. A draft of the 2008 report may be viewed at:

<http://www.depweb.state.pa.us/watersupply/cwp/view.asp?a=1261&q=535678>.

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

The waterbody-specific use support status of Pennsylvania's waters is presented in the 2006 Pennsylvania Integrated Water Quality Monitoring and Assessment 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.

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

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

- Category 4A: TMDL has been completed.

- Category 4B: Expected to meet all designated uses within a reasonable timeframe (3 years).
- Category 4C: Not impaired by a pollutant.

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

Because of the volume of the five-part list, it is only available electronically on DEP's Web site at:

<http://www.depweb.state.pa.us/watersupply/cwp/view.asp?a=1261&q=480056>.

Aquatic Life Use Support

A total of 83,602 miles of stream assessments for aquatic life use support conducted through September 2005 were included in the 2006 Pennsylvania Integrated Water Quality Monitoring and Assessment Report. All stream miles have been assessed to achieve comprehensive coverage based on the current GIS coverage. As of September 2006, 68,333 miles (82% of the assessed miles) supported the designated fish and aquatic life use. A total of 11,136 miles (13%) were reported as impaired for aquatic life use.

The three largest sources of reported impairment were AMD, with 5,497 miles reported as impaired; agriculture, with 4,757 miles of reported impairment; and urban runoff/storm sewers, with 1,883 miles reported as impaired. The major causes of reported impairment on a statewide basis are siltation, metals, nutrients, and pH. Agricultural impairments are due to nutrients and siltation associated with surface runoff, groundwater input, and unrestricted access of livestock to streams. Low pH and elevated concentrations of heavy metals are the result of acid mine drainage and runoff from mine lands and refuse piles also contribute sediment. Increased levels of nutrients and siltation, along with flow variability, are associated with urban runoff.

A complete summary of aquatic life use support is presented in Table 3 of the 2006 Pennsylvania Integrated Water Quality Monitoring and Assessment Report. The table includes stream miles supporting designated fish and aquatic life uses, miles reported as impaired, and miles remaining to be assessed. A complete listing of the sources and causes of observed impairment on a statewide basis is presented in Table 4 of the report.

A graphical representation of stream classifications, designated uses, assessment results, and other information is available on eMapPA, DEP's Web-based GIS system. Links and instructions for use are available through the 2006 Pennsylvania Integrated Water Quality Monitoring and Assessment Report.

Water Quality Network

The Pennsylvania Water Quality Network (WQN) is a statewide monitoring network with 105 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. Currently, 18 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.

Intensive Surveys

Intensive surveys have historically been a key element of DEP's water quality assessment program since their inception in 1965. These chemical and biological stream and lake investigations are conducted to gather background or baseline data on specific streams or lakes: to determine the effects of point and/or NPS discharges on receiving water quality; to provide data in support of administrative or enforcement actions; to determine the source of spills of pollutional 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.

Reassessment Protocol

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

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

For more information, see the following Web site:

<http://www.depweb.state.pa.us/watersupply/cwp/view.asp?a=1261&q=535902>.

E. Groundwater Quality

Major sources of groundwater contamination in Pennsylvania include industrial facilities, underground storage tanks, hazardous waste sites, abandoned landfills, aboveground storage tanks, manure/fertilizer applications, chemical facilities and septic systems.

Specific activities under the groundwater protection, source water and wellhead protection, stormwater management, land recycling, mining and other programs continue to provide significant groundwater protection in Pennsylvania. DEP's *Principles for Groundwater Pollution Prevention and Remediation*, 383-0800-001, available on DEP's Web site, provides guidelines for prevention of groundwater pollution and remediation of contaminated groundwater. The ultimate goal is prevention of groundwater contamination and protection of groundwater uses.

Drinking Water Source Assessments

Source Water Assessments for all public water systems were completed in 2005. The assessments included delineation of the source water assessment areas, completion of a potential contaminant source inventory, and conducting a susceptibility analysis for each drinking water source serving a public water system in Pennsylvania. The drinking water source assessments were of the raw water quality of the source serving the public water system and not the finished water quality after treatment. The objective of the source water assessments was to rank the susceptibility of the drinking water source to existing or potential sources of contamination in the assessment area. These assessments support the implementation of the Drinking Water Program and provide a technical basis to assist voluntary development of local source water protection programs. The Source Water Assessment reports are available at the DEP regional offices, and the results are to be included in public water suppliers' consumer confidence reports.

See the following Web site for more information:

<http://www.dep.state.pa.us/dep/deputate/watermgmt/wc/Subjects/SrceProt/SourceAssessmnt/default.htm>.

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 groundwaters. It is these resources that are most likely to control the quality of streams under baseflow conditions and are most likely to become contaminated through NPS pollution.

Ambient and Fixed Station Network (FSN) monitoring is conducted on a semi-annual basis in selected groundwater basins. An overall report on data collected from 1985 to 1997 has been completed. All monitoring is conducted in accordance with program specific regulations and DEP's *Groundwater Monitoring Guidance Manual*, 383-000-01. The Ambient and FSN monitoring is conducted in accordance with *Pennsylvania's Groundwater Quality Monitoring Network: Ambient and Fixed Station Network (FSN) Monitoring Programs*, 383-3200-009.

