Underfunded and Polluted:
Solutions to Fund Clean Water in Pennsylvania and the Chesapeake Bay Watershed

PennFuture

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TABLE OF CONTENTS

EXECUTIVE SUMMARY

A rain garden and pavilion overlook the Susquehanna River at the Zimmerman Center for Heritage in Wrightsville, PA.

Photo courtesy of Will Parson, Chesapeake Bay Program

Pennsylvania's role in Chesapeake Bay restoration efforts began in earnest 38 years ago when Governor Dick Thornburgh participated as a signatory to the first multistate Chesapeake Bay Agreement. While some progress has been made since that agreement in 1983, many obstacles still remain. Most persistent is the need for more state funding to achieve $521 million in annual projects to cut water pollution in Pennsylvania's portion of the Chesapeake Bay Watershed—a goal state policymakers chronically miss by at least $325 million a year, and oftentimes more.

There are more than 15,000 miles of polluted streams within Pennsylvania's portion of the watershed, which include the Susquehanna and Potomac River Basins. Both are choked with excess nutrient and sediment pollution, and they will not be restored without needed attention and resources from our state elected officials.

Now is the time to act. To date, Pennsylvania has significantly lagged in meeting milestones established in the Chesapeake Bay Total Maximum Daily Load (TMDL) by 2025—the Bay's so-called "pollution diet" set by the Environmental Protection Agency (EPA).

The benefits include significantly improving water quality and the ecology of the Bay and local waterways, but it also goes beyond the environment. Improving the health and vitality of our rivers and streams can bring new revenues to local economies through construction and maintenance activities, while also addressing flooding, infrastructure and safety concerns. The same practices that improve water quality can also positively impact farm productivity and viability. Clean water in our rivers and streams promotes a vibrant recreation and tourism industry in Pennsylvania as well.

Pennsylvania has a plan in place that identifies practices, policies, programs, and staffing needs to clean up our rivers and streams. The stakeholder-driven Phase 3 Watershed Implementation Plan (WIP) was finalized in August 2019. By the end of 2021, all 43 counties in the watershed will have a unique County Action Plan (CAP), developed by stakeholders in each county that identifies the local problems, solutions, and resource needs to meet county-level targets.

This report describes the pollution problems Pennsylvania faces in the Susquehanna and Potomac River basins and explores the history of restoration efforts. Looking forward, the report puts forth a legislative agenda that achieves the $521 million funding need as well as meets the Commonwealth's Chesapeake Bay TMDL goals.

The policy recommendations made in this report fall under six categories:

1. Funding for State Agency and Technical Assistance Staffing

Clean water goals will not be met without adequate agency staff in place to manage the programs and sufficient technical assistance needed to guide project planning and implementation. To that end, funding in the state's annual budget must match the staffing needs for agencies and technical assistance.

- The Phase 3 WIP estimates the number of full time equivalent (FTE) staff at state agencies needs to increase from 88 to 188 employees. This includes staff at the Department of Environmental Protection (DEP), the Department of Conservation and Natural Resources (DCNR), the State Conservation Commission (SCC), and the Fish and Boat Commission (PFBC).
- The number of staff at County Conservation Districts (CCDs) needs to increase by 75 percent from 186 to 340 FTE to ensure there are enough boots on the ground to get the work done.

2. Policies to Reduce Nutrient Pollution from the Agriculture Sector

Runoff from agricultural lands plays a critical role in the health of our waterways. The agriculture sector represents nearly 75 percent of all watershed-wide reductions Pennsylvania needs to make in order to meet our goals. Agriculture is also the leading cause of local water quality problems in Pennsylvania. Providing assistance to farmers will benefit their operations and help clean up our rivers and streams. We recommend the following policies to reduce nutrients coming off agricultural lands:

- Establish a Pennsylvania Agricultural Cost-Share Program
- Expand Pennsylvania's Reserve Enhancement and Protection (REAP) Tax Credit Program
- Update Pennsylvania's "Clean & Green" Program
- Provide Municipalities the Authority to Enact Streambank Fencing Requirements

3. Policies to Reduce Pollution from Stormwater Runoff

Municipalities play an important role in cleaning up Pennsylvania's third-leading source of water pollution: stormwater runoff from developed surfaces. The following set of policies will help provide assistance to local governments and improve local rivers, streams, and infrastructure:

- Develop a Municipal Stormwater Assistance Program
- Develop a Green Stormwater Infrastructure Grant Program
- Increase Funding to the Dirt, Gravel, and Low Volume Road (DGLVR) Program
- Restore Funding for Act 167 Stormwater Management Planning
- Establish Requirements for Fertilizer Application
- Provide Municipalities the Authority to Enact Stormwater Fees

AGRICULTURE IS ALSO THE LEADING CAUSE OF LOCAL WATER QUALITY PROBLEMS IN PENNSYLVANIA.

Cows crossing a stream on a farm.

Photo courtesy of Chesapeake Bay Program

Forest restoration in Bedford County, PA.

Photo courtesy of Chesapeake Bay Program

4. Policies to Reduce Nutrient Pollution from Forestry-related Practices

Forestry-related practices are some of the most cost-effective means of cleaning up our waterways, including planting streamside forests and increasing the number of trees in our cities and towns. The following policies will accelerate the installation of these critical practices:

- Expand Funding to DCNR's Riparian Forest Grant Program
- Continue and Expand Pennsylvania Infrastructure Investment Authority (PENNVEST) Multifunctional Buffer Grant Program
- Fund TreeVitalize to meet Tree Canopy Goals
- Provide Dedicated Funding for Clean Water Projects
- Establish a minimum 100-foot Riparian Buffer Requirement

5. Funding Pilot County Practices

The Phase 3 WIP includes county-level planning and stakeholder engagement in each of the 43 counties that make up Pennsylvania's portion of the Chesapeake Bay Watershed. During the Phase 3 WIP development, the first four County Action Plans (CAP) were established for Lancaster, York, Franklin, and Adams counties. The state should establish a dedicated and reliable fund that would provide adequate funding for the practices identified in county-level plans.

- Establish a County Action Plan Implementation Fund

6. Funding the Remaining Reductions in the Wastewater Sector

Due to significant investments to upgrade wastewater treatment facilities, wastewater treatment plants have largely met the goals assigned to this sector. However, the Phase 3 WIP identifies additional nutrient reductions through the establishment of an online reporting system in which municipalities can report their efforts to implement onsite septic system inspection and pumping programs, as required by the Act 537 Sewage Facilities Planning Act.

- Include funding in DEP's budget to complete online reporting system

Tables 1 and **2** summarize the policy recommendations provided in this report that would put Pennsylvania on track to meet clean water goals. Table 1 shows the funding needed in the annual state budget to meet the Phase 3 WIP estimated costs. While Table 2 lists additional policies that could help to reduce the amount needed in the annual budget.

We know the path forward. Now it is incumbent upon the General Assembly to invest in our communities and provide the funding needed to clean up our rivers and streams. It's estimated that the economic benefits provided by clean water improvements, such as increases in real estate and recreational opportunities, will increase by $6.2 billion annually compared to an annual investment of $521 million.

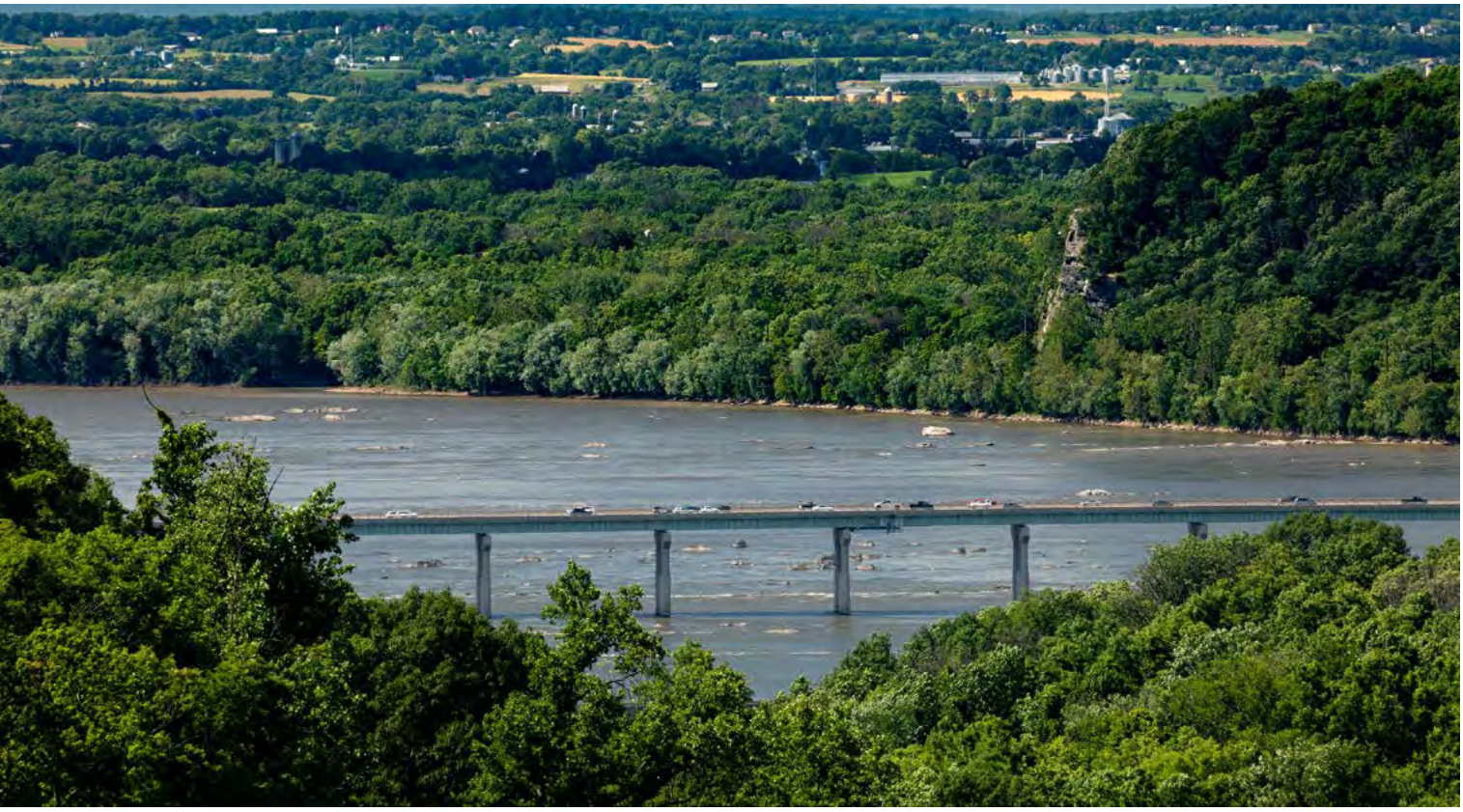
Staffing and Technical Assistance	
Annual Agency Appropriations for Staffing	$52 million
Total	**$52 million**
Agriculture	
Agricultural Cost-Share Program	$100 million
Reserve Enhancement and Protection (REAP) Tax Credit Program	$56 million
Clean & Green Program	$50 million
Total	**$206 million**
Stormwater	
Municipal Stormwater Assistance Fund	$16 million[1]
Green Stormwater Infrastructure Grant Program	$25 million
Dirt, Gravel, and Low Volume Road Program	$5 million[2]
Total	**$62 million**
Forestry-related Practices	
DCNR Riparian Forest Buffer Grant Program	$2.5 million[3]
PENNVEST Multifunctional Buffer Grant Program	$5 million
DCNR TreeVitalize	$4,000
Growing Greener and Keystone Fund	$33 million[4]
Total	**$43 million**
Pilot County Practices	
County Action Plan Implementation Fund	$157 million[5]
Total	**$157 million**
Wastewater	
Onsite Septic Management monitoring and reporting program	$309,000[6]
Total	**$309,000**
TOTAL	**$521 million**

Table 1. Summary of policy recommendations to fund improvements to Pennsylvania's waters and meet the Phase 3 WIP goals.

Sector	Policy
Agriculture	Update Clean & Green Program
Agriculture	Municipal Authority to Enact Streambank Fencing Requirements
Stormwater	Act 167 funding
Stormwater	Pass fertilizer limits
Stormwater	Municipal authority to enact stormwater fees
Forestry-related practices	Establish a minimum 100-foot Riparian Buffer Requirement

Table 2. Summary of policy recommendations that would reduce annual appropriations needed in the state budget.

INTRODUCTION



Highpoint Scenic Vista, York, PA.
Photo courtesy of Will Parson, Chesapeake Bay Program

It is a pivotal time for Pennsylvania's efforts to reduce water pollution and support restoration of the Chesapeake Bay. What state policymakers do, or do not do, over the next five years will determine not only the fate of many of the Commonwealth's rivers and streams in the Susquehanna and Potomac River Basins, but also the fate of America's largest estuary and third largest in the world: the Chesapeake Bay.

This report puts forth a legislative agenda that, if enacted by Pennsylvania's policymakers, would provide the technical assistance, agency support, and public investments needed to put Pennsylvania on the path to meet the U.S. Environmental Protection Agency's (EPA) 2025 Chesapeake Bay Total Maximum Daily Load (TMDL) and improve the water quality of our waterways. The agenda reflects both existing and new state programs needed for reducing nutrient pollution that drains into the Susquehanna and Potomac Rivers and ultimately the Chesapeake Bay.

This agenda offers recommendations that meet the investment needs as documented in Pennsylvania's Phase 3 Water Implementation Plan (WIP), estimated at $521 million per year.[7] Funding remains the single biggest barrier to addressing nutrient pollution in the basin, but a lack of adequate funds should not be used as an excuse to ignore the issue altogether. Instead, addressing this shortfall requires policy innovation, a dedication to clean water, and working collaboratively with all stakeholders, including public, private, and agricultural interests.

