

RYAN A. BIZZARRO, CHAIRMAN

414 MAIN CAPITOL BUILDING
P.O. BOX 202003
HARRISBURG, PENNSYLVANIA 17120-2003
(717) 772-2297
FAX: (717) 780-4767



HOUSE DEMOCRATIC POLICY COMMITTEE

WEBSITE: WWW.PAHOUSE.COM/POLICYCOMMITTEE

EMAIL: POLICY@PAHOUSE.NET

[Twitter](#) [Facebook](#) [Instagram](#) @PADEMPOLICY

HOUSE OF REPRESENTATIVES

COMMONWEALTH *of* PENNSYLVANIA

House Democratic Policy Committee Hearing

Stormwater Management and Infrastructure Impact

Monday, October 3, 2022 | 1 p.m. – 3 p.m.

Representative Joe Webster

PANEL ONE

1 p.m.

Betsy Daley, Upper Providence Twp. resident

Crystal Gilchrist, Engineer

Cathy Kernen, Collegeville Council President & Chair

Collegeville Economic Development Council

Q & A with Legislators

PANEL TWO

1:30 p.m.

Erin McCool, Lower Providence EAC Chair

Drew Shaw, AICP, Environmental Planning Manager

Montgomery County Planning Commission

Q & A with Legislators

PANEL THREE

2 p.m.

Dr. Robyn Hannigan, President

Ursinus College

Kate Keppen, Director of Sustainability

Ursinus College

Q & A with Legislators

PANEL FOUR

2:30 p.m.

Robert Pace, Master Watershed Steward

Penn State Extension

Q & A with Legislators

RYAN A. BIZZARRO, CHAIRMAN

414 MAIN CAPITOL BUILDING
P.O. BOX 202003
HARRISBURG, PENNSYLVANIA 17120-2003
(717) 772-2297
FAX: (717) 780-4767



HOUSE DEMOCRATIC POLICY COMMITTEE

WEBSITE: WWW.PAHOUSE.COM/POLICYCOMMITTEE

EMAIL: POLICY@PAHOUSE.NET

   @PADEMPOLICY

HOUSE OF REPRESENTATIVES
COMMONWEALTH *of* PENNSYLVANIA

Betsy Daley Testimony

House Democratic Policy Committee Meeting
Upper Providence Township Municipal Building
Monday, October 3, 2022, 1:00 PM

Hello, my name is Betsy Daley, a long-time resident of Upper Providence Township, MC, having moved to Port Providence in 1980 just as Rt 422 was being built westward from Oaks, PA. In the 42+ years my family has lived in Upper Providence Township, there has been a great deal of change initiated by the expansion of Rt 422. What was once primarily an agricultural community changed to a highly desirable area for families to live, work and play. Developers and builders were attracted to its open spaces to build homes, office complexes and retail centers due to the easy access to Rt. 422 leading east and west to known commerce centers: King of Prussia and Reading.

When we moved here from Narberth after our return from military service in CA, we thought we were moving to the “country”. Port Providence is a little village alongside the historic Schuylkill Canal with an abundance of natural land between the canal and Schuylkill River. At that time it was quiet, peaceful and affordable as we started out anew. We raised our three children here. They learned how to fish, boat, and ice skate on the canal that was a big part of their lives growing up in Port. Most of all, we all learned to respect the power of water and how at times it could be so much fun but how destructive and dangerous it could be during the many flooding events that occurred over the years.

Fortunately, our home is situated at the highest point on our street, Canal St, and during these events we would watch and wait as water receded sometimes within hours, other times over a week’s time. Every time there was a flood event it was devastating; emotionally and physically. No matter whether you had water in your home or not – everyone was affected by the trauma and loss. In 1999, when TS Floyd hit, we did experience a basement full of toxic flood water in our home.