F. Lakes Water Quality Assessment

Background

Pennsylvania's definition of a "significant lake" is surface water with public access and a hydraulic residence time of 14 days or more. Pennsylvania now has 215 verified significant lakes totaling 99,022 acres. Another 146 public waterways are used as lakes but do not have a 14-day retention time. Lake assessments are done on both "significant" and "other" lakes with various partners including U.S. Geological Survey, EPA, citizen volunteers, DCNR, ACOE, and consultants. Since 1997, 213 lakes have been assessed using DEP's lake water quality protocol. In the past two years, other data on lakes (i.e., aquatic macrophyte coverage and fishery data) have been incorporated into assessments. Continued lake sampling, along with DEP regional office efforts, is part of DEP's plan for achieving comprehensive assessment.

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

- Lake WQN. A set of lakes is sampled by field office biologists once each summer for five years. Currently, there are 18 lakes in the program.
- Lake TSI studies. Field office biologists sample lakes to determine if phosphorus controls are needed for point source discharges in the watershed or as part of the unassessed waters program. Samples are collected three times in one year (spring, summer, and fall).
- Lake assessments required under a Memorandum of Understanding (MOU) with EPA as part of the unassessed waters program. The collection protocol is the same as for TSI studies. Funding for this program, provided by EPA under a special appropriation grant in 1997, helped fund about 170 lake water quality assessments. That grant was closed as of March 2003. Citizen volunteer monitors were recruited and trained to collect lake data under this program since 2001, and citizen volunteers will continue to contribute to lake assessments through DEP's CVMP. To date, 20 citizen lakes have participated in our assessment program.

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

G. TMDLs

TMDLs can be considered to be a watershed budget for pollutants, representing the total amount of pollutants that can be assimilated by a stream without causing water quality standards to be exceeded.

The Commonwealth continues to work under an MOU with EPA Region 3 that requires TMDL development for all waters on the 1996 Section 303(d) list for AMD-impacted streams. Pennsylvania is scheduled to address the remaining 126 listings from 1996 that require a TMDL by April 9, 2009. The MOU was fulfilled for all 1996-listed non-AMD waters in 2007. To date, Pennsylvania has completed TMDLs for 658 of 2,767 (24%) non-AMD impaired segments currently listed on the Section 305(b) report. TMDLs have also been completed for 595 of the 1,674 (36%) currently listed AMD-impaired segments.

Impaired streams requiring TMDL development will be prioritized. Preparation of watershed restoration plans will be coordinated with TMDL development to ensure implementation funds, including Section 319 grant money, will be targeted to watersheds most in need of restoration and where local support and interest and existing water quality projects can enhance restoration efforts. See the following Web site for more information: www.dep.state.pa.us/watermanagement_apps/tmdl/.

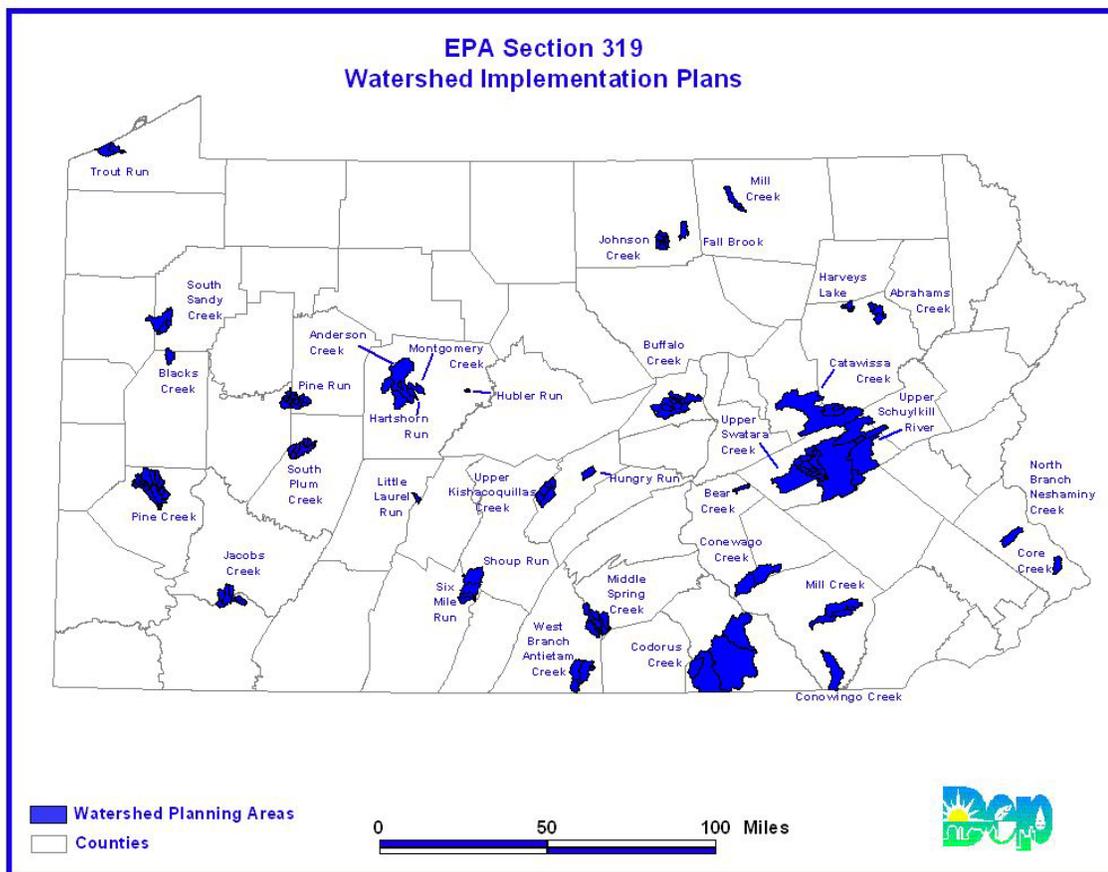
H. WIPs

During FY 2003-2004, Pennsylvania's NPS Management Program initiated the development of stream and lake restoration plans in a number of watersheds throughout the state. These plans are designed to address specific elements, spelled out in EPA Section 319 program guidance, including identification of pollution sources and loads, recommended BMPs, and milestones for project implementation and water quality recovery. Called "WIPs", they are intended to serve as watershed management blueprints for use by local volunteer groups and municipal officials in designing and carrying out NPS pollution control projects with Section 319 grant funds.