Pennsylvania's Pollution Problem in the Chesapeake Bay Watershed

The Chesapeake Bay Watershed is 64,000 square miles and encompasses parts of New York, Pennsylvania, West Virginia, Delaware, Maryland, Virginia, and Washington, D.C. **Figure 1** illustrates the area in Pennsylvania where all the rivers and streams ultimately flow into the Chesapeake Bay.

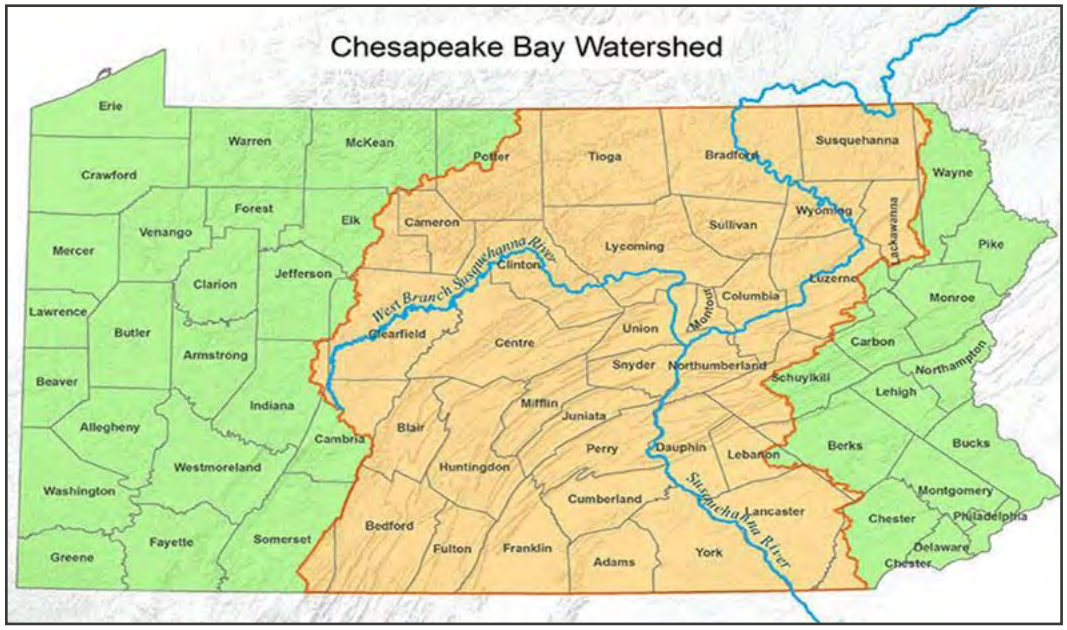


Figure 1. Map of Pennsylvania's portion of the Chesapeake Bay Watershed.[8]

Pennsylvania plays an important role in Chesapeake Bay cleanup efforts because the Susquehanna River is the primary source of freshwater to the Chesapeake Bay, representing 90 percent of all flowing freshwater into the upper half of the Bay. In addition, Pennsylvania has the greatest concentration of rivers to land in the country—a bountiful natural resource that can have, and is having, wide-ranging impacts at home and in the Bay region. However, nearly one-third of Pennsylvania's rivers and streams are polluted. Of the Susquehanna River Basin's 49,000 miles of streams, 15,000 miles are polluted. **Figure 2** shows a map of Pennsylvania's streams that are impaired, which is to say they do not meet their designated standard due to too much water pollution.

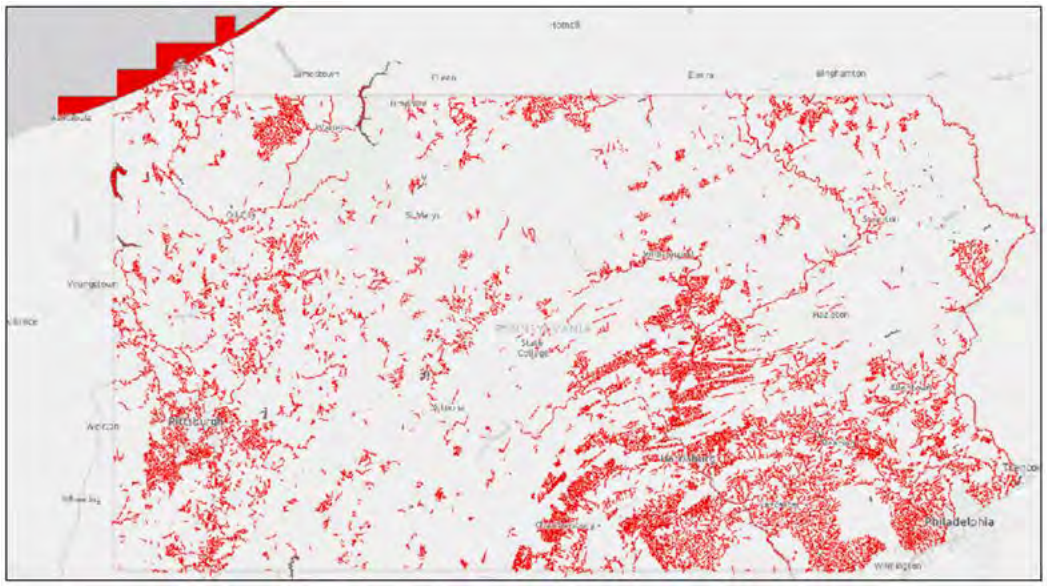


Figure 2. Map of Pennsylvania's polluted rivers, streams, and lakes.[9]

The three main causes of this pollution are, in descending order: agriculture, acid mine drainage, and urban and suburban stormwater runoff.[10] Pollutants are carried down to the Chesapeake Bay where they impact water quality and aquatic life. Algae feed off excess nutrients in greater numbers, starving streams of oxygen and killing off aquatic species. This lack of oxygen creates even more significant problems in the Bay—large dead zones where life cannot be sustained. Excess nutrients and sediment also cloud the water, suffocating oysters and bottom dwelling life while impacting underwater grasses, a critical habitat for blue crabs and other life in the Bay.

The largest source of that pollution—and what makes this region of Pennsylvania so unique and important to pollution reduction—is bountiful agricultural lands. Both water quality and aquatic life in the Bay suffer because of excess nitrogen, phosphorus and sediment. This nutrient pollution comes largely from runoff that carries with it excess fertilizers, manure, and eroded soil, in addition to effluent from wastewater treatment plants and deposition of air pollution.

Our water pollution problem has become so severe that Pennsylvania is required to reduce its load of pollution into the Susquehanna River by 34 million pounds of nitrogen and 756,000 pounds of phosphorus by 2025, as shown in **Figure 3**. This agreed upon reduction is needed, in concert with reductions being made in other Chesapeake Bay states, to greatly improve water quality. Unfortunately, Pennsylvania's history in attaining these results has been murky to date.

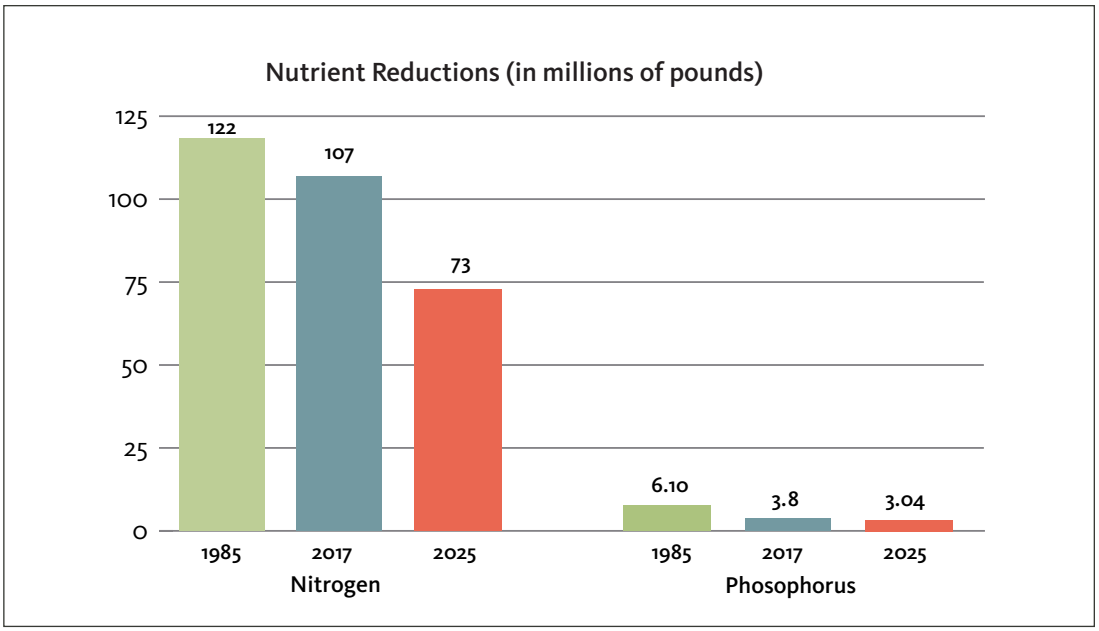


Figure 3. Nitrogen and phosphorus reductions between 1985 and the Phase 3 WIP and remaining reductions needed to meet the 2025 goals.[11]

Pennsylvania's Chesapeake Bay Policy History

The first multi-state effort to restore the water quality in the Chesapeake Bay dates back to the first Chesapeake Bay Agreement in 1983.[12] This marks the first time the Governors from Pennsylvania, Maryland, and Virginia as well as the Mayor of Washington, D.C, came together with the Administrator of the U.S. EPA and the Chair of the Chesapeake Bay Commission to formally agree to address the health of the Chesapeake Bay as a multi-jurisdictional, watershed-wide approach.[13]

In 1987, the jurisdictions agreed to the first set of voluntary commitments and pollution reduction goals, namely a 40 percent reduction in nitrogen and phosphorus by 2000. In 1992, this agreement was amended to focus its attention on nutrient reduction at upstream tributaries, which were and remain the major source of pollution flowing into the Bay. In 2000, the Chesapeake Bay states

developed an even more comprehensive agreement to reduce pollution and promote best land management practices to restore the Bay, including a detailed list of over 100 environmental goals.

But after two decades of voluntary agreements, success was mixed. Progress advanced in some states on land conservation and fish habitats, but overall pollution reduction from agricultural and urban point and nonpoint sources remained. Many important aquatic life species like oysters remained under siege in the Bay and the threat posed by nutrient pollution to human health endured. This lack of overall progress led then-President Barack Obama to issue Executive Order 13508 to call on new efforts to restore the Bay watershed.

Ultimately, the six states and the District of Columbia voluntarily entered into the Chesapeake Bay Total Maximum Daily Load (TMDL) in 2010 with set pollution goals to be accomplished by the end of 2025.[14] In June 2014, the Chesapeake Bay Watershed jurisdictions reaffirmed their commitment to the Bay TMDL and the 2025 deadline in the 2014 Chesapeake Bay Watershed Agreement.[15] In both cases, the TMDL represents the first mandated pollution diet for each of the Bay jurisdictions, including accountability measures for not meeting the plan's metrics.[16]

THE CHESAPEAKE BAY TOTAL MAXIMUM DAILY LOAD (TMDL) ESTABLISHED STRICT LIMITS ON NUTRIENTS AND SEDIMENTS ENTERING THE CHESAPEAKE BAY.

The Chesapeake Bay TMDL established strict limits on nutrients and sediments entering the Chesapeake Bay. The limits are divided among the jurisdictions based on each jurisdiction's contribution of nutrients and sediment. The jurisdictions developed their own Watershed Implementation Plan (WIP) for meeting the pollution reduction goals. These plans are developed with guidance and in coordination with the EPA. This planning process was broken up into three phases, and the jurisdictions have entered the final phase, or Phase 3, in 2019 when Pennsylvania's final Watershed Implementation Plan was submitted to EPA.[17] The Phase 1 and Phase 2 Watershed Implementation Plans were submitted in 2011 and 2012, respectively.

Through EPA's accountability framework and assessments, it was clear that the Commonwealth severely lagged in making the necessary progress to achieve reductions, especially for nitrogen. Pennsylvania's biggest success so far can be attributed to the wastewater sector because of the availability of funds to make significant investments to upgrade wastewater treatment plants and meet the reductions established in their permits.

To bring Pennsylvania's other sectors back on track, Governor Tom Wolf announced the *2016 Pennsylvania Restoration Strategy*, also referred to as the "Reboot", in which the Department of Environmental Protection (DEP), the Department of Conservation and Natural Resources (DCNR), and the Department of Agriculture (PDA) came together to resolve a plan for bringing Pennsylvania back on track for meeting its nutrient and sediment reduction goals.[18] Key programmatic changes that occurred include:

- DCNR overseeing the riparian forested buffer goals;
- Increased agricultural inspections and compliance;
- A Pennsylvania State University survey of unaccounted voluntary practices; and,
- The creation of the first ever Chesapeake Bay Office within the DEP.

Building off the collaborative approach to the 2016 Reboot Strategy, the Phase 3 WIP process brought a new vigor to Pennsylvania's efforts unseen in the Phase 1 or 2 plans. The Phase 3 WIP process was highly collaborative among state agency leaders. DEP also took a bottom-up approach to ensure inclusion of stakeholders at the county level so the plan would have local buy-in and be implementable, thus putting Pennsylvania in a position to meet the 2025 water quality goals once the plan is fully funded.

Pennsylvania's Significant Shortfalls: Inadequate Funding and Falling Short on Nitrogen Goals

The Phase 3 Chesapeake Bay Watershed Implementation Plan provides a roadmap to guide Pennsylvania toward achieving the nutrient reductions that will improve the Bay, but more importantly improve our local rivers and streams. Unfortunately, even with decades of Chesapeake Bay Agreements, a Total Maximum Daily Load, and federal and state investments, the plan calculates an annual shortfall of almost $325 million, out of a total $521 million annual investment need, that is necessary for program development and implementation of practices, public-private collaboration, technical assistance, and agency staffing.