Last August 2021, Hurricane Ida barreled inland from the Gulf Coast spewing destruction in its path eventually hitting SE PA with torrential rainfall. This caused catastrophic flooding in various towns and villages along the Schuylkill River and the Perkiomen Creek in Montgomery County. Port Providence and the low laying areas of Mont Clare experienced destructive flooding. The area was also inundated by flood waters from the French Creek and the Pickering Creek Reservoir that was in imminent danger of breaching. We experienced for the first-time flooding on our first floor; we had 4 feet of extremely muddy, oily flood water in our home. The toxic nature of the flood waters and loss of clean water and electricity made our home uninhabitable.

Upper Providence Township responded immediately without question, every department of stepped in to help all the areas affected by the flooding. Multiple municipalities surrounding UPT, including our adjoining neighbor, Phoenixville, rallied to help those affected by the flooding with resources. I can’t say enough how thankful we were for all the support received and there was no loss of life.

This has been the most traumatic thing we have dealt with in our lives. You look around at your flood ravaged home and tear-up; thinking of the memories made there over the years. Furniture, dishes, even walls can all be replaced, we are back in our home with all of that again. But what Ida took from us the most was the security of not being in harm’s way in our own home again. Every time there is a major storm, such as Hurricane Ian currently leaving a path of destruction behind in the south, there is a little bit of storm PTSD.

Experts said IDA was a 500-year flood event, chances of this happening again are questionable. Hurricane Ian is now being labeled a 500-year flood event; it is happening again! The severity of storms is increasing each year as climate change and its affect upon our environment takes hold. The potential loss of life and property has a huge toll on the communities that are in the direct path of these monster storm events.

What I have observed in recent years more so is the increase of flood events caused by stormwater runoff from development. Increased development and the lack of appropriate and timely infrastructure improvements needed to accommodate increased stormwater discharge due to the loss of pervious surfaces is a major factor in these flooding events. Local creeks and streams are being overburdened causing the stormwater runoff to overflow banks leaving destruction along the way. Eventually the water has no place else to go but to the low laying areas, flooding those areas within the township. This is not exclusive to UPT either, many municipalities deal with this during every severe storm.

There are many concerns related to increased stormwater runoff caused by moderate to extreme storms. Environmentally they impact the water quality of our creeks, streams and rivers. It effects the natural lands and wildlife along those corridors that depend on clean water. It has impacts upon the natural aquifers that supply water to wellheads, reservoirs and private wells; all the homes in Port depend on private wells for clean water.

In addition, my husband, Dan, and I are very concerned about flooding and stormwater runoff that impacts the Schuylkill Canal Park area, a 60-acre greenway located in UPT along the Schuylkill River, owned by Montgomery County. Both of us have been actively involved in the Schuylkill Canal Association (SCA), the stewards of the canal and park area, for close to 40 years. The canal is a maintained waterway that originally was a part of the historic Schuylkill Navigation system that transported goods from Schuylkill County to Philadelphia actively from 1825 to 1875. It was the main transportation route, similar to today's Rt. 422, creating economic development in the river towns along its 108-mile length as it provided the coal that fueled the Industrial Revolution during the 19th century.

Today what remains of the Oakes Reach of the Schuylkill Navigation in UPT flows through the villages of Mont Clare and Port Providence. Lock 60 on the Schuylkill Canal is at its head in Mont Clare that contains a restored lock, locktender's house and the various water control mechanisms recreating a fully operational 19th century canal waterway. The towpath once used by mules towing the canal boats is part of the present-day Schuylkill River Trail used by visitors of all walks of life - walking, biking, commuting to and from work, etc. It is a well-used recreational resource that boaters, fisherman and outdoor enthusiasts enjoy all year long. It attracts over 100,000 visitors a year who generate economic benefits for the local surrounding communities.

Flooding and stormwater runoff all have a devastating impact on this valuable historic, cultural and recreational resource. There are multiple outfalls that empty into the canal from storm drains along the entire 2.5-mile length causing erosion weakening its banks and creating the potential for failure that will have a catastrophic affect. Ultimately this costs Montgomery County taxpayers hundreds of thousands of dollars to repair and has a direct affect upon the local economy when these extreme events occur.