The NPS program provides financial support and technical assistance to local groups interested in preparing WIPs, with priority given to groups working actively in watersheds containing significant NPS water quality impairments and one or more TMDLs, where watershed assessments and/or previous restoration studies have been completed.

The NPS Management Program will look at stream miles identified in 34 WIPs to target up to 400 additional miles of streams for restoration to designated uses. This will help achieve objectives under Goal 1. Completed WIPs for these watersheds may be viewed at the following Web site:

<http://www.depweb.state.pa.us/watershedmgmt/cwp/view.asp?a=1430&q=482387>.



I. Watershed Restoration Action Strategies (WRASs)

WRASs contain information useful in developing plans to restore watersheds that do not meet clean water, natural resource, and public health goals. WRASs were completed for 25 State Water Plan watersheds in 2000 and updated through 2004. WRASs contain summary and background information on watershed physical characteristics, geology, land use, DEP designated HQ and EV streams, recreation, water supplies, stream impairment sources, grants, TMDLs, restoration or protection needs, citizens groups, and Sections 303(d)/305(b) listings.

To see the WRASs, go to:

<http://www.depweb.state.pa.us/watershedmgmt/cwp/view.asp?a=1430&q=486118>.

J. Pennsylvania 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 are charged with guiding DEP in the development of a new State Water Plan, to replace one developed between 1975 and 1983, and with approving and recommending approval to the Secretary. Act 220 stipulates that the plan be completed and adopted within five years of the effective date of the legislation and updated every five years thereafter.

This plan seeks answers to the following questions: How much water do we have? How much water do we use? How much water do we need? As a functional planning tool, the updated water plan provides Pennsylvanians with a vision, goals, and recommendations for meeting the challenges of sustainable water use over a 15-year planning horizon. The plan consists of inventories of water availability, an assessment of current and future water use demands, assessments of resource management alternatives, and proposed methods of implementing recommended actions. It also analyzes problems and needs associated with specific water resource activities such as navigation, stormwater management, and flood control. The plan will consist of several products:

- **Data and Analyses.** The water resources data and technical work are the backbone of the plan, which includes the identification of Critical Water Planning Areas. The results of the technical work of the plan will be made available to the public through an interactive Web site.
- **Regional Atlas.** A “coffee table” book of maps, charts, and descriptions of regional water resource issues of Pennsylvania water resources is being developed with specific sections on each of six major watershed basins: Delaware, Upper/Middle Susquehanna, Lower Susquehanna, Ohio, Potomac, and Great Lakes Basins. An interactive version of the Regional Atlas is proposed for the Web.
- **Policy and Analyses papers.** These papers provide information on regional and statewide priorities related to water resources, action agendas to implement recommendations, topical papers on issues such as stormwater management, navigation, water conservation, and goals for the future in each region.
- A public information document “Shared Resource...Shared Responsibility,” illustrating the importance of Pennsylvania’s water planning efforts.

K. DCNR Pennsylvania Rivers Conservation Program

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

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

L. Coastal Nonpoint Pollution Program (CZARA 6217)

The Coastal Zone Act Reauthorization Amendments of 1990 (CZARA) established Section 6217 to protect coastal waters from NPS pollution. This program, administered jointly at the federal level by the National Oceanic and Atmospheric Administration (NOAA) and the EPA, is designed to help protect and restore coastal waters in coastal

states and territories. CZARA requires states to provide for the implementation of management measures for categories of NPSs 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. The Coastal Nonpoint Pollution Program (CNPP) Plan builds on existing programs including the statewide NPS (Section 319) Management Program that address many of the management measures, and cites Pennsylvania's Clean Streams Law as the major authority for implementing the measures. Major initiatives that the CNPP integrates with include the E&SPC Program, the Nutrient Management Program, and the Stormwater Management Program. Additional activities, such as the Clean Boating Initiative, are carried out through partnerships at the local level with the county conservation districts, Philadelphia Water Department, Pennsylvania Sea Grant, municipalities, and nonprofit organizations. Coastal Resources Program staff is currently updating the 5-year and 15-year plans that guide program implementation.

For more information, see Web site: <http://www.dep.state.pa.us/river/cnpp.htm>.

M. Pennsylvania Sea Grant Program

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

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

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

For more information, refer to Web site:
<http://www.pserie.psu.edu/seagrants/seagindex.htm>.

N. EPA Targeted Watersheds Grant Program

The EPA Targeted Watersheds Grant Program (formerly known as the Watershed Initiative) was conceived to encourage successful community-based approaches to restore, preserve, and protect the nation's watersheds. This new competitive grant program is a bold approach to watershed management in that it will provide needed resources to those watershed organizations whose restoration plans are ripe, and who are anxious to achieve quick, yet tangible environmental change.

In 2003, three Pennsylvania watershed groups were among 20 watershed groups nationwide that received a total of \$15 million in federal funding under a new watershed initiative to support community-driven initiatives that protect habitat, improve water quality, and enhance outdoor recreation.