Figure 4 depicts the total annual estimated cost of implementing the Phase 3 WIP. This includes initiatives that were funded by state and federal programs at the time the Phase 3 WIP was written, as well as the funding gap of resources needed to fully implement the Phase 3 WIP.[19] Current spending by the state and federal governments, which covers only 38 percent of the total needed, must not only be maintained, but also increased significantly. Any cuts to current funding levels will lead to an increase in the funding gap.

It is important to note that the funding gap will inherently fluctuate each year based on the level of funding by state and federal governments. This difference could result in wide variations in the funding gap of tens of millions of dollars. The funding gap was calculated by subtracting the total estimated cost of implementing the Phase 3 WIP which includes statewide practices, county pilot practices, and staff and technical assistance needs from the existing and staffing resources in 2018, which is also equal to the 5-year average of state and federal funding documented in the Phase 3 WIP.

The Phase 3 WIP shows state and federal funding ranging from a high of $222 million in fiscal year (FY) 2017 to a low of $117 million in FY2015, representing a stark difference of $105 million over just a three-year period. The Phase 3 WIP does not document fluctuations in staffing expenses over the 5-year period. Ultimately, the funding gap must be closed and restoration of our local rivers and streams must be fully funded.

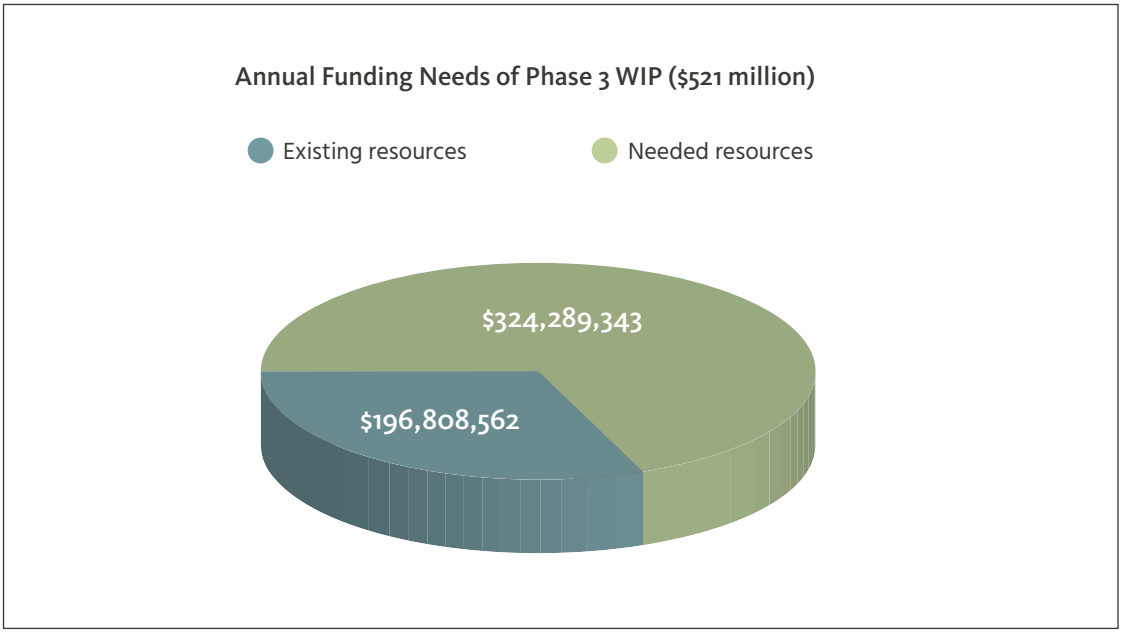


Figure 4. Estimated annual cost of Phase 3 WIP implementation.[20]

In addition to the funding gap, the Phase 3 WIP also has a gap in plans to address 100 percent of the nitrogen goal. Although the Phase 3 WIP process was highly collaborative and generated momentum and stakeholder involvement unparalleled to past efforts by Pennsylvania, it comes up 9.8 million pounds short in addressing nitrogen reductions. The most recent two-year evaluation from EPA calls on Pennsylvania to address the nitrogen gap if the County Action Plans do not account for the remaining reductions needed.[21] This deficiency in planning has also led to two lawsuits against EPA to address this shortfall, including one brought by Maryland, Virginia, and the District of Columbia. The additional practices needed to reach 100 percent of the nitrogen goal will undoubtedly raise the annual costs to achieving the reductions.

Figure 5 shows the projected costs broken into specific components, including estimated sector project costs, pilot county plans, and agency staff and technical assistance needs.

Agriculture accounts for the largest projected cost. This isn't surprising because agriculture remains the largest pollution source, making it the most costly. There are 33,000 farms within Pennsylvania's portion of the Susquehanna and Potomac River watersheds, which is roughly half of all the farms in the state. Most of these farms are small, with only around one-eighth of them large enough to be regulated as a Concentrated Animal Feeding Operation (CAFO) or a Concentrated Animal Operation (CAOs).[22]

The second highest estimated cost comes from implementing practices in the first four pilot counties that developed a County Action Plan (CAP): Lancaster, York, Franklin, and Adams. The Phase 3 WIP utilized a tiered approach to develop all 43 county plans, based on prioritizing the plans in the highest nutrient and sediment producing counties. For example, Lancaster and York counties alone account for 25 percent of the total amount of nutrients and sediment that Pennsylvania is required to reduce.

The third highest estimated cost comes from implementing practices that improve stormwater runoff from developed surfaces. Although Municipal Separate Storm Sewer System permit (MS4) permit requirements account for a significant portion within this sector, other nutrient reductions were

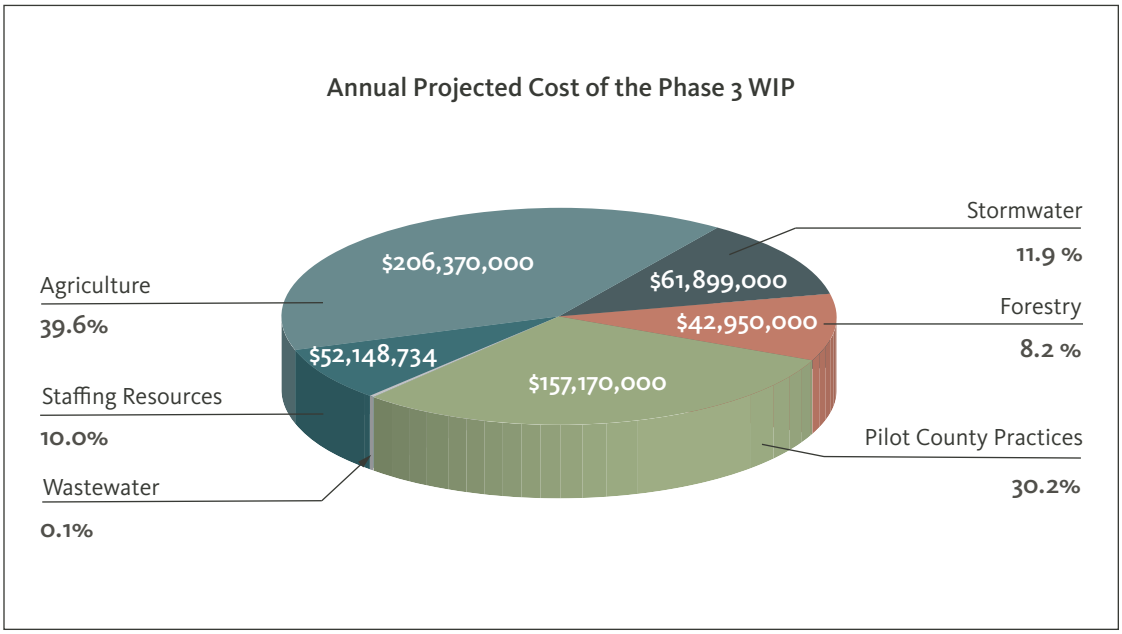


Figure 5. Annual Projected Cost of Implementing the Phase 3 WIP, includes funded and unfunded components.[23]

If Pennsylvania fails to address the funding and nitrogen shortfalls and meet its goals, there are several actions that EPA could take to improve Pennsylvania's progress. In an EPA Expectations document for the Phase 3 WIP, EPA stated they could:

- target federal enforcement and compliance assurance to regulated entities;
- expand NPDES permit coverage to currently unregulated farming operations, municipalities, and businesses;
- redirect Chesapeake Bay or other EPA grant funding to a third party;
- direct Chesapeake Bay funding to identified priorities in the EPA evaluations;
- establish finer scale wasteload and load allocations targeting regulated and unregulated sources including wastewater treatment facilities, farming operations, municipalities, and businesses;
- reduce permit requirements on industrial and municipal wastewater facilities in order to increase requirements for permitted farming operations and towns; and,
- initiate a process to propose numeric water quality standards for nitrogen and phosphorus for streams within the watershed.[25]

Forest Buffer in Lancaster County, PA. Photo courtesy of Will Parson, Chesapeake Bay Program

identified in industrial stormwater permit requirements, voluntary plantings of riparian forested buffers in cities and towns, and practices that result from funding in the Dirt, Gravel, and Low Volume Roads Program.[24] Stormwater runoff is the third leading source of pollution to Pennsylvania's rivers and streams.

The fourth highest cost of the Phase 3 WIP is the estimated agency staff and technical assistance personnel needed to carry out the programs and planning that is necessary to implement all of the practices that, when installed, will meet Pennsylvania's clean water goals. The Phase 3 WIP estimates the total cost at $52 million annually, which is an increase of nearly $24 million beyond current staffing levels.

Forestry-related practices make up the largest remaining portion of the Phase 3 WIP. The cost from forestry-related practices is roughly one half forested riparian buffers (streamside trees) and one half stream and wetland restoration. The remaining costs are less than $1 million for woods and pollinator habitat and tree canopy. Streamside trees and native vegetation are cost effective ways of improving water quality.

The wastewater sector is only 0.1 percent of the total cost of the Phase 3 WIP. The wastewater sector has already invested $1.4 billion in upgrading treatment plants, which has helped keep Pennsylvania on track for its phosphorous goals. The remaining cost in this sector is for DEP to implement an online reporting program to track municipal onsite septic system inspection and pumping programs, as required by Act 537 Pennsylvania Sewage Facilities Act.

The Phase 3 WIP does not break down the existing funding sources into categories that align with the estimated costs of implementation, which makes it difficult to break down the funding gap into estimated costs since many sources of funding are spent on multiple sectors and staffing to administer the programs.

Pennsylvania's Inconsistent Support through Existing Programs

It's easy to focus on the annual shortfall in investments, but it's important not to lose sight of what Pennsylvania is already investing. For the past 5 years, an average of $196.8 million per year has been invested in cleaning up our waterways in the Susquehanna and Potomac watersheds.[26] In Fiscal Year 2019, the total amount spent was $156 million with an additional $28 million on agency staff. This includes 44 percent coming from federal funding sources and 56 percent from state funding.[27]

Table 3 shows the funding streams from state programs between the fiscal years 2015-2019 within the Chesapeake Bay Watershed. It's important to note how the funding source is both diverse yet disparate. Act 13 funding comes from revenue gained from the state impact fee on unconventional fracked gas drilling wells. Growing Greener funding is sourced from a tipping fee on landfills, and agency budgets and programs are sourced from a host of special funds, the general fund, other fees, and some of the programs listed in Table 3. In other words, there is no dedicated source of funding for clean water programs in the Chesapeake Bay watershed.

State Funding Program	Total FY 14-15	Total FY 15-16	Total FY 16-17	Total FY 17-18	Total FY 18-19
ACT 13 - Unconventional Gas Well Funding	$33,891,325	$27,713,077	$25,683,372	$4,064,919	$9,374,464
Ch. 102/NPDES and Ch. 105 Program Permit Processing Fees	$4,578,500	$5,256,512	$4,757,457	$5,120,336	$5,062,058
Conservation District Fund Allocation Program	$2,073,288	$2,074,040	$2,104,184	$2,105,195	$2,130,945
Growing Greener	$9,126,533	$12,953,685	$20,743,372	$9,552,272	$10,166,250
Environmental Education Grants	$16,726	$246,256	$267,641	$270,698	-
Department of Community and Economic Development: Watershed Protection Program	$282,985	$1,002,300	$2,240,000	$375,000	$2,442,858
Dirt and Gravel Roads Program	$16,310,567	$16,353,594	$15,976,856	$16,777,700	$17,157,461
Department of Agriculture	$26,129,555	$31,097,484	$34,966,497	$33,994,499	$36,532,581
Department of Conservation and Natural Resources	$2,282,170	$3,736,666	$8,972,849	$10,714,286	$4,211,800
TOTAL	**$94,691,649**	**$100,433,614**	**$115,712,228**	**$82,974,905**	**$87,078,417**

Table 3. State funding towards pollution reductions in the Chesapeake Bay Watershed.[28]

In addition, Pennsylvania has received critical funding in recent years from the federal government. **Table 4** shows the funding allocated to these programs between the fiscal years 2015-2019 within the Chesapeake Bay Watershed, largely coming from annual congressional appropriations to the EPA and United States Department of Agriculture (USDA).

Program	Total FY 14-15	Total FY 15-16	Total FY 16-17	Total FY 17-18	Total FY 18-19
Federal Funding					
Natural Resource Conservation Service	$12,925,363	$17,616,201	$20,441,044	$19,421,415	$15,324,517
EPA Section 319 Program	$358,351	$3,675,619	$3,182,323	$1,137,168	$2,167,001
TOTAL	**$13,282,714**	**$21,291,820**	**$23,623,367**	**$20,558,583**	**$17,491,516**
Combination of Federal and State Funding					
Chesapeake Bay Program	$6,542,018	$7,914,830	$5,076,147	$10,253,893	$4,998,958
PENNVEST NPS Stormwater	$2,382,455	$1,309,168	$77,193,402	$101,759,521	$46,065,086
TOTAL	**$8,924,473**	**$9,223,998**	**$82,269,549**	**$112,013,414**	**$51,064,044**

Table 4. Funding programs with partial or full contribution from the federal government.[29]

The significant investment made by the state and federal governments must continue—and increase—going forward, otherwise the funding shortfall will only grow. Any cuts made to these programs by Congress or the Pennsylvania Legislature will widen the funding gap and make it even more difficult to achieve the Commonwealth's pollution reduction goals.