Thank you for the opportunity to share with you my point of view.

Betsy Daley
257 Canal St
Port Providence, PA 19460
eliz.b.daley@gmail.com
610-442-0545

October 3, 2022

Stormwater Hearing Testimony
Crystal Gilchrist AICP Ret.
Perkiomen Stormwater Initiative

Good afternoon and thank you for taking up the subject of flooding in our communities. I have been a planner in the region for more than 30 years. I have worked for municipalities, counties, private engineering firms, and I was the executive director of the Perkiomen Watershed Conservancy in the early 2000's through the housing collapse and Hurricanes Irene and Ira. I have watched as time after time, public infrastructure, roads and bridges, municipal water and sewer treatment facilities, homes, and businesses in the hearts of our historic communities have been washed away. As a planner, an environmentalist, and a retired resident of the Perkiomen Creek watershed, I knew I had to get involved with more than just another flood clean-up effort. So I started the Perkiomen Stormwater Initiative in an effort to turn this tide of stormwater that regularly inundates our lives.

You have heard about the impacts of flooding from municipal officials and property owners, and you have all seen how nearly every community suffers when the flood waters come. During Hurricane Ida, the USGS gauge at Graterford in Perkiomen Twp. maxed out at 70,000 cubic feet per second. A simple calculation shows that 70,000 cfs equates to 7,200,000 pounds of water, or 3,600 tons of water passing that gauge every second. That's nearly 13 million tons an hour. No community can withstand that type of impact once the flood waters rise. There is no single, local solution that can address flooding of that magnitude once it commences. So, what is to be done to address flooding? I would like to take a little broader look at the subject than just what happens once the rains begin.

Global Overview:

First, we know that the climate is changing, and scientists tell us that, in our region, we can expect weather that is more erratic, with longer periods without rain, and then, torrential storms on a regular basis. Storms like Hurricane Ida will hit us periodically and hard.

Second, we know that in Pennsylvania, with its 85,000 miles of streams, (more than any state but Alaska) that many of our historic communities that grew along those streams and rivers will be in jeopardy at some point in the future.

Third, the Perkiomen Creek is the largest watershed within the Schuylkill River basin. It provides source water (drinking water) to residents and businesses throughout the region, both via Aqua PA's Green Lane reservoir and through the hundreds of wells, public and private, that serve most of us. Uncontrolled stormwater washing too quickly into the largest rivers, here and

throughout the state, shortchanges the recharge of our groundwater, taxing many water systems and personal wells.

So, the actions that we are talking about here in the Perkiomen watershed, could serve as an example to all of PA's communities on how to begin addressing the anticipated mega-storms.

Impacts to PA and locally

So, let's talk about stormwater before the flooding begins. Our general opinions of stormwater are that it is a bad thing. And left uncontrolled, it is indeed, damaging. But the flip side of the stormwater coin is that it is the rain that falls all around us that recharges our wells and the water supplies we all rely on – when we give it time to soak into the ground.

But too much stormwater does not soak into the ground where it lands and the rain that falls in Berks, Lehigh, Bucks, and western Montgomery counties is the same water that eventually floods the communities in the lower reaches of the Perkiomen as well as its major tributaries. There are many reasons why stormwater is not well-controlled, and we are all familiar with how our development patterns over the last 300 years or so, have changed the natural water cycle.

Actions Needed

I would like to suggest three things that we could do to start turning this stormwater battleship to help protect ourselves from the coming storms while we support our groundwater supplies.