The Christina Basin Partnership will receive a \$1 million grant to support efforts to preserve and protect the Christina watershed that covers 565 square miles in Delaware, Pennsylvania, and Maryland. The Christina watershed group plans to use the funding to further restore and protect the river by implementing agricultural and stormwater best management efforts in targeted areas of the river. The Greene County Watershed Alliance will receive an \$800,000 grant to support efforts to preserve and protect the Dunkard Creek watershed that covers more than 150,000 acres in Pennsylvania and West Virginia. The Greene County Watershed Alliance will use the funding to further restore and protect the streams in the watershed that have been devastated by drainage from abandoned coal mines. The Upper Susquehanna Coalition will receive \$700,000 to protect the headwaters of the Susquehanna River in northern Pennsylvania and New York.

In 2004, Pennsylvania also received funding for the Schuylkill River. At 130 miles in length with over 180 tributaries, the Schuylkill drains an area of 2,000 square miles of southeastern Pennsylvania and is the largest tributary to the Delaware River Estuary. Industrialization and mining in the last two centuries has left the Schuylkill with problems of stormwater runoff, agricultural pollution, active and AMDs, and sewage overflows. The Schuylkill Action Network, a cooperative of federal, state, and municipal entities, was awarded a targeted watershed grant to demonstrate the use of water treatment residuals in agricultural riparian buffers, test the use of a pharmaceutical process to remove phosphorus from effluent, and test the use of reclaimed acid mine drainage discharge as water for thermodynamic power.

For more information, refer to Web site: <http://www.epa.gov/owow/watershed/initiative/>.

O. Delaware Estuary Program

In 1988, Governor Casey of Pennsylvania, along with the Governors of New Jersey and Delaware, signed a package nominating the Delaware Estuary to the National Estuary Program (NEP). The NEP was established by the Water Quality Act of 1987 to promote long-term planning and management in nationally significant estuaries threatened by point source and NPS pollution, development, or overuse.

EPA has provided limited funds to the Delaware Estuary Program. In addition, the majority of those funds have been allocated to the Partnership for the Delaware Estuary, Inc. to focus on educational efforts in the estuary.

P. Great Lakes Initiative

Pennsylvania's 63 miles of coastline on Lake Erie provide membership in the Great Lakes Basin community. Management of this unique region is achieved through the cooperation of two nations, two provinces, eight states, and a myriad of local municipal governments. In 1995, Governor Tom Ridge created the Office of the Great Lakes to

devote full-time attention to Great Lakes issues. Presque Isle Bay is located in the northwest corner of Pennsylvania on the southern shore of Lake Erie. Most of the watershed comprises urban and industrial areas within Erie and Millcreek Township. The abatement of NPS pollution is a critical step in the restoration of beneficial uses in Presque Isle Bay.

Q. Source Water Protection Programs

NPSs of contamination are 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. 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 has been developed to prioritize and facilitate needed action to secure public drinking water quality and manage the risk of contamination.

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

For more information, refer to Web site:

<http://www.dep.state.pa.us/dep/deputate/watermgmt/wc/Subjects/SrceProt/SourceAssessment/default.htm>.

R. Groundwater Quality Protection Policy

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

- Defines groundwater as a resource to be protected;
- Defines pollution as "the contamination of any waters (including groundwater) that creates or is likely to create a nuisance, or to render such water 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, and 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 substance 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 Web site:

<http://www.dep.state.pa.us/dep/deputate/watermgt/wc/Subjects/SrceProt/Ground/default.htm>.

S. CVMP

DEP has an ongoing program, CVMP, that provides support and technical assistance to volunteer monitoring efforts. In Pennsylvania, the CVMP is funded through the NPS Management Program and is an integral part of comprehensive statewide water protection. Almost by definition, the problems of NPS pollution require community-based solutions. Involvement of individuals and organizations in monitoring water quality of streams, lakes, and rivers enables them to become active participants in watershed programs and activities. Volunteer monitoring creates an informed constituency that understands the power and limitations of scientific information and enables the volunteers to become effective stewards of local water resources and part of the solution to problems in their watersheds.

The program works with various groups in collecting data for the following types of projects: bacteriological monitoring for recreational use suitability, restoration monitoring to gauge the effectiveness of restoration projects including stream restoration and CREP projects and citizen lake monitoring which provides data to evaluate lakes. In addition, the CVMP provides technical assistance and guidance to Pennsylvania Senior Environment Corps (PaSECs) involved in monthly and special project monitoring.

Program goals include:

- Helping citizens know their water resources better
- Showing that volunteers collect quality data that is credible
- Acting as a liaison between volunteers, service providers, and DEP

The program has provided workshops, training, and quality assurance sessions for volunteer monitors throughout the state. The technical handbook that includes a study design process, numerous “surveys” for monitoring at differing levels of expertise, and a volunteer monitoring code of ethics provides specific monitoring guidance for volunteers in designing their monitoring plan. The handbook includes useful information to help volunteers determine how the data they collect might be used to meet their monitoring goals.

To help meet DEP needs, the program has worked in partnership with various groups in collecting data. A bacteria-monitoring partnership resulted in data that can be used to determine recreational use suitability of streams for the Integrated Water Quality and Monitoring Assessment Report. This bacteria-monitoring partnership has been revised for 2008 and includes Water Quality Standards staff, CVMP staff, and interested volunteers taking part in needed bacteriological monitoring. A volunteer lake monitoring project also provides data for use in this process. Working both internally and with volunteers, the program is taking part in restoration monitoring to gauge the effectiveness of restoration projects including stream restoration and CREP projects.