According to the Phase 3 WIP, between FY2015 to FY2019, state funding for these programs fluctuated from a high of $115.7 million in FY2017 to a low of $83 million in FY2018. During the state's FY2019 budget, the Department of Environmental Protection's (DEP) Chesapeake Bay Agricultural Abatement Program saw a cut of $2.6 million, and the year before a modest increase of $135,000. It's crucial that the state Legislature build consistency and growth into its annual budgets for these programs.

Similarly, EPA's Chesapeake Bay Program has often been targeted for severe budget cuts. For example, in 2019 the Trump Administration proposed cutting the program from $73 million (in FY2019) to $7.3 million. Congress overrode the former president's proposal and instead increased funding for the program to $85 million. Nonetheless, it's imperative that Pennsylvania's federal legislative leaders continue to support preserving and growing these programs in Congress.

Benefits of Implementing the Phase 3 WIP and Cleaning Up the Pennsylvania's Waterways

Each of us depends on clean water daily, and our farmers, sportsmen and women, and recreation and manufacturing economies falter without clean water flowing in healthy rivers and streams. To that end, Pennsylvania's economy would experience a significant return on investment for efforts to clean up and restore the health of the Chesapeake Bay.

According to a study by the Chesapeake Bay Foundation, the economic benefits of Pennsylvania meeting its pollution reduction goals could exceed $6.2 billion annually.[30] That's because improvements in clean water affect everything from recreational opportunities to real estate.

Benefits of Pennsylvania fully implementing the practices in the Phase 3 WIP include:

- **Increased profitability of food production and agriculture.**

  Implementing agricultural conservation practices, such as those that improve soil health, can improve yields and reduce the costs of adding additional fertilizers and chemicals on croplands. Installing streambank fencing that keeps livestock out of streams will lead to less waste being directly deposited into waterways, which in turn improves herd health and decreases the costs from treating waterborne illnesses. A report by the Chesapeake Bay Commission recounts the successes experienced by a Lancaster County farmer after installing fencing: *"Benefits to farming operations were immediate, too. The quality of the pasture is better. Overall, our cows are cleaner, and it takes less work to prepare them for milking. Since the new fencing, the herd has been healthier, and there's less mastitis."* [31]

- **Increased property values.**

  People have a strong affinity for being near clean streams, healthy parks, and open spaces. Numerous studies show that property values increase near such natural places. The practices in the Phase 3 WIP will clean our streams and increase greenways and open space. A study in southeast Pennsylvania found that, on average, homes located near open spaces had an additional value of $10,000 compared to homes without access to nearby open space, leading to an increase of $16.3 billion for that region.[32] Additionally, research conducted by the Environmental Finance Center at the University of Maryland and American Rivers found that property values near riparian forest buffers increased between 1 to 26 percent.[33]

Farm conservation practices in Lancaster County, PA.
Photo courtesy of Will Parson, Chesapeake Bay Program

Brown Trout Fishing on the Little Juniata River in Blair County, PA.

Photo courtesy of Will Parson, Chesapeake Bay Program

- **Increased recreational activities and associated revenues.**

  Around one-third of Pennsylvania's rivers and streams are polluted. The investments made to clean up our streams will directly lead to increases in more places for recreational pursuits, such as kayaking, canoeing, and swimming. Healthier waterways will lead to healthier fish populations that will increase fishing opportunities and catches. And, more green spaces will create more opportunities for people to be outside in their communities. Increases in recreational opportunities will further increase revenues from tourism. A study by the Theodore Roosevelt Conservation Partnership found that outdoor recreation in Pennsylvania contributes to over 390,000 jobs with a total value of $26.9 billion, including over $7 billion in federal, state, and local tax revenue.[34]

- **Improvements to our drinking water supply.**

  Clean water in the Susquehanna basin is directly tied to public health. In fact, drinking water is the number one consumptive use of water in the Susquehanna basin.[35] Over 6 million people get their drinking water from the Susquehanna basin, including 2 million people living outside of the watershed.[36] A U.S. EPA study found that for every $1 spent on source water protection, drinking water facilities save $27 in treatment costs.[37] Reduced water treatment costs is a benefit that reaches nearly everyone from residential users to food and beverage manufacturing, including breweries and other drink manufacturers.

Student Water Quality Monitoring in Lancaster County, PA

Photo courtesy of Will Parson, Chesapeake Bay Program

- **Reduction of pollution entering our waterways.**

  The Phase 3 WIP only addresses the nutrient and sediment pollution entering our waterways. However, the same practices can also capture or reduce additional pollutants, such as pesticides, oils and gas, and bacteria. For example, keeping livestock out of streams by installing streambank fencing not only reduces sediment erosion from the streambank, but it also decreases bacteria and other harmful pathogens from being directly deposited in waterways. A study by Stroud Water Research Center showed that in addition to reducing pollutants from entering streams, riparian forest buffers increase a stream's capacity to process pollutants, thereby reducing their impact on downstream rivers and estuaries.[38]

- **Climate resiliency.**

  Practices in the Phase 3 WIP, such as increases in riparian forest buffers, urban tree canopy, and green roofs, provide additional benefits to mitigate against the changes brought on by climate change. Trees and other vegetation can reduce runoff, increase evapotranspiration, and protect streambanks from erosion. In more urbanized areas, trees reduce the heat island effect lowering air temperatures, which in turn can reduce cooling costs and energy use that further can lead to reductions in associated health care costs from heat-related illnesses. A study by the U.S. EPA found that the City of Lancaster's Green Infrastructure Plan could reduce heating and cooling costs resulting in reduced energy use of an estimated $2.4 million annually.[39]

Green Roof in Lancaster, PA
Photo courtesy of Steve Droter, Chesapeake Bay Program

Flooding causes erosion and other storm-related issues in streams.

Photo courtesy of Steve Droter, Chesapeake Bay Program

The following section offers a legislative agenda that would meet the $521 million funding goals of the Phase 3 WIP. The agenda is broken into six parts: (1) Funding for state agencies and technical assistance; (2) Policies to reduce pollution from agriculture; (3) Policies to reduce pollution from stormwater runoff; (4) Policies to reduce pollution from forestry-related practices; (5) Funding pilot county practices; and, (6) Funding the remaining reductions in the wastewater sector.

Funding for State Agency and Technical Assistance Staffing

The programs and policies needed to clean our waters require strong agency leadership, staff capacity, and technical assistance to support farmers, local governments, landowners, and other stakeholders. However, Pennsylvania's natural resource agencies have seen their budgets slashed over the past two decades, putting significant strain on their ability to advance this effort. It is critical that state policymakers increase the annual budgets of these agencies in targeted ways to ensure that they can carry out the Phase 3 WIP.

In short, the practices needed to improve our waterways will not happen without adequate funding to ensure program and practice administration, technical assistance, and continued operation and maintenance.

The Phase 3 WIP identifies the number of DEP, DCNR, State Conservation Commission (SCC), and Fish and Boat Commission (PFBC) staff working on clean water goals within the Chesapeake Bay Watershed and recommends increasing their capacity from 88 to 188 full time equivalent (FTE) to provide the technical assistance needed throughout the watershed. In addition, the number of staff at County Conservation Districts (CCDs) is recommended to increase by 75 percent from 186 to 340 FTE. The cost of existing and new staff are broken into sectors in **Figure 6**. Further detail on each of the proposed agency investments is provided below.

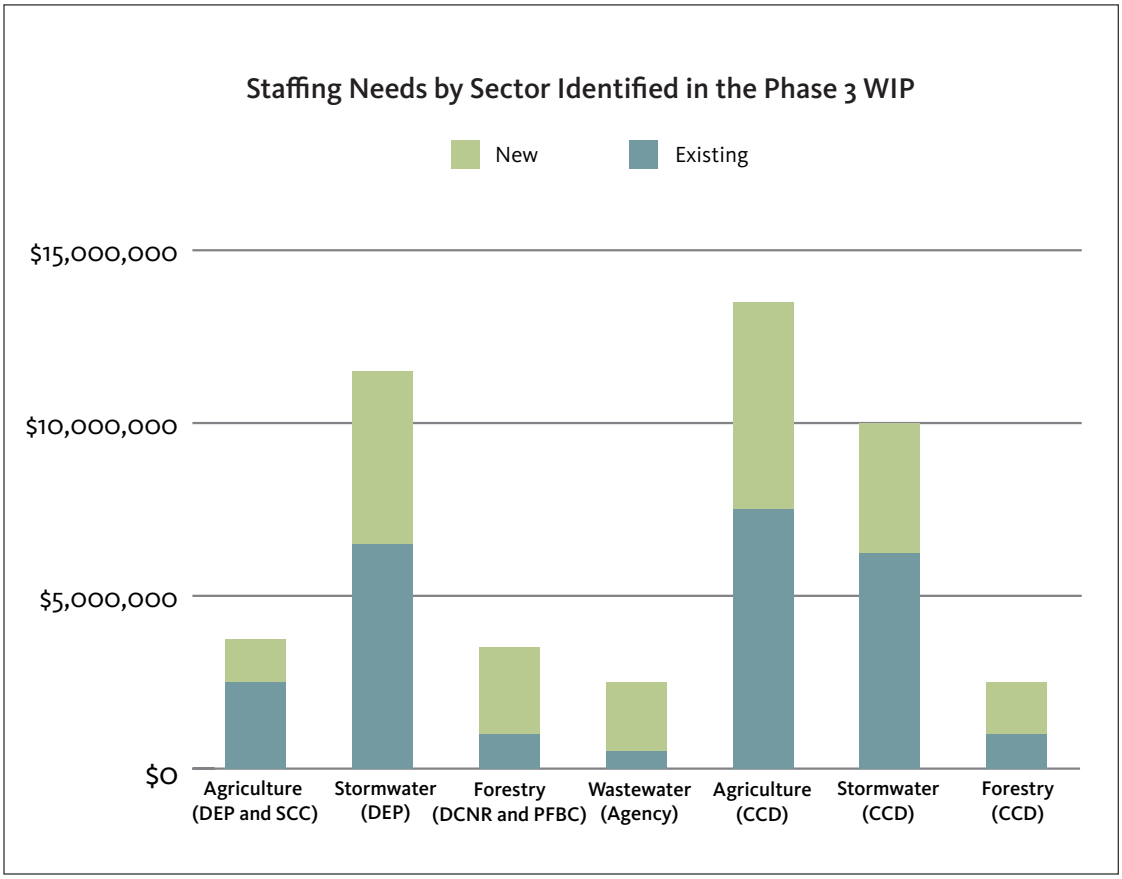


Figure 6. Estimated cost of DEP, DCNR, and CCD staff needed to implement the Phase 3 WIP. [40]

Department of Environmental Protection (DEP)

Since 2002, state funding for DEP has been cut by nearly 40 percent, leading to a 30 percent reduction of staff. The cuts to this agency are particularly dangerous because DEP struggles to meet its minimum regulatory obligations, particularly as it relates to clean water, which threatens Pennsylvania's access to matching federal grants, federal pass-through dollars, and, in some cases, its ability to maintain state authority over its compliance and enforcement programs. [41]

In addition to the existing $9 million spent on DEP staff working on clean water within the Chesapeake Bay Watershed, the Phase 3 WIP estimates DEP needs an additional $6.9 million annually to fully staff oversight and implementation of Pennsylvania's share of nutrient reductions. Achieving clean water goals across Pennsylvania won't be possible without the work of DEP staff. From permitting and compliance to annual report reviewers and inspectors, these staff members play a critical role in advancing and implementing clean water programs and initiatives.

Table 5 shows the existing staff levels and the additional staff needed to fully implement all the best management practices to meet the Phase 3 WIP nutrient and sediment reductions at the Department of Environmental Protection.

Position	Exisiting Staff	Additional Staff
Agriculture		
Agriculture permitting and compliance[42] Agriculture permitting and compliance includes engineers, inspectors, and compliance specialists both at the Central Office and the Regional Offices. These positions are responsible for overseeing NPDES Concentrated Animal Feeding Operation (CAFO) and Water Quality Management (WQM) Permits. Compliance also covers non-permitted plans, such as agricultural conservation plans. Just over half of these positions carry out DEP's compliance program.	12.5	12.5
Stormwater		
MS4 permitting The staff that carry out MS4 permitting duties consist of permit reviewers, inspectors, annual report reviews, and compliance and enforcement. The DEP has also recommended new outreach staff to help education permittees on permit requirements.	9.25	9
Chapter 102 permitting Chapter 102 refers to construction stormwater. Positions required to carry out this permitting include engineers who conduct permit reviews, compliance specialists, and permitting and compliance management.	34.25	14
Water quality monitoring Water quality monitoring is both required and a critical component to DEP's clean water program. Aquatic Biologists monitor Pennsylvania's rivers and streams to assess their health.	7	1
Wastewater		
Water Program Specialists The existing positions identified for the wastewater sector include the Optimization Program, which helps bring struggling treatment plants into compliance. DEP recommends 4 additional staff to assist this program. The Phase 3 WIP also identifies a staff member needed to perform Sewage Management Program Administration and also Web-based Septic System management and permitting system.	1.5	6

Table 5. DEP staff needed to fully implement the Phase 3 WIP.[43]

Department of Conservation and Natural Resources (DCNR)

DCNR oversees hundreds of programs and parks, greenways, open space, and natural areas, all which benefit our rivers and streams. Yet, the Pennsylvania Parks and Forests Foundation estimated that DCNR has a $1 billion infrastructure backlog due to a lack of state funding.[44]

Funding for DCNR is critical to the conservation of our waterways. Our public lands provide vast forested landscapes and natural infrastructure that benefit water quality. At its facilities, DCNR operates wastewater treatment systems as well as stormwater infrastructure. DCNR also administers the state's riparian forested buffer program for streamside trees.