#1: Currently, different activities related to water resources are handled in different departments at PA DEP. Specifically, the MS4 (Municipal Separate Storm Sewer System) regulations currently review municipal actions within each municipal boundary. Water does not flow according to municipal boundaries and municipalities need to be able to work together to address stormwater before it becomes floodwater. Currently, a downstream municipality would not be credited with upstream flood control efforts in a neighboring municipality, even though it may be critical to controlling flooding downstream. This greatly limits what a community can do, or is willing to do, to address flooding. Similarly, watersheds should be contained within a single DEP river basin commission. Currently parts of the Perkiomen watershed lie in the Upper Delaware, Lower Delaware, and Susquehanna River basins due to its four-county size. Better integration within the state agencies would be helpful.

#2: The metrics we use to measure stormwater and run-off are outdated. We regularly get larger storms than would be anticipated, and the controlling regulations are not sufficient to address the new climate conditions we are facing. We need to update FEMA maps and the regulations that give municipalities the ability to require more stormwater controls. Every community needs some level of ongoing development to stay vital, but no community wants to

see its investments washed away on a regular basis. We must give communities the tools to help protect themselves.

#3. Funding – yes funding! We need to fund comprehensive stormwater studies on a watershed basis under an adapted Act 167 format that allows a more focused approach than the traditional Act 167 plans would allow. These studies are large and expensive but you cannot address a problem that you don't understand. You wouldn't keep patching the wet ceiling in your bedroom without figuring out how the water got through the roof and attic. And once we have determined what will mitigate flooding, we need to fund those projects as quickly as possible, in as many places as possible, to return to as natural a water cycle as possible, both to reduce flooding and to protect water supplies.

Overall, we need a new frame of reference when we talk stormwater. A new approach to addressing stormwater requires that we treat stormwater like the valuable resource it is rather than a waste product to be disposed of as fast as possible. If we can better understand where stormwater is generated, and what techniques are best to reduce stormwater run-off, we can better protect the historic investments in our communities and guide future development that does not exacerbate already difficult stormwater conditions.

ALREADY THE NATIONAL ATTENTION HAS SHIFTED TO MORE RECENT DEVASTATING STORMS. KENTUCKY, FLORIDA AND THE CAROLINAS.

THE CONSTANT USURPING OF THE IMAGES OF EACH STORM BY NEW DEVASTATING IMAGES CANNOT DIVERT US FROM THE TASK AT HAND. IN ORDER TO FIND SOLUTIONS, WE MUST UNDERSTAND THE PROBLEM.

STUDIES REQUIRE MONEY AND COMMITMENT.

SOLUTIONS REQUIRE MONEY AND PATIENCE.

TIME IS NOT ON OUR SIDE.

A Creek Flows Through It: A Report on Collegeville Borough's Stormwater Challenges

**Cathy Kernen, President, Collegeville Borough Council
October 3, 2022**

In the state of Pennsylvania, we are fortunate to have more miles of streams to enjoy than any other state in the U.S. except Alaska. However, with climate change and continual development in the boroughs and townships upstream from us, this natural abundance of beautiful moving water is increasingly presenting danger to Collegeville residents living nearby.

The Perkiomen Creek, which flows through Collegeville Borough, is fed from a 362-square mile sub basin above Green Lane. Headwaters originating from four different counties all eventually discharge their waters into our creek and its tributaries, which is part of the Schuylkill River basin. Major tributaries include the 60.9-square mile East Branch, the 55.8-square mile Skippack Creek, the 55.4-square mile Swamp Creek, and the 48.8- square mile Unami Creek watershed

With this extensive headwater system, excessive rainfall can quickly cause massive flooding to downstream towns.

More and More Land Within the Watershed is Becoming Covered with Impervious Surfaces. Businesses Erecting Flood Barriers Contribute to the Problem.

In many of the Perkiomen Watershed's towns and boroughs, the percent of developed area is increasing rapidly as farms are converted into single family and townhouse subdivisions. The continual covering of permeable ground and reduction of natural cover exacerbates the flooding. With soil limited to provide water drainage, each year more runoff flows directly into the streams leading to the Perkiomen Creek.