The program continues to provide guidance and technical assistance to PaSECs throughout the state. The PaSECs use standardized protocols to assess physical, chemical, and biological indicators in streams monthly and many have study designs to guide their monitoring efforts. This data can be used as a screening tool to determine where further study is needed and to check on the success or failure of restoration efforts. PaSECs’ volunteers have also branched out to take part in other monitoring projects and many partner with numerous organizations in order to meet their monitoring goals.

An outreach activity that the program often takes part in with volunteers is World Water Monitoring Day. This happens every year during World Water Monitoring Month, September 18-October 18. September 18 is World Water Monitoring Day, which is modeled after Watershed Snapshot and hopes to get people into their watersheds throughout the world.

Other program projects include working with 319 program staff and volunteers to monitor sections of streams to assess the impacts from natural stream channel design

structures, supported by 319 monies, and monitoring CREP practices to assess the effectiveness of these practices. Monitoring programs currently under construction include watershed monitoring for stream delisting, healthy waters initiative, and riparian forested buffer monitoring. By working with citizens and partnering with DEP programs, the hope is to integrate more volunteers into projects like screening for stream delisting, restoration monitoring, and riparian buffer monitoring as well as other monitoring ventures in order to meet both volunteer and DEP needs.

For more information about the CVMP, go to:

<http://www.depweb.state.pa.us/watershedmgmt/cwp/view.asp?a=1431&q=492110>.

T. National Monitoring Program in Pennsylvania

Monitoring of both land treatment and water quality is the best way to document the effectiveness of NPS pollution control efforts. The purpose of the EPA's Section 319 National Monitoring Program is to provide credible documentation on the feasibility of controlling NPSs and to improve the technical understanding of NPS pollution and the effectiveness of NPS control technology and approaches.

Nationwide there are only 24 national monitoring sites. Pennsylvania's Section 319 Program has made a substantial commitment to and provided funding for four national monitoring sites, including the only national monitoring site for AMD. These include:

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

U. Watershed Partners

U.S. Geological Survey Programs in Pennsylvania

The Pennsylvania District of the U.S. Geological Survey has conducted NPS investigations for over 20 years. These investigations have been integral parts of local, state, regional, and national programs to assess the extent and sources of NPS contamination, evaluate practices targeted to reduce NPS contamination, and determine pathways and transformation of contaminants in the environment.

For more information, refer to Web site: <http://pa.water.usgs.gov/>.

Delaware River Basin Commission (DRBC)

A breakthrough in water resources management occurred in 1961 when President Kennedy and the governors of Delaware, New Jersey, Pennsylvania, and New York for the first time signed concurrent compact legislation into law creating a regional body with the force of law to oversee a unified approach to managing a river system without

regard to political boundaries. The DRBC includes the four basin state governors and a federal representative appointed by the President of the United States. DRBC programs include water quality protection, water supply allocation, regulatory review (permitting), water conservation initiatives, watershed planning, drought management, flood control, and recreation.

The signatory parties, project review fees, water use charges, and fines, as well as federal, state, and private grants fund the DRBC. DRBC led completion of the Delaware River Basin Plan in 2004 that emphasized an integrated approach, recognizing, for example, that water quantity and water quality cannot be managed separately. NPS control issues are an integral part of the plan. The EPA developed and issued the so-called Stage 1 TMDL for polychlorinated biphenyls (PCBs) in the Delaware Estuary (Zones 2-5) in December of 2003 based on work done by the DRBC after extensive research on NPSs and control options. The DRBC continues to assist member states and EPA with implementation of that TMDL.

For more information, refer to Web site: <http://www.state.nj.us/drbc/>.

ICPRB

Congress established the ICPRB under interstate compact in 1940. Its commissioners are appointed representatives of the participants in the compact--the District of Columbia, Maryland, Pennsylvania, Virginia, West Virginia, and the federal government. ICPRB provides technical support to the signatories on water quality and water resource issues, supplies the public with information on the Potomac River and its tributaries, and helps coordinate the efforts of government agencies and citizen groups in preserving and enhancing the water and environmental resources in the Potomac Basin.

For more information, refer to Web site: <http://www.potomacriver.org/>.

Ohio River Valley Water Sanitation Commission (ORSANCO)

ORSANCO, established by compact in 1948 to control and abate pollution in the Ohio River Valley, is an interstate commission representing eight states and the federal government. Member states are: Illinois, Indiana, Kentucky, New York, Ohio, Pennsylvania, Virginia, and West Virginia. ORSANCO operates programs to improve water quality in the Ohio River and its tributaries, including setting waste water discharge standards, performing biological assessments, monitoring for chemical and physical properties of the waterways, and conducting special surveys and studies. It also coordinates emergency response activities for spills or accidental discharges to the river and promotes public participation in programs, such as the Ohio River Sweep and RiverWatchers Volunteer Monitoring Program.

For more information, refer to Web site: <http://www.orsanco.org/>.

SRBC

All of the SRBC's activities originate from the Susquehanna River Basin Compact, Public Law 91-575, which was signed into law on December 24, 1970. Under the

provisions of the compact, the SRBC may undertake or contract for investigations, studies, and surveys pertaining to existing water quality, effects of operations on water quality, new compounds and materials, and probable future water quality in the basin. The SRBC is directed to promote sound practices of watershed management in the basin, including projects and facilities to address NPS pollution. The SRBC may also acquire, construct, or operate projects and facilities to manage water quality, prevent and control erosion, and promote land reclamation and sound land and forest management.