DCNR staff are critical to carrying out the Phase 3 WIP's forestry-related practices, which includes forested riparian buffers, tree canopy, woods and pollinator habitat, forest and natural area conservation, and stream and wetland restoration.[45] In total, these practices need 24 new DCNR employees combined with the existing 8.25 staff to carry out these goals.

In addition to the existing $717,613 spent on DCNR staff working on clean water within the Chesapeake Bay Watershed, the Phase 3 WIP estimates DCNR needs an additional $2 million per year to carry out the forestry-related practices goals in the Phase 3 WIP, such as installing and maintaining riparian forested buffers.

Table 6 shows the existing staff levels and the additional staff needed to fully implement all the best management practices to meet the Phase 3 WIP nutrient and sediment reductions at the Department of Conservation and Natural Resources.

Position	Exisiting Staff	Additional Staff
Program Manager A Program Manager at DCNR to provide watershed-wide (best management practice) BMP leadership and management in meeting the forestry-related practices goals.	0	1
Program Specialists Program Specialists to provide watershed-wide BMP coordination, communication, interagency cooperation, and guidance in meeting the forestry-related practices goals.	3	4
Recreation and Conservation Advisor 2 Recreation and Conservation Advisor 2 to provide grant administration in distributing DCNR funds to on the ground activities.	0.25	4
Foresters Foresters to provide riparian forest buffer outreach and technical assistance.	5	15

Table 6. DCNR staff needed to fully implement the Phase 3 WIP.[46]

Stroud Water Research Center
Photo courtesy of Will Parson, Chesapeake Bay Program

County Conservation Districts (CCDs)

In addition to agency staff at DEP and DCNR, County Conservation District staff are the boots on the ground providing technical assistance and, in some cases, compliance and inspection of farms. County Conservation Districts are a key provider of technical assistance to farmers on installing conservation practices. Additionally, some CCDs serve as a county's Chapter 102 construction and post-construction stormwater permit reviewer and compliance inspector. In addition to the existing $14.3 million spent on CCD staff working on clean water within the Chesapeake Bay Watershed, the Phase 3 WIP estimates an additional 133 staff are needed for the County Conservations Districts at an annual cost of $10.8 million.

Table 7 shows the existing staff levels and the additional staff needed to fully implement all the best management practices to meet the Phase 3 WIP nutrient and sediment reductions at the 43 County Conservation Districts within the watershed.

Position	Exisiting Staff	Additional Staff
Agriculture		
Nutrient Management (NM) Technicians Act 38 requires that Concentrated Animal Operations (CAOs) develop and maintain a Nutrient Management Plan. NM Technicians work with farmers and professional plan writers to review and approve plans.	39	0
Bay Technicians Chesapeake Bay Technicians provide technical assistance, planning, and inspection to local projects.	35	50
Bay Engineers Chesapeake Bay Engineering plan, design, and implement best management practices to reduce nutrient and sediment runoff.	8	3910
Stormwater		
Erosion & Sediment (E&S) Technicians E&S Technicians provide oversight of Chapter 102 (construction stormwater) permit reviews and inspections.	82.5	19
Engineers CCD Engineers provide engineering oversight of Chapter 102 (construction stormwater) permit reviews.	3	34
Forestry		
Resource Conservation Technician Resource Conservation Technicians provide riparian forest buffer outreach and technical assistance.	5	20

Table 7. CCD staff needed to fully implement the Phase 3 WIP.[47]

Other Agency and Contractor Needs

Additionally, the Phase 3 WIP identifies the following staff and support that are needed to fully implement the policies and programs needed for BMP implementation. **Table 8** shows personnel needed by state agencies and outside contractors. The total cost for 17 existing staff and 47 new staff is $7.2 million.

Position	Exisiting Staff	Additional Staff
Department of Environmental Protection		
BMP Verification Tracking and Reporting Milestone Tracking	2	0
EPA Grant Development, Management	0	1
Project Management, Program Evaluation	1	0
Supervisor, Coordination with Bay Program Partnership	1	0
Contract Management,Invoicing, Personnel Support	1	0
Office Manager	1	0
Act 167 Outreach, Compliance and Enforcement	0	2
Real-Time Water Quality Monitoring	0	1
Supervisor for the Chesapeake Bay Office to support County Action Plans	0	1
Support to counties in plan development and implementation	2	6
Contract Management, Invoicing for the Chesapeake Bay Office	0	1
County Action Plan Coordinators	8	10
State Conservation Commission		
Support for REAP and Pennsylvania Farm Bill	0	1
Additional Support for REAP ($10-$20 million increase)	0	2
Technical Assistance to counties	0	3
Policy and District Operations and Outreach	0	1
Department of Agriculture		
Farmland Preservation Conservation Coordinator and Compliance	0	2
Deputy Secretary for Water Quality, Conservation and Farmland Preservation	0	1
Fertilizer Bill Compliance (Inspectors)	0	3
Fertilizer Bill Administration	0	1
Contractor Services		
Technical Support for County Action Plans, including SRBC and EPA	0	9
Facilitation services for County Action Plans	0	1
Communications and Stakeholder Engagement	1	0
Educational videos	0	1

Table 8. Staff and support needed to implement the policies and programs for BMP implementation.[48]

Policies to Reduce Nutrient Pollution from the Agriculture Sector

Nutrient reductions coming from agriculture account for nearly 75 percent of all watershed-wide reductions identified in the Phase 3 WIP, as shown in **Figure 7**. These reductions are based on seven general practices, which are estimated to cost $206.4 million annually:

- **Agriculture compliance.** Compliance, inspection, and enforcement of state and federal requirements, such as Agriculture Erosion and Sediment (E&S) plans, Conservation Plans, and/or Manure or Nutrient Management Plans. Annual cost: $24 million.
- **Soil health**. Specific farming practices that improve the quality, or 'health,' of soil, such as healthy microbe communities and healthy nutrient concentration which in turn can reduce runoff and improve water quality. Practices include: 20 percent of croplands using conservation tillage, 47 percent using no-till, 33 to 50 percent planting non-harvested cover crops, and 50 percent of pastures using prescribed grazing techniques with stream fencing. Annual cost: $21 million.
- **Expanded nutrient management.** Certified nutrient management plans on unregulated farms, including 20 percent non-manured farms and 20 percent of croplands employing the "4Rs" of fertilizer application: "the Right Source, Right Rate, Right Time, and Right Place." Annual cost: $31.7 million.
- **Manure storage facilities.** 90 percent of swine and poultry operations and 75 percent of all other livestock operations have manure storage facilities that meet federal standards. Annual cost: $125.6 million.
- **Precision feeding.** 70 percent of dairy cows feed according to practices that help reduce their contribution to nutrient loads. Annual cost: shown as a negative cost in Phase 3 WIP.
- **Integrated systems for elimination of excess manure.** County or regional plans to address excess manure removal out of the Chesapeake Bay Watershed. Annual cost: $3.3 million.
- **Forested and grass riparian buffers.** Planting of trees or grass areas adjacent to streams with a minimum width of 35 feet. At least 25 percent of non-buffered streamside farmland install trees and 15 percent grass areas. Annual cost: $2.5 million.

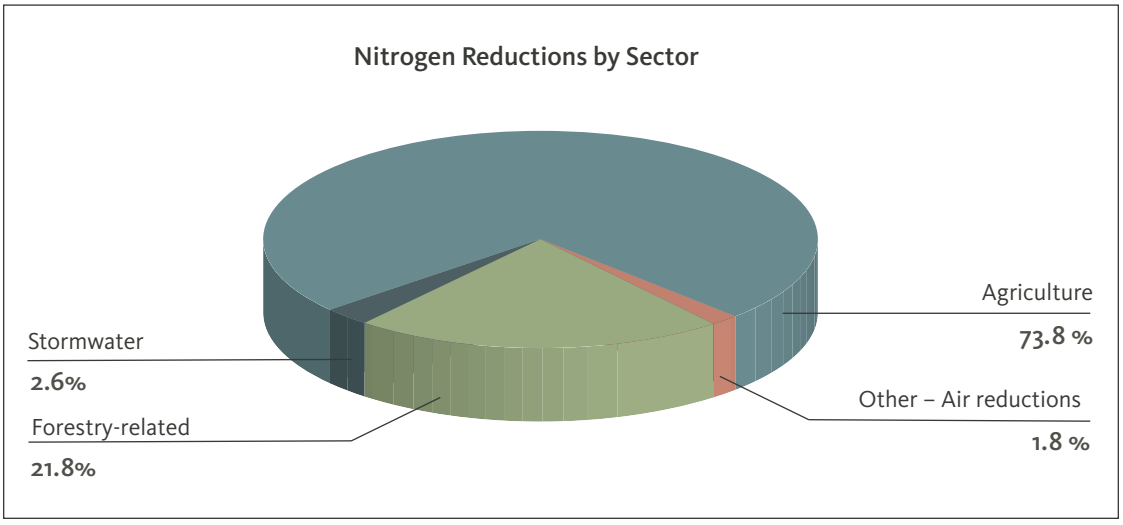


Figure 7. Reductions by Sector for Statewide Actions as identified in Phase 3 WIP. [49]

Addressing these pollution reduction needs will require a diverse mix of policies to incentivize project development, invest in projects, and support public-private partnerships to leverage both state and private sector funding. The following policies, if fully funded, would support the seven general practices described above.

Establish a Pennsylvania Agricultural Cost-Share Program

Ninety-eight percent of all farms in Pennsylvania are family farms with an average net cash farm income of $42,020.[50] While farming is a vital part of Pennsylvania's heritage and economy, farmers are struggling to keep up and many are taking on heavy debt loads.[51] Between 2012 and 2017, Pennsylvania lost 10 percent of its total number of farms.[52] Pennsylvania farmers need assistance to implement conservation practices that may improve their operations and protect our streams. Cost-share programs are one way the Legislature can provide financial assistance to Pennsylvania farmers.

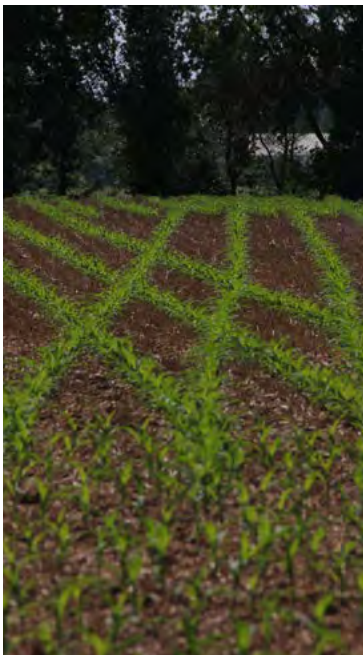
Other Chesapeake Bay states, such as Virginia and Maryland, have agriculture cost-share programs at the state level. The Maryland Agricultural Water Quality Cost-Share (MACS) Program provides farmers with grant assistance up to 87.5 percent of a project's cost.[53] The Virginia Cost-Share Program (VACS) combines state funding with federal funds to cover up to 70 percent of a project's cost.[54] These programs are administered through local conservation districts and provide farmers with the assistance they need to install conservation practices.

There is federal cost-share available for best management practices through the Farm Bill program that a state program could leverage. The U.S. Department of Agriculture (USDA) provides financial and technical assistance to farmers for installing conservation practices on their farmland. These programs are administered by the USDA's Natural Resource Conservation Service (NRCS).[55] These programs provide farmers financial assistance to install conservation practices that improve their land and benefit our rivers and streams. According to the Phase 3 WIP, Pennsylvania counties in the Chesapeake Bay Watershed received on average $17 million per year in funding from NRCS programs between fiscal years 2015 - 2019.

A state agriculture cost-share program could provide critical financial assistance to Pennsylvania farmers who want to install conservation practices on their farmland. A cost-share program in Pennsylvania will require new legislation and state funding, but could play a central role in completing more pollution reduction projects. Such a program should:

- Match contribution from farmers up to a 100 percent rate;
- Be need-based per counties and projects;
- Have dedicated and reliable funding, at minimum, $100 million annually;
- Leverage federal dollars, such as those coming from NRCS;
- Be administered at the local level through the County Conservation Districts;
- Be overseen by the State Conservation Commission; and,
- Include annual reporting requirements to the public on how funds are spent and project outcomes.[56]

In late 2020, Senate Bill (SB) 1272 was introduced that would create such a program, called the Agricultural Conservation Assistance Program.



Brubaker Farms in Lancaster County, PA, uses a variety of sustainable features and best management practices for reducing nutrient runoff, such as buffered streams, a methane digester, and no-till crops.

Photo by Steve Droter, Chesapeake Bay Program

Expand Pennsylvania's Reserve Enhancement and Protection (REAP) Tax Credit Program

Pennsylvania's Resource Enhancement and Protection Program is a tax credit program for farmers, landowners, and businesses to offset the costs of conservation practices and equipment. REAP is administered by the State Conservation Commission and the tax credits are awarded by the Pennsylvania Department of Revenue. Eligible applicants can receive between 50 percent and 75 percent of project costs, up to $250,000 per operation over seven years, for practices such as Conservation or Agricultural Erosion & Sediment Plans, Nutrient or Manure Management Plans, barnyard runoff control, streambank fencing, riparian buffers, manure storage, rotational grazing systems, no-till equipment, and cover crops.[57]

In July 2019, the state Legislature passed the Pennsylvania Farm Bill, which increased the REAP program by an additional $3 million to a total of $13 million. The program was also expanded to allow for up to 90 percent of a project's cost for high-priority practices in a watershed with an approved Total Maximum Daily Load (TMDL) to receive a tax credit, including the Chesapeake Bay watershed. The changes made in 2019 also allow the State Conservation Commission to target up to $3 million of the REAP tax credits in the Chesapeake Bay Watershed.[58]

This was a good first step by the Legislature, but more funding is required to meet the needs of the Phase 3 WIP. In Fiscal Year 2020, the State Conservation Commission received around 400 applications requesting $17 million in REAP tax credits.[59] The state Legislature should increase funding for this program to $56 million annually to allow for more farms to be enrolled and conservation practices implemented.