Since 1990, the SRBC has conducted sediment and nutrient monitoring on the main stem and major tributaries of the Susquehanna River to support efforts to improve water quality in the basin and downstream in the Chesapeake Bay. On a 10-year cycle, the SRBC conducts water quality and biological surveys of the basin's six subbasins. The SRBC continues to be a contractor for DEP doing the technical work to support development of numerous TMDLs in the Susquehanna Basin.

For more information, refer to Web site: www.srbc.net.

V. 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, information/education, and technical assistance projects throughout the Great Lakes region. The Basin Program is coordinated by the Great Lakes Commission in partnership with the USDA (NRCS as the funder), EPA, and the USACOE. Local match is at least 25% of the time total project cost. Pennsylvania's Lake Erie and Lake Ontario watersheds have received a total of over \$500,000 of direct federal funding through this program in the past two grant rounds to address nonpoint-related issues of soil E&S control.

For more information, refer to Web site: <http://www.glc.org/basin/>.

W. Chesapeake Bay Program

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

In 2004, Pennsylvania developed a Chesapeake Bay Tributary Strategy, which is a catalog of activities and measures that, if applied to Pennsylvania's Susquehanna and Potomac Watersheds, generate appreciable nutrient or sediment reductions in order to provide cleaner water resources in the Commonwealth and help restore the water quality downstream in the Chesapeake Bay. DEP continues to work with stakeholders to pursue funding and develop methodologies that will result in "on the ground" projects that will help meet the goals of the Strategy.

For more information, refer to Web site:

<http://www.depweb.state.pa.us/chesapeake/cwp/view.asp?a=3&Q=442886&chesapeakeNav=|29958|>.

X. Nutrient Trading

Nutrient and sediment trading is an approach to improving water quality that utilizes market mechanisms to produce pollutant reductions at lower costs. The voluntary trading program is an option for point or nonpoint sources that exceed their environmental obligations to earn credits that may be sold to others who desire nutrient reduction credits. The program may be used by point sources to comply with a new permitted nutrient limit or by NPSs to implement additional BMPs that help reduce nutrient loadings. Third parties that wish to invest in protecting and advancing the water quality goals of the state may participate in the program as well.

DEP adopted its *Final Trading of Nutrient and Sediment Reduction Credits - Policy and Guidelines*, 392-0900-001, in December 2006, which provides details on how credits may be issued and traded. The initial focus of the program is in the Chesapeake Bay Watershed, with the anticipation that the program will be expanded state-wide to help address water quality issues outside the Chesapeake Bay Basin. The BMPs included in the Nutrient Trading program can be those referenced in the Chesapeake Bay Model or those listed in the Pennsylvania Soil and Water Conservation Technical Guide. This guide includes all standards and specifications for each BMP component.

For more information, refer to Web site:

<http://www.dep.state.pa.us/river/Nutrient%20Trading.htm>.

IV. REGULATORY PROGRAMS

Federal Water Pollution Control Act (Clean Water Act)

The Clean Water Act is the cornerstone of surface water quality protection in the United States. The statute employs a variety of regulatory and nonregulatory tools to sharply reduce direct pollutant discharges into waterways, finance municipal wastewater treatment facilities, and manage polluted runoff. These tools are employed to achieve the broader goal of restoring and maintaining the chemical, physical, and biological integrity of the nation's waters so that they can support "the protection and propagation of fish, shellfish, and wildlife and recreation in and on the water."

For many years following the passage of the Clean Water Act in 1972, EPA, states, and Indian tribes focused mainly on the chemical aspects of the "integrity" goal. During the last decade, however, more attention has been given to physical and biological integrity. Also, in the early decades of the Act's implementation, efforts focused on regulating discharges from traditional "point source" facilities, such as municipal sewage plants and industrial facilities, with little attention paid to runoff from streets, construction sites, farms, and other "wet-weather" sources.

Starting in the late 1980s, efforts to address polluted runoff have increased significantly. For "nonpoint" runoff, voluntary programs, including cost sharing with landowners are the key tool. For "wet weather point sources" like urban storm sewer systems and construction sites, a regulatory approach is being employed.

Evolution of Clean Water Act programs over the last decade has also included something of a shift from a program-by-program, source-by-source, pollutant-by-pollutant approach to more holistic watershed-based strategies. Under the watershed approach, equal emphasis is placed on protecting healthy waters and restoring impaired ones. A full array of issues are addressed, not just those subject to Clean Water Act regulatory authority. Involvement of stakeholder groups in the development and implementation of strategies for achieving and maintaining state water quality and other environmental goals is another hallmark of this approach.

For more information, refer to Web site: <http://www.epa.gov/lawsregs/laws/index.html#cwa>.

Pennsylvania's Clean Streams Law

Pennsylvania's Clean Streams Law, originally passed in 1937, is intended 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..." Many of Pennsylvania's environmental regulations impacting water quality originate under this statute. Title 25 of the Pennsylvania Code covers many water resource issues including among them: NPDES permitting, Water Quality Standards, Erosion Control, Dam Safety, and Waterway and Stormwater Management.

For more information, refer to Web site: <http://www.pacode.com>.

Pennsylvania Nutrient Management Law

Pennsylvania's Nutrient Management Law regulations went into effect on October 1, 1997. The Nutrient Management Law (Act 6 of 1993) was the first phase of nutrient management in Pennsylvania that had statewide implications. Act 6 required farms with two or more animal equivalent units per acre annually to prepare and implement nutrient management plans. Existing operations were required to have plans by one year after the date regulations became effective (October 1, 1997). Plans must be carried out within three years of approval. This deadline may be extended an additional two years under certain circumstances as defined in Act 6. The State Conservation Commission was given responsibility for developing regulations establishing minimum criteria for nutrient management plans that incorporate BMPs. The State Conservation Commission can turn enforcement authority over to local county conservation districts.