IN ADDITION TO WATER QUALITY BENEFITS, SUCH AS REDUCING RUNOFF AND STREAM EROSION, STREAM-BANKING FENCING CAN IMPROVE HERD HEALTH AND REDUCE COSTS TO FARMERS ASSOCIATED WITH WATERBORNE ILLNESSES OR PHYSICAL INJURY.

Update Pennsylvania's "Clean & Green" Program

The Clean & Green Program (Act 319) provides landowners with savings towards their property taxes through a preferential tax assessment program that bases property taxes on use values instead of market values. The program is intended to provide an incentive to property owners to preserve farmland, forestland, and open spaces. Since 1974, over 9 million acres have been enrolled in the program. To qualify, a property must be at least ten acres and in Agricultural Use, Agricultural Reserve, or Forest Reserve. Properties under 10 acres can qualify if it is capable of generating a minimum of $2,000 annually in farm income. By law, the Pennsylvania Department of Agriculture must provide tax assessors with use values annually.[60]

Unfortunately, the requirements to enroll in Pennsylvania's Clean & Green Program exclude important required regulations related to agriculture or permitted activities, including Agricultural Erosion and Sediment Control Plan, Manure Management Plan, National Pollutant Discharge System Permit for Concentrated Animal Feeding Operations and a Nutrient Management Plan. Although these plans are required by law, it is estimated that approximately half of landowners receiving a break in their property taxes through the Clean and Green Program do not have the required plans.[61] Updating the Farmland and Forest Land Assessment Act of 1974 to include these requirements for a reduction in property taxes will ensure required conservation plans and practices are installed as already required.

In addition, a change to the Clean and Green Program could be expanded to $50 million annually and leveraged with additional agency funds to provide farmers with technical assistance, if needed, to develop the required plans.

Provide Municipalities the Authority to Enact Streambank Fencing Requirements

Currently, Section 702 of Pennsylvania's Clean Streams Law, 35 P.S. 691. 702, prohibits Commonwealth agencies or political subdivisions from establishing requirements to fence farm livestock out of streams. By repealing or amending this language, the General Assembly would give municipalities the authority to make the decision locally to enact such requirements. In addition to water quality benefits, such as reducing runoff and stream erosion, streambanking fencing can improve herd health and reduce costs to farmers associated with waterborne illnesses or physical injury.[62] Existing legislation, like House Bill (HB) 1389 (2019-20 session), would do just this and give municipalities the power to protect their local streams and rivers from the effects of livestock having direct contact with waterways. HB 1389 provides for flexibility and allows for stream crossings of livestock that complies with DEP guidance on how to do so safely.

A riparian forested buffer – one type of farm conservation practice – in Lancaster County, PA.

Photo courtesy of Will Parson, Chesapeake Bay Program

Policies to Reduce Pollution from Stormwater Runoff

Nutrient reductions from stormwater runoff are based on seven general practices, which are estimated to cost $61.9 million annually:

- **MS4 permit requirements.** Implementation of pollution reduction plans (PRPs) for municipal and highway, including PennDOT and Turnpike Commission, municipal separate storm system system (MS4) stormwater permits. Annual cost: $57.8 million.
- **Riparian forested buffers.** Planting of streamside trees as part of the municipal MS4 permit PRP requirements. Annual cost: $48,000.
- **Control measures for pool and car wash discharges.** The MS4 permit requires new control measures to satisfy illicit discharge into the storm sewer system for pool drainage and car washes. Annual cost: $451,000.
- **Industrial stormwater permit requirements.** Currently the Industrial stormwater permits do not require Pollution Reduction Plans. However, the Phase 3 WIP anticipates some permittees may install voluntary best management practices. Annual cost: $2 million.
- **Fertilizer legislation.** Passage of fertilizer legislation limiting application of nitrogen and phosphorus would lead to a reduction in Pennsylvania's contribution. Annual cost: TBD.
- **Chapter 102 permit requirements.** Chapter 102 refers to Pennsylvania's erosion and sediment control and post-construction stormwater permit requirements. The best management practices required in these permits allow Pennsylvania to receive nutrient and sediment reduction credits towards the TMDL goals. The credits will depend on DEP's ability to inspect BMP function and reporting to EPA. Annual cost: permittee's responsibility.
- **Dirt, Gravel, and Low Volume Road.** This program administered at the county level through the County Conservation Districts provides funding to local road-owning entities, usually municipalities, to provide maintenance to dirt, gravel, and/ or low volume roads. It improves water quality by reducing runoff and sediment in our streams. Annual cost: $1.7 million.

Develop a Municipal Stormwater Assistance Program

Reductions from the stormwater sector play an important role in the health of local waters. Runoff from developed surfaces is the third leading cause, and growing, of water pollution in our streams. The Phase 3 WIP identified the annual costs of BMPs for stormwater reductions coming from the stormwater sector. Most of the cost associated with this sector comes from requirements in the MS4 permit. In developing an assistance fund for municipal stormwater management, the state could provide a cost-share program to:

- Match municipal costs of BMP planning, design, and implementation, at minimum, 50 percent;
- Be funded annually at no less than $16 million;
- Be awarded based on financial need of municipality;
- Provide preference to project locations in watersheds deemed impaired by DEP and EPA; and,
- Prioritize projects in environmental justice communities, as defined by DEP.[63]

INCREASING FUNDING TO THE DIRT, GRAVEL, AND LOW VOLUME ROAD PROGRAM WOULD HELP MUNICIPALITIES, ESPECIALLY IN MORE RURAL COMMUNITIES, IMPLEMENT STORM-WATER PRACTICES AND IMPROVE WATER QUALITY.

Develop a Green Stormwater Infrastructure Grant Program

Create a Green Stormwater Infrastructure Grant program at DEP and fund it, at minimum, $25 million annually.[64] Currently, there is no central funding mechanism for green stormwater projects at the state level, aside from PENNVEST, that are open to any type of water project.[65] This grant program would provide financial assistance to projects in the planning, design, or implementation phase. It could also be leveraged by municipal water utilities and municipal separate storm sewer system (MS4) permittees to support their green infrastructure projects. Several municipalities have identified green stormwater infrastructure projects to meet MS4 requirements.

Increase Funding to the Dirt, Gravel, and Low Volume Road (DGLVR) Program

The Dirt, Gravel, and Low Volume Road program provides funding to municipalities to reduce the environmental impact on Pennsylvania's network of over 20,000 miles of publicly-owned unpaved roadways that send runoff and sediment into our rivers and streams.[66] The program is overseen by the State Conservation Commission and locally administered through the County Conservation Districts. This program is funded at $35 million annually, which provides $28 million to the counties across the state.[67] The remaining $7 million is allocated to DCNR for DGLVR maintenance on state owned lands.

Increasing funding to the DGLVR program would help municipalities, especially in more rural communities, implement stormwater practices and improve water quality. The Phase 3 WIP shows that the annual cost of the DGLVR program reaching counties in the Chesapeake Bay Watershed is $1.7 million. Additional funding, at minimum, of $5 million could be targeted to water quality improvement within the Chesapeake Bay Watershed.

Restore Funding for Act 167 Stormwater Management Planning

The Stormwater Management Act of 1978, known as Act 167, requires counties to adopt a stormwater management plan for each watershed that is to be reviewed and updated, as necessary, every five years. In turn, municipalities adopt ordinances and local

regulations consistent with their county's Act 167 plan. These ordinances help satisfy MS4 permit requirements and provide a framework for communities without a permit to establish local stormwater management programs, all coordinated at the county-level from a local watershed planning framework. Renewal of the Act 167 Program can provide a mechanism to address the roughly 75 percent of developed land within the watershed that is not covered under an MS4 permit.

The Phase 3 WIP identified broad stakeholder interest in revival of the Act 167 program and cross integration with other planning efforts and Phase 3 WIP priorities. The state budget formerly allocated funding for planning activities. To support such local efforts, the Phase 3 WIP calls on the Legislature to restore funding to planning activities.

Establish Requirements for Fertilizer Application

The largest source of nutrients in the stormwater sector comes from grassed areas and lawns in our communities.[68] Several states enforce limits on fertilizer to ensure residents and businesses don't put too much on the ground, because excess runs off into our waterways. Pennsylvania can make significant reductions by implementing new limits.

For the last few years, farming stakeholders and policymakers have negotiated SB 915 (2019-2020 session), which would set the following limits on fertilizer, thereby reducing nitrogen and phosphorus by 105,000 and 4,000 pounds per year, respectively, towards Bay restoration goals.

The legislation would:

- Set limits on application rates, including
  - 0.7 pounds of readily available nitrogen per 1,000 square feet;
  - 0.9 pounds of total nitrogen per 1,000 square feet; and,
  - No phosphorus, except on new or damaged lawns or special application rates allowed for enhanced-efficiency phosphorus fertilizer, natural organic fertilizer or organic-based fertilizer.
- Set standards for labeling requirements.
- Restrict application during the winter or when the ground is frozen.
- Establish a professional applicator training and certification program.
- Create an agricultural and homeowner education program.

Pennsylvania is lagging behind other states in passing fertilizer legislation and the industry would prefer standard requirements across the region and state.[69] The fees and fines in the legislation are expected to bring in around $825,000 annually, which will cover the costs for the Pennsylvania Department of Agriculture to administer this program.[70]

Provide Municipalities the Authority to Enact Stormwater Fees

Developed landscapes play an important role in the health of our rivers and streams. Rain and snowmelt pick up debris and contaminants such as pet waste, oil and grease, pesticides and herbicides, and trash, and carry these pollutants over land or through underground pipes to streams without any treatment. This type of pollution from developed areas is the third leading cause of stream impairment in Pennsylvania.

There are 2,560 municipalities of varying size and governance structure across Pennsylvania. A little less than half of those—or about 1,000 municipalities—have MS4 permits for stormwater.

In Pennsylvania's Chesapeake Bay Watershed, there are over 350 municipalities required to have an MS4 permit. To improve local water quality and water quality reaching the Chesapeake Bay, in 2018 the DEP included a requirement that MS4 permittees reduce sediment pollution coming from the permitted area by 10 percent.

In addition to improving streams, proper stormwater management is also important for local governments to have the appropriate infrastructure and practices in place to reduce street and river flooding. Act 68 of 2013 and Act 123 of 2014 authorized municipalities to establish stormwater utilities and to collect rates for stormwater management. However, establishing an authority could be a burden to a municipality to collect fees. In 2016, Act 62 gave Second Class townships the capacity to collect fees without first setting up an authority.

HB 473 and 474 (2019-2020 session) would amend the Boroughs and Incorporated Towns Code, the Cities Code, and the First-Class Township Code to allow other types of municipalities to have the same advantage as second class townships. The ability to collect stormwater fees dedicated to pay for municipal stormwater programs and projects will allow local governments to meet permit requirements, protect local waterways, and, in some cases, reduce local and street flooding.

Policies to Reduce Nutrient Pollution from Forestry-related Practices

Nutrient reductions from forestry-related practices are based on four cost-effective practices, which are estimated to cost $43 million annually:

- **Forested Riparian Buffers.** The planting of trees and shrubs along streams, with a goal of 83,000 acres in agricultural lands and 2,650 in developed areas. Annual cost: $20.6 million.
- **Tree Canopy.** Planting 15,000 trees (50 acres) in our cities and towns. Annual cost: $4,000.
- **Woods and Pollinator Habitat.** Converting lawns and grassy areas to naturalized woods and meadows. Annual cost: $751,000.
- **Stream and Wetland Restoration.** Repairing, or restoring, 60,000 linear feet per year of streambank erosion and 400 acres of wetland restoration per year. Annual cost: $23.3 million.

Expand funding to DCNR's Riparian Forest Grant Program

Expand DCNR's Riparian Forest Buffer program from $500,000 to $1 million to directly support buffer projects on agricultural land. Additional funding, up to $1 million, should be considered for buffer plantings for municipalities to help meet their stormwater program goals. Currently, these grants require a 50 percent match, which can prevent smaller organizations and local governments from applying. Therefore, grants should be allowed to cover greater than 50 percent of project costs to encourage applicants that otherwise could not apply.

Continue and Expand Pennsylvania Infrastructure Investment Authority (PENNVEST) Multifunctional Buffer Grant Program

Between 2017-2019, PENNVEST, in partnership with DCNR, funded three initial rounds of a multifunctional buffer grant program at $1 million each year. Multifunctional buffers are streamside trees or other vegetation that are selected for their ability to grow commodities, such as fruit, nuts, berries, or woody florals, that can be sold for a value. This statewide grant program was intended to assess if multifunctional buffers can produce enough revenue for a landowner to make enough money to pay back a low interest loan. However, planting a new buffer and finding a marketplace or supply chain for profit can take years to establish and measure its success. Therefore, it is too soon to measure the success of this innovative grant program.

To assist in reaching the riparian buffer goals in the Phase 3 WIP, PENNVEST should continue this program and fund it at $5 million per year. One unique feature of this program was the lack of a match requirement, which allows for a broader group of smaller organizations to apply for these grants without having to find matching funds. Additionally, the Pennsylvania Association of Conservation Districts (PACD) was a major grant awardee, which enabled them to offer the funding to County Conservation Districts. To make this program even more successful, at least half of the grant funding should be eligible to all riparian forested buffers.

Fund TreeVitalize to Meet Tree Canopy Goals

In addition to streamside buffers, the planting of trees in our towns and cities provides several water quality benefits, among them a reduction in stormwater runoff and a reduction in nutrient and sediment pollution.