In 2002, the State Conservation Commission was required by law to review Act 6 regulations. This extensive review along with a concurrent policy initiative known as Agriculture, Communities, and Rural Environment (ACRE) resulted in a new law (Act 38), which replaced Act 6, and in revised regulations that went into effect October 2006.

Nutrient Management Law and regulations are included on these Web sites:
http://panutrientmgmt.cas.psu.edu/main_laws_regulations.htm and
<http://www.depweb.state.pa.us/watershedmgmt/cwp/view.asp?a=1442&q=513908>.

CAFO Program

The DEP CAFO program has been developed to meet the new federal "Final Rule" regulations that went into effect on April 14, 2003. The states were given one year to revise their regulations to the new federal standard and two years if the changes would require new legislation. DEP revised Chapters 91 and 92 in order to meet the new requirements. The proposed regulations were published in the *Pennsylvania Bulletin* on August 7, 2004, were approved by Independent Regulatory Review Commission, and were subsequently published in the *Pennsylvania Bulletin*.

The current program integrates tools that are already in place to control excess nutrient runoff, such as the Nutrient Management Program under Act 38 with the Chesapeake Bay Program's experience with its permitting requirements. It is the intent of the program to ensure that all CAFOs are constructed and managed in an environmentally sound manner while also ensuring agricultural production that is profitable, economically feasible, and based on sound technology and practical production techniques. A regulations update in October of 2005 brought dry poultry operations into the CAFO program. This effectively doubled the number of farms covered under the CAFO program.

To assure uniform compliance with the provisions of the Clean Water Act, Pennsylvania's Clean Streams Law (35 P.S. §§ 691.1-691.1001) and Sections 1905-A, 1917-A and 1920-A of the Administrative Code of 1929 (71 P.S. §§ 510-5, 510-17, and 510-20), DEP developed the document *Implementation Guidance for NPDES CAFO Permits and Water Quality Management Permits for Manure Storage Facilities*, 390-2100-001. It and related administrative and permit documents supporting this CAFO program are available at:

<http://www.depweb.state.pa.us/watershedmgmt/cwp/view.asp?a=1442&q=513929>.

E&SPC Program

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

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

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

Stormwater Management Act

The Bureau of Watershed Management administers Pennsylvania's Stormwater Management Program mandated by the Stormwater Management Act, 32 P.S. 680.1 *et seq.* (Act 167). Act 167 requires counties to prepare watershed stormwater management plans for designated watersheds. The plans consider hydrologic and hydraulic effects of changes in land use and the quantitative and qualitative impacts on receiving streams. NPS pollution may be considered as one of the components in a plan. The specific issues addressed are:

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

These water quality issues and associated BMPs are generally addressed as the counties carry out the planning process.

When a water quality component is considered, the watershed plan will provide standards and criteria for the NPS water quality controls associated with new development activities. Applicable structural and nonstructural BMPs are recommended within those plans that are unique to the watersheds. The standards and criteria in the plan are implemented by local municipalities through their codes and ordinances. If local governments desire, construction projects may be undertaken, as recommended within the plan, to minimize water quality degradation of the receiving streams.

The watersheds designated by Act 167 encompass a main stream and all of its tributaries and may encompass several hundred square miles. In a watershed having an approved stormwater management plan, anyone engaged in the alteration or development of the land which promotes earth disturbance or alters the stormwater runoff characteristics, must comply with the requirements of Act 167. Where there is no approved plan, the regulation of stormwater falls under the authority of the Municipalities Planning Code and the applicable level class code.

For more information, refer to Web site:

<http://www.depweb.state.pa.us/watershedmgmt/cwp/view.asp?a=1437&Q=518682&PM=1>.

NPDES

The Commonwealth of Pennsylvania received delegation of the NPDES Permit Program from the EPA on June 30, 1978. The Clean Water Act, Sections 301, 302, and 402 define the NPDES. Article III of Pennsylvania's Clean Streams Law deals specifically with industrial waste. Chapter 92 of 25 Pa. Code sets forth the provisions for administration of the NPDES program within Pennsylvania. It establishes criteria for the content of NPDES permit applications, effluent standards, monitoring requirements, standard permit conditions, permit conditions, public notification procedures, and other requirements pertaining to the NPDES program. As part of the plan to integrate the NPDES program into the existing state permit system, a two-part permitting process was instituted. The two state-issued permits are:

- Water Quality Management (WQM) Part I - NPDES Permit

Any person or facility which discharges pollutants into surface waters within Pennsylvania must obtain a WQM Part I NPDES permit. Included are those facilities that discharge stormwater associated with industrial activity as defined by 40 CFR 122.26(b)(14). The purpose of this permit is to establish appropriate effluent limitations, monitoring and reporting requirements, and schedules (as required) for complying with the terms and conditions of the permit. This permit has a fixed life not exceeding five years.

- Water Quality Management (WQM) Part II - Permits

The WQM Part II permit provides for the approval of plans and specifications for waste treatment facilities and the construction and operation of these facilities, including manure storage facilities. Treatment facilities that discharge directly to surface or indirectly to groundwaters of the Commonwealth are required to obtain this permit.

For more information, refer to Web site:

<http://164.156.71.80/WXOD.aspx?fs=7780d840f80b0000800004ea000004ea&ft=1>.