The Phase 3 WIP identifies a goal of planting 15,000 trees in our cities and towns, referred to as the tree canopy goal. DCNR's TreeVitalize Program offers an annual grant program exclusively for community tree plantings. The TreeVitalize Program can be used to meet the estimated $4,000 in annual cost to meet this goal. An increase in tree canopies in our cities and towns could bring many additional benefits like lower cooling costs, increased property values, and reductions in air pollutants.

Tree planting in Lancaster County, PA

Photo courtesy of Will Parson, Chesapeake Bay Program

Riparian forest buffer, Huntingdon, PA.
Photo courtesy of Will Parson, Chesapeake Bay Program

Provide Dedicated Funding for Clean Water Projects

Across the state and watershed, countless efforts are being undertaken voluntarily to improve local rivers and streams. Currently, many of these practices are funded through the Growing Greener and Keystone Recreation, Park and Conservation Fund. Developing a dedicated fund for restoration projects or increases to the Environmental Stewardship Fund and Keystone Recreation, Park and Conservation Fund would help close the funding gap for this portion of the Phase 3 WIP. The forestry-related practices, including forested buffers, pollinator and wood habitat, and stream restoration, need an additional $33 million in dedicated funding to meet nutrient reduction goals.

Establish a minimum 100-foot Riparian Buffer Requirement

In addition to state funding assistance, the following is a policy recommendation that, if passed, would facilitate additional nutrient reductions.

Riparian forested buffers are streamside trees adjacent to a river or stream. Riparian forested buffers are one of the most cost-effective practices to protect our waterways. They reduce nutrients from reaching the stream, cool the water, and provide a food source and habitat for the organisms and fish living in the water. The Phase 3 WIP identifies riparian forested buffers as one of the top four priority practices that account for 50 percent of the nitrogen reduction. Riparian forested buffers have always played a key role in Pennsylvania's clean water efforts. In the Phase 3 WIP, they account for over 20 percent of the nitrogen reductions.

SB 416 (2017-2018 session) would require a minimum 100 foot riparian buffer on each side of a surface water body and a minimum 300 foot buffer around streams designated as High Quality or Exceptional Value. It further would authorize municipalities to adopt regulations applicable to riparian buffers and provide additional powers and duties to the Pennsylvania Department of Environmental Protection to enforce these regulations and provide penalties for violations. During the 2019-2020 session, Representative Joe Webster issued a Co-Sponsorship Memoranda in September 2019 to introduce a similar bill.

Funding Pilot County Practices

The Phase 3 WIP utilized a tiered approach to develop all 43 county plans, based on prioritizing the plans in the highest nutrient and sediment producing counties. For example, Lancaster and York counties alone account for 25 percent of the total amount of nutrients and sediment that Pennsylvania is required to reduce.

Led by local leaders, each county tailored their County Action Plan (CAP) to meet county-specific goals with local knowledge and resources. To guide each county, a Community Clean Water Toolbox was provided by DEP with local information about factors that impact water quality to inform decision making.

Table 9 shows the estimated annual cost per pilot county plan and the associated reductions in nitrogen and phosphorus. The Phase 3 WIP estimates the total cost of the practices in the four pilot counties at $157.1 million annually:

- **County Pilot Practices.** Implementation of the practices in the first four pilot counties that developed a County Action Plan (CAP): Lancaster, York, Franklin, and Adams. Annual cost: $157 million.

Pilot County	Annual cost of practice implementation (in millions)	Nitrogen reduction (in pounds)	Phosphorus reduction (in pounds)
Lancaster	$107.3	8,658,474	536,266
York	$26.2	3,063,682	68,270
Franklin	$16.5	1,297,683	65,050
Adams	$7.1	847,652	46,807
TOTAL	**$157.1**	**13,867,491**	**716,393**

Table 9. Cost of Pilot County Practices and associated nutrient reductions. [71]

Establish a County Action Plan Implementation Fund

In early 2020, the four pilot counties received funding from DEP to hire a County Coordinator to oversee implementation of each respective CAP and EPA provided funding for implementation of practices. This funding is a huge boost to successful implementation of the CAPs. A County Action Plan Implementation Fund should be established with a dedicated and reliable funding source at $157.1 million annually to provide the counties funding to implement the practices identified in a CAP.

Funding the Remaining Reductions in the Wastewater Sector

The Phase 3 WIP identifies only one remaining recommendation for the wastewater sector. This sector has already invested $1.4 billion in upgrades to improve the quality of water returning to streams. The Phase 3 WIP estimates this remaining action to cost $309,000:

- **Onsite Septic Management.** The development of a tracking and monitoring system for municipalities to report on-lot system operation and maintenance and permitting information. Annual cost: $309,000.

Because of investments early on in the TMDL process to upgrade wastewater treatment plants, this sector has largely met its goals. The Phase 3 WIP identifies the need for DEP to develop a tracking and monitoring system for municipalities to report on-lot system operation and maintenance and permitting information. The estimated cost for this GIS-based online tool is $309,000. This funding should be included in the budget for DEP to complete this action. Municipal onsite septic system inspection and pumping programs is a requirement under the Act 537 Sewage Facilities Planning Act.

Juniata River in Mifflin County, PA.
Photo courtesy of Will Parson, Chesapeake Bay Program

The estimated cost of fully implementing the Phase 3 WIP is $521 annually. State and federal funding can vary year to year creating vast differences in the amount of available funding. The Phase 3 WIP shows state and federal funding ranging from a high of $222 million in FY2017 to a low of $117 million in FY2015, representing a difference of $105 million over a three-year period. Any cuts to current funding will lead to an increase in the funding gap. Conversely, additions in federal funding and other investments, such as those being done by farmers, foundations, homeowners, and businesses, will reduce the amount of funding needed in annual state budgets.

It is important to note that the recommendations in this report include both funding and non-funding policies. While it is difficult to assign a value to the non-funding policy recommendations, the reductions facilitated as a result of changes to policy or municipal authority will reduce how much funding is needed from the state budget. The following policy recommendations, as described in more detail above, would reduce the amount needed in annual state appropriations:

- Update Clean & Green Program
- Provide Municipalities the Authority to Enact Streambank Fencing Requirements
- Restore Funding for Act 167 Stormwater Management Planning
- Establish Requirements for Fertilizer Application
- Provide Municipalities the Authority to Enact Stormwater Fees
- Establish a minimum 100-foot Riparian Buffer Requirement

The passage of these policies will create an environment for private investment and synergies with existing investments that multiply potential pollution reductions and reduce the need for direct state investment. For example, updating the Clean & Green Program would result in increased compliance with already required conservation plans and practices. Providing municipalities with the authority to require streambank fencing for livestock would allow localities to protect local waterways and would encourage private investments to meet local requirements. Likewise, establishing riparian forest buffers for development and redevelopment would shift the costs of stream protections to developers and individuals to improve or protect areas adjacent to streams.

In the stormwater sector, restoring Act 167 funding would cost the state some; however, the Act 167 program provides a framework and pathway to reaching the 70 percent of municipalities outside of permitted areas. Legislation putting limits on fertilizer application will reduce the excess nutrients being washed off and harming our waterways. Providing all forms of municipalities the authority to collect stormwater fees without an authority will allow local governments to raise dedicated funding for stormwater management.

Establish a Dedicated Source of Funding for Clean Water Projects

Put simply, it costs money to clean up pollution and advance clean water goals. Thanks to the National Pollution Discharge Elimination System (NPDES) permitting system, we have a mechanism for "end of pipe" polluters to be responsible for their contribution to degrading our rivers and streams. Much of the pollution coming from industry and other types of facilities have a permit to keep those sources from dumping their waste into streams and rivers. However, much of the pollution that impacts our waterways today is coming from nonpoint source pollution, which is largely unregulated and makes its way into our rivers and streams through overland flow of rain and snowmelt or through groundwater contamination. To clean up this type of pollution, we need to put practices in place that keep the runoff from reaching our streams.

A dedicated source of funding established by the General Assembly will help local governments, farmers, conservation organizations, and others working across the agriculture, stormwater, and forestry-related practices to clean up our waterways and fund the projects necessary to do the job. The Phase 3 WIP specifically calls out "a strong preference for legislation that would create a dedicated and stable funding source for these investments."[72]

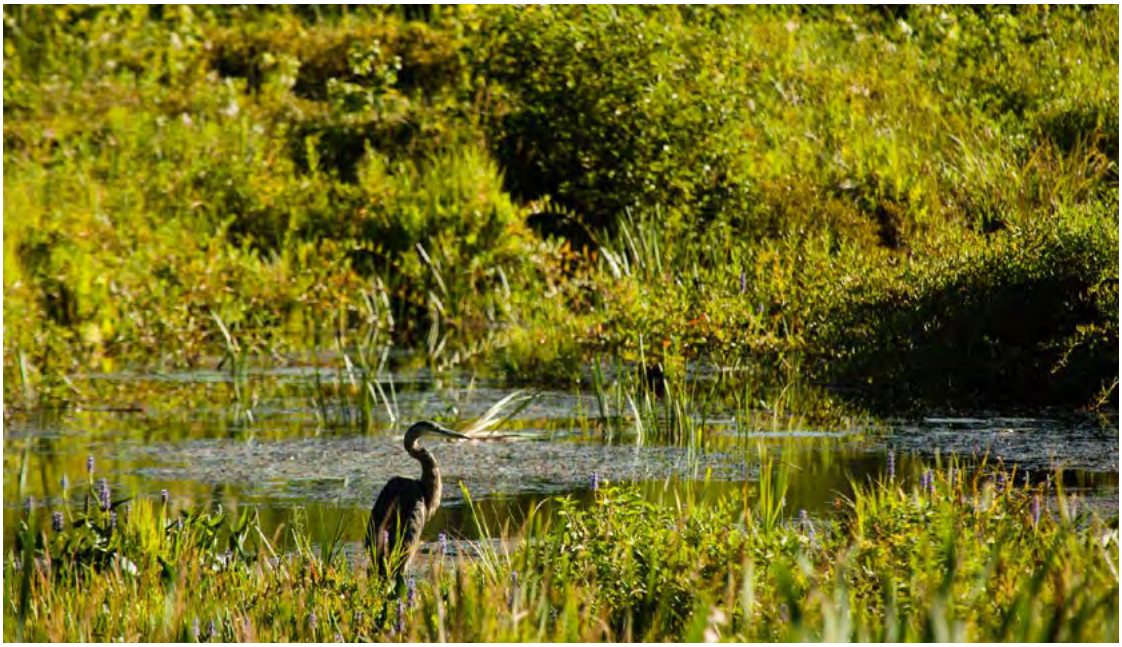
A DEDICATED SOURCE OF FUNDING ESTABLISHED BY THE GENERAL ASSEMBLY WILL HELP LOCAL GOVERNMENTS, FARMERS, CONSERVATION ORGANIZATIONS, AND OTHERS ... TO CLEAN UP OUR WATERWAYS AND FUND THE PROJECTS NECESSARY TO DO THE JOB.

The following section offers ways to raise revenue to improve Pennsylvania's streams and rivers, in no particular order:

Establish a Water Use Fee

A water use fee, such as the one proposed in HB 20 during the 2017-2018 session, would impose a fee on large water withdrawals, over greater than 10,000 gallons per day, for commercial use. HB 20 includes exemptions for agricultural, municipal, community, and non-community water systems, and not-for-profit entities. In 2018, the Legislative Budget and Finance Committee found to generate:

- $2.6 billion in revenues, a fee of $0.0001 per gallon of water withdrawn and returned and $0.001 per gallon of water consumed[73];
- $500 million in revenues, a fee of $0.000018 per gallon of water withdrawn and returned and $0.00018 per gallon of water consumed;
- $300 million in revenues, a fee of $0.000010 per gallon of water withdrawn and returned and $0.00010 per gallon of water consumed; or,
- $100 million in revenues, a fee of $0.0000036 per gallon of water withdrawn and returned and $0.000036 per gallon of water consumed[74].



A great blue heron visits wetlands at Florence Shelly Preserve in Susquehanna County, PA.
Photo courtesy of Will Parson, Chesapeake Bay Program

Eliminate Sales Tax Exemption for Bottled Water

Bottled water is currently exempt from sales tax under Pennsylvania's tax code, even though that tax is levied on other bottled drinks. Eliminating this exemption would help raise significant revenue. Additional revenue could be raised through further eliminating the tax exemption on bottled coffees, juices, and teas.

Reauthorize Growing Greener

In 1999 Governor Tom Ridge signed landmark legislation funding for clean water, parks and trails, green open spaces, and locally grown food. In 2007, the General Assembly renewed investments in this funding, which benefits Pennsylvanians by establishing robust funding for conservation, recreation, preservation, and community revitalization. With these goals in mind, the Governor and the Pennsylvania General Assembly should pass reauthorizing legislation for a Growing Greener III. Recent iterations of Growing Greener III have focused on clean water, especially in the Susquehanna basin. Growing Greener III should include priorities in the following areas:

- Conserving Land and Water Resources;
- Restoring Damaged Waterways and Land; and,
- Creating Prosperous and Sustainable Communities.

Pass Clean Water Infrastructure Legislation

State policymakers have proposed clean water infrastructure legislation in the past, most recently included in Governor Wolf's "Restore Pennsylvania" plan, which called for $4.5 billion in bonding. These funds were proposed to support a wide range of infrastructure projects across the Commonwealth, including significant investments for critical flood control infrastructure, stormwater management best management practices (BMP) projects for municipalities, contaminant remediation, and green infrastructure to help our state's water quality – especially in effort to meet the goals of the Chesapeake Bay cleanup. If passed, Restore Pennsylvania would have provided funding for BMPs that clean up local waters and reduce excess nutrient and sediment runoff to the Chesapeake Bay. While just one example, the framework to use bonding matched with a revenue source to support water infrastructure holds significant opportunity for pollution reduction in the Bay watershed.

Increase the Tipping Fee on Landfills

State lawmakers could amend Title 27 to increase the disposal fee for solid waste disposed of at municipal waste landfills, similar to how previous tipping fee increases were used to support Growing Greener.