Onlot Sewage Program

The Pennsylvania DEP Bureau of Water Standards and Facility Regulations addresses land disposal of wastewater. The Onlot Sewage Program requires each municipality in the state to develop and implement an official plan dealing with new system designs as well as creating facilities for local municipalities and the public. Over 1,100 local SEOs are engaged in the inspection of onlot septic systems and enforcement of individual sewage disposal regulations.

For more information, refer to Web site:

<http://www.depweb.state.pa.us/watersupply/cwp/view.asp?a=1260&Q=449298&watersupplyNav=|30160|>.

Biosolids

The Commonwealth has regulated biosolids since 1977. Pennsylvania has approximately 270 wastewater treatment plants that generate nearly 2.2 million tons of biosolids yearly. About 50% of biosolids are land applied. Pennsylvania has 15 biosolids composting sites and nearly 400 sites in the state are permitted for biosolids application. A Beneficial Use of Biosolids by Land Application permit must be obtained by persons processing biosolids for land application. Only state-certified persons may apply biosolids in Pennsylvania.

For more information, refer to Web site:

<http://www.depweb.state.pa.us/biosolids/site/default.asp?watersupplyNav=|30160|>.

V. FEDERAL CONSISTENCY WITH PENNSYLVANIA'S NPS MANAGEMENT PROGRAM

DEP employs an effective mechanism for reviewing federal projects for consistency with Pennsylvania's environmental protection programs. Environmental reviews are coordinated through the Bureau of Regional Coordination and Program Evaluation in the Office of Field Operations. This program provides a centralized review of projects that are required by federal and state statutes to be reviewed for their potential impacts on Pennsylvania's environment. There is a single point of contact within the Bureau that is responsible for resolving conflicts, coordination, and developing a unified departmental position on all comments, approvals, and project recommendations. This process involves coordination with all six of DEP's regional offices. Working in this manner, specialized field staff can provide input into projects where their expertise and experience is invaluable.

Pennsylvania has little federally-owned land and a good working relationship with our federal land management agencies. The management plans for federal lands in Pennsylvania are consistent with the Pennsylvania NPS Management Program. Federal lands in Pennsylvania are managed by the USDA's Forest Service, the Department of the Interior's National Park Service, and the Department of Defense.

Allegheny National Forest

The U.S. Forest Service is responsible for managing the forest resources within the Allegheny National Forest located in northwestern Pennsylvania. Silviculture activities within the forest are closely administered for compliance with NPS pollution controls. The NPS activities are implemented through actual timber sale contract provisions, which are administered and inspected weekly for compliance.

For more information, refer to Web site: <http://www.fs.fed.us/r9/forests/allegheny/>.

National Park Service Sites in Pennsylvania

The National Park Service manages 15 national park units within the Commonwealth. Each unit is managed according to its enabling legislation under the direction of a park superintendent. The basic service-wide document used to interpret statutes and other guidance affecting various facets of administration and management is the 2001 edition, National Park Service Management Policies, which is updated and revised as necessary. Within each park, the superintendent is responsible for water resources management.

For more information, refer to Web site: www.nps.gov/.

Cooperative Multi-Site Agreement (CMSA)

On July 4, 1998, DEP and the Army, Navy, Air Force, and Defense Logistics Agency entered a long-term cooperative agreement linking the federal government's Defense Environmental Restoration Program with Pennsylvania's Land Recycling Program. The structure of the agreement is modeled on Pennsylvania's successful Multi-Site Agreement approach to voluntary cleanups, which prioritizes, consolidates, and schedules all the work so that it can be completed sooner and much more cost-effectively. All branches of the armed services are represented in

the partnership with DEP, thereby streamlining the state-federal relationship and facilitating long-term planning/budgeting.

The CMSA covers not only remedial work at current Department of Defense installations but also addresses formerly used defense sites (FUDS), which is administered by the USACOE. All military properties that are, or in the past have been, subject to environmental evaluations and/or remediation, have been listed in an inventory of approximately 1,076 total sites. The primary goal of the CMSA is to have all sites evaluated and a cleanup program in place at those sites in need of work by September 30, 2010. The agreement will use flexible cleanup standards and site-specific, risk-based approaches, plus other features of the Pennsylvania Land Recycling Program, to provide a “faster track” approach to better protect the environment and return properties to productive use. As of March 2005, Pennsylvania has a total of 1,095 known sites; 572 have been resolved under the agreement, 96 have been scheduled for further remedial action, and 416 have been deferred from any actions under the CMSA. Additional information is available on the Web site at:

<http://www.depweb.state.pa.us/landrecwaste/cwp/view.asp?A=1241&Q=464187>.

VI. PUBLIC PARTICIPATION

All meetings of the Pennsylvania NPS Liaison Work Group are open to the public. The agendas, minutes, and documents are all posted on DEP's Web site in advance of the meeting. For more information, refer to Web site:

<http://www.dep.state.pa.us/dep/subject/advoun/liaison/liaison.htm>.

In updating Pennsylvania's NPS Management Program, DEP has considered the input from state, federal, and local agencies, as well as from the general public.

The Commonwealth annually solicits 319 Grant Project Proposals through public notice in the *Pennsylvania Bulletin* and the DEP Daily Update, on the Web, as well as through mailings to people who have requested to be on our mailing list. Information on all 319 projects is also posted on the Web at:

<http://www.depweb.state.pa.us/watershedmgmt/cwp/view.asp?a=1430&q=482352>.

In an effort to obtain suggestions from the public and to make information accessible, DEP has developed: The DEP Daily Update, a free weekly publication available at <http://www.depweb.state.pa.us/news/site/default.asp> and a World Wide Web site on the Internet at <http://www.depweb.state.pa.us/dep/site/default.asp>.