Levy a State Fee on Single Use Plastic Bags

Implement a fee on single-use plastic bags to not only disincentivize plastic consumption and reduce litter in our streets and waterways, but also raise revenue for additional environmental programs.

Expand Pennsylvania's P3 Program to Include All State Projects

Public-private partnerships (P3) are an opportunity to bring private dollars into clean water restoration work. There are several types of P3s, such as pay-for-performance, Environmental Impact Bonds, and credit trading programs. In establishing a P3 program, Pennsylvania could leverage state money with private dollars to increase the funding available for clean water BMPs.

Implement the Fair Share Tax Plan

The Fair Share Tax plan would divide Pennsylvania's personal income tax into a separate tax on wages and interest as well as a tax on income from passive wealth (e.g. dividends, capital gains, etc.). The plan would cut the income tax on wages from 3.07 percent to 2.8 percent and sets a new rate of 6.5 percent on income from passive wealth. According to analysis by the Pennsylvania Budget and Policy Center, the proposal would generate at least $2.2 billion in new annual revenue, while cutting or leveling taxes for most in the Commonwealth aside from out-of-state taxpayers and the richest fifth of taxpayers in the state (Pennsylvania Budget and Policy Center, 2019).

Levy a Severance Tax on Fracked Gas Drilling Production

Despite being the second-largest producer of fracked gas in the country, Pennsylvania's lawmakers have refused to implement a severance tax on the industry. Instead, the state uses an Impact Fee, which provides a flat fee per well that phases out over time. By comparison, a severance tax would generate revenue based on the amount of gas produced by the wells. In other words, Pennsylvania's fracked gas industry is paying far less than in other states, particularly as the number of new wells drilled decreases over time. A severance tax could be enacted to support the proposals in this framework.

CONCLUSION

Chickies Rock County Park in Columbia, PA.
Photo courtesy of Steve Droter, Chesapeake Bay Program

This plan, *Underfunded and Polluted: Solutions to Funding Clean Water in Pennsylvania and the Chesapeake Bay Watershed*, provides a legislative pathway forward for policies and funding that can guide Pennsylvania to meet its clean water goals. Pennsylvania has a long road ahead to meet its Chesapeake Bay TMDL reductions of 34 million pounds of nitrogen and 756,000 pounds of phosphorus by the end of 2025, with a cost estimated at $521 million.[75]

This plan provides reasonable and commonsense policies for the state Legislature to address over the next three legislative sessions. With leadership and a sense of stewardship for our water resources, the General Assembly can meet Pennsylvania's clean water goals and uphold its duty to be the trustee of our resources and state constitutional right to clean air, pure water, and the preservation of the environment.

The benefits of investing in and meeting Pennsylvania's clean water goals will have real results here in the Commonwealth. The calculated economic benefits to Pennsylvania for meeting its pollution reduction goals could exceed $6.2 billion annually. Healthy rivers and streams impact us and our communities in many ways: improved drinking water sources, reductions in treatment costs, increases in revenues from recreational activities, jobs created or sustained by the labor and work that goes into installing clean water practices, more access to open spaces, and so much more.

FOOTNOTES

[1] An additional $16 million would be leveraged in match by local governments.

[2] Proposed is an additional increase from current funding levels.

[3] An additional $2.5 million would be leveraged in matching funds from grantees.

[4] Proposed funding is an additional increase from current funding levels.

[5] Includes funding from all possible sources and the creation of a County State Revolving Loan Funds.

[6] DEP's Annual Budget

[7] Often focus is placed on achieving the only funding gap from current funding levels which are an average of $196 million between FY14 and FY19. This report takes a comprehensive look at achieving 100 percent of the estimated cost. The state's contribution could be reduced by federal and private spending as well as non-funding policies that could lead to additional reductions without tapping as deeply into the state's coffers.

[8] Pennsylvania Department of Environmental Protection. Chesapeake Bay Watershed. Retrieved from https://www.dep.pa.gov/Business/Water/Pennsylvania%E2%80%99s%20Chesapeake%20Bay%20Program%20Office/Pages/default.aspx

[9] Pennsylvania Department of Environmental Protection. 2020. Streams and Lakes in Category 5 from draft 2020 Pennsylvania Integrated Water Quality Monitoring and Assessment Report. Retrieved from https://www.depgis.state.pa.us/2020_Integrated_Report/.

[10] Pennsylvania Department of Environmental Protection. 2018 Pennsylvania Integrated Water Quality Monitoring and Assessment Report. Retrieved from https://www.depgis.state.pa.us/2018_integrated_report/index.html

[11] Pennsylvania Department of Environmental Protection. August 2019. Pennsylvania Phase 3 Chesapeake Bay Watershed Implementation Plan. Retrieved from https://files.dep.state.pa.us/Water/ChesapeakeBayOffice/WIPIII/FinalPlan/PA_Phase_3_WIP_Final.pdf

[12] Chesapeake Bay Program. December 1983. The Chesapeake Bay Agreement of 1983. Retrieved from https://www.chesapeakebay.net/documents/1983_CB_Agreement2.pdf

[13] The Chesapeake Bay Commission is the legislative partner and liaison to the U.S. Congress on policy and budgetary matters related to the restoration of the Bay and its watershed. It is comprised of 21 members: 5 state legislators each from Pennsylvania, Maryland, and Virginia, as well as the cabinet secretaries from the 3 states' natural resource agencies, and three citizen representatives.

[14] United States Environmental Protection Agency. December 2010. The Chesapeake Bay TMDL. Available at https://www.epa.gov/chesapeake-bay-tmdl/chesapeake-bay-tmdl-document

[15] Chesapeake Bay Program. June 2014. Chesapeake Watershed Agreement. Retrieved from https://www.chesapeakebay.net/documents/FINAL_Ches_Bay_Watershed_Agreement.withsignatures-HIres.pdf

[16] Backstop actions EPA could take include: more farms and municipalities help to permit requirements, additional requirements from existing permit holders, federally established water quality standards unique to each watershed, and/ or withhold or redirect federal grant dollars.

[17] Pennsylvania Department of Environmental Protection. August 2019. Pennsylvania Phase 3 Chesapeake Bay Watershed Implementation Plan. Retrieved from http://files.dep.state.pa.us/Water/ChesapeakeBayOffice/WIPIII/FinalPlan/PA_Phase_3_WIP_Final.pdf

[18] Pennsylvania Department of Environmental Protection. January 21, 2016. A DEP Strategy to Enhance Pennsylvania's Chesapeake Bay Restoration Effort. Available at http://files.dep.state.pa.us/Water/ChesapeakeBayOffice/DEP%20Chesapeake%20Bay%20Restoration%20Strategy%20012116.pdf

[19] Investments by individuals, private investors, or local funding is not reported, and therefore, not included in funding totals.

[20] Pennsylvania Department of Environmental Protection. August 2019. Pennsylvania Phase 3 Chesapeake Bay Watershed Implementation Plan. Retrieved from https://files.dep.state.pa.us/Water/ChesapeakeBayOffice/WIPIII/FinalPlan/PA_Phase_3_WIP_Final.pdf

[21] U.S. Environmental Protection Agency. July 2020. Evaluation of Pennsylvania's 2018-2019 and 2020-2021 Milestones. Available at: https://www.epa.gov/sites/production/files/2020-07/documents/pa_2018_2019_2020_2021_final_milestone_evaluation.pdf

[22] Pennsylvania Department of Environmental Protection. August 2019. Pennsylvania Phase 3 Chesapeake Bay Watershed Implementation Plan. Retrieved from http://files.dep.state.pa.us/Water/ChesapeakeBayOffice/WIPIII/FinalPlan/PA_Phase_3_WIP_Final.pdf

[23] Pennsylvania Department of Environmental Protection. August 2019. Pennsylvania Phase 3 Chesapeake Bay Watershed Implementation Plan. Retrieved from https://files.dep.state.pa.us/Water/ChesapeakeBayOffice/WIPIII/FinalPlan/PA_Phase_3_WIP_Final.pdf

[24] Approximately, 350 municipalities in the Chesapeake Bay Watershed meet the requirements to be covered under an MS4 permit.

[25] United States Environmental Protection Agency. June 2018. U.S. Environmental Protection Agency's Expectations for the Phase III Watershed Implementation Plans. Retrieved from https://www.chesapeakebay.net/documents/EPA_Phase_III_WIP_Expectations.pdf

[26] This amount accounts for only state and federal funding sources. It does not capture other private funding sources, such as individual, foundation, or municipal.

[27] This includes funding that is a combination of federal and state, including the Chesapeake Bay Program and PENNVEST stormwater funding.

[28] Pennsylvania Department of Environmental Protection. August 2019. Pennsylvania Phase 3 Chesapeake Bay Watershed Implementation Plan. Retrieved from http://files.dep.state.pa.us/Water/ChesapeakeBayOffice/WIPIII/FinalPlan/PA_Phase_3_WIP_Final.pdf

[29] Pennsylvania Department of Environmental Protection. August 2019. Pennsylvania Phase 3 Chesapeake Bay Watershed Implementation Plan. Retrieved from http://files.dep.state.pa.us/Water/ChesapeakeBayOffice/WIPIII/FinalPlan/PA_Phase_3_WIP_Final.pdf

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[31] Chesapeake Bay Commission. 2015. Healthy Livestock, Healthy Streams: Policy Actions To Promote Livestock Stream Exclusion. Quote on page 12. Available at: https://www.chesbay.us/library/public/documents/Policy-Reports/Healthy-Livestock-Healthy-Streams.pdf

[32] Delaware Valley Regional Planning Commission and Green Space Alliance. 2011. Return on Environment: The Economic Value of Protected Open Space in Southeastern Pennsylvania. Available at: https://www.dvrpc.org/openspace/value/pdf/ReturnOnEnvironment-TheEconomicValueOfProtectedOpenSpaceInSoutheasternPA-SummaryReport.pdf

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[34] Theodore Roosevelt Conservation Partnership. 2018. The Power of Outdoor Recreation Spending in Pennsylvania: How hunting, fishing, and outdoor activities help support a healthy state economy. Available at: http://www.trcp.org/wp-content/uploads/2018/12/TRCP-and-Southwick-PA-Economic-Analysis-12-6-18.pdf

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[36] Susquehanna River Basin Commission. 2013. State of the Susquehanna 2013 Report. Available at: https://www.srbc.net/our-work/reports-library/technical-reports/state-of-susquehanna-2013/docs/state-of-susquehanna.pdf

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[39] U.S. Environmental Protection Agency. The Economic Benefits of Green Infrastructure: A Case Study of Lancaster, PA. Available at: https://www.epa.gov/sites/production/files/2015-10/documents/cnt-lancaster-report-508_1.pdf

[40] Pennsylvania Department of Environmental Protection. August 2019. Pennsylvania Phase 3 Chesapeake Bay Watershed Implementation Plan. Retrieved from https://files.dep.state.pa.us/Water/ChesapeakeBayOffice/WIPIII/FinalPlan/PA_Phase_3_WIP_Final.pdf

[41] Capacasa, Jon M. December 30, 2016. U.S. Environmental Protection Agency letter to PA Department of Environmental Protection. Available at https://www.google.com/url?q=https://drive.google.com/file/d/0B4Y3VQLxjkxObjZoZXlSVDZvRWc/view&sa=D&ust=1596812637549000&usg=AFQjCNHW22TQvA282661mOP6e-wafb7jbQ

[42] The State Conservation Commission contributes an additional 7 Conservation Program Specialists staff members that work in the agricultural sector, which is funded at $728,000. They carry out Nutrient and Odor Management (Act 38) oversight. Furthermore, the Pennsylvania State University has 5 Penn State Extension employees that Nutrient Management Support (Act 38). The Phase 3 WIP does not recommend additional staff needed for these entities.

[43] Pennsylvania Department of Environmental Protection. August 2019. Pennsylvania Phase 3 Chesapeake Bay Watershed Implementation Plan. Retrieved from https://files.dep.state.pa.us/Water/ChesapeakeBayOffice/WIPIII/FinalPlan/PA_Phase_3_WIP_Final.pdf

[44] Pennsylvania Park and Forest Foundation. 2018. The Legacy of Pennsylvania's State Parks and Forests: The Future Is In Our Hands. Retrieved at https://protectourparksandforests.org/wp-content/uploads/2020/05/final-report.pdf

[45] The Phase 3 WIP has identified the Pennsylvania Fish & Boat Commission as needing 8 new staff members to carry out the restoration work under the forestry-related practices.

[46] Pennsylvania Department of Environmental Protection. August 2019. Pennsylvania Phase 3 Chesapeake Bay Watershed Implementation Plan. Retrieved from http://files.dep.state.pa.us/Water/ChesapeakeBayOffice/WIPIII/FinalPlan/PA_Phase_3_WIP_Final.pdf

[47] Pennsylvania Department of Environmental Protection. August 2019. Pennsylvania Phase 3 Chesapeake Bay Watershed Implementation Plan. Retrieved from http://files.dep.state.pa.us/Water/ChesapeakeBayOffice/WIPIII/FinalPlan/PA_Phase_3_WIP_Final.pdf

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[62] PennState Extension. Stream Bank Fencing: Green Banks, Clean Streams. Available at https://extension.psu.edu/programs/nutrient-management/educational/best-management-practices/stream-bank-fencing-green-banks-clean-streams

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[64] At least, $16 million should go towards projects in the Chesapeake Bay Watershed.

[65] Other states, including New York, Massachusetts, and New Jersey provide much broader state grant programs for green infrastructure, in addition to traditional methods of financing water projects.

[66] Pennsylvania State University, Center for Dirt and Gravel Road Studies. Available at session https://www.dirtandgravel.psu.edu/

[67] Of the 28 million, $8 million is allocated to low volume roads and the remaining goes to dirt and gravel roads. Paved or sealed roads with traffic counts less than 500 cars per day qualify as a low volume road.

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