Also, as businesses continue to build in the flood plain, they implement "solutions" to keep their buildings dry. One example is the building the very large flood wall at Providence Place Senior Living in Lower Providence Township. This structure, which is meant to keep water out of this facility, just pushes the water somewhere else—in this case across the creek toward Keyser-Miller Ford and to nearby properties in Collegeville

The Devastation of the Hurricane Ida Flood on Collegeville Residents

The flooding from the aftermath of Hurricane Ida last year set a new record for monumental flooding on the Perkiomen Creek. The normal flood level is 11 feet; the creek's flood gauge measures up to about 22 feet. We estimated that the creek crested at about 27 feet. The flooding destroyed over 20 borough homes. It also inundated our Main Street from First to Second Avenues, flooded out six businesses, knocked out traffic signal lights and caused water damage to resident basements in other areas of the Borough.

Collegeville Borough has submitted a \$7.6 million grant request to FEMA for buyouts of our flooded residential properties. Those applications are now in front of FEMA for review; we hope to get approval by October, and to go to settlement to pay the homeowners by the end of the year. Although we are very grateful to FEMA and PEMA for the buyouts on behalf of our residents, the grant submission process itself is both stressful and time consuming. We have had to pay \$10,000 upfront in appraisals and \$10,000 for consultants, but hopefully this money will be recouped with the grants. We are also thankful to have received \$62,733.00 in disaster recovery money, which covers 90 percent of our costs for submerged traffic panels and damaged street lights.

Our Flood Victims Experience Trauma

The majority of our residents flooded out of their homes are retired senior citizens, disabled individuals and those with very limited income for other reasons. These residents own or rent homes in a flood plain because it was their most affordable housing option.

Often, individuals surviving disasters experience PTSD. With everything they owned destroyed literally overnight, our flood victims camped out in tents or campers, moved in with relatives, or took advantage of the county providing temporary housing in nearby hotels. Members of one especially traumatized family stationed themselves at the entrance of the Redner's Shopping Center and begged for donations. For the majority of affected residents, every time it rains they worry that their lives and possessions will once again be in danger.

Flood Debris Has Polluted Collegeville's Environment

Parts of houses, household items, and debris from businesses, such as used tires and even entire dumpsters with their contents were deposited by the flood into the Central Perkiomen Park owned by the county. This park acts as a large wetlands, filtering runoff before it gets to the creek. Although the borough, Perkiomen Watershed, Collegeville Rotary and other groups have donated their time and sweat equity on clean ups, and the county has also done a good job, we can never remove all the flood debris. This debris is an eyesore for residents living near the park and to families using the park.

Repeated Flooding of our Historic Buildings Has Affected Their Long-Term Value

The Power House, which was built in 1895 as the Schuylkill Valley Tractionco to generate electrical power for Collegeville was flooded with eight feet of water by Ida and needed extensive cleaning and repair. The Perkiomen Bridge Hotel, which dates back to the early 1700s, was extensively damaged throughout the entire first floor. All the first-floor floors have been destroyed by repeated flooding, and all the sections built after the original structure must now be demolished and removed. Miraculously, the original stone structures of both the hotel and Perkiomen Bridge, which dates back to 1799, still stand and are structurally sound. But the hotel is now determined to have no commercial value. Future uses will be limited to preserving it as a historic structure with temporary uses in the summer.

Doing Nothing is Not an Option

Global warming is now producing new severe weather patterns. We are seeing more cycles of drought followed by torrential rains deluging our communities. Climate Change and the Majority of Impervious Surfaces Are Not Going Away. Ida was a wake-up call that we must heed.

The following are suggested actions which would help our borough, our residents and our businesses deal with our stormwater runoff and persistent flooding:

1. Conduct an ongoing education campaign so that residents and businesses understand the danger of building and living in our expanding flood plain.
2. Find creative ways to help residents and businesses currently located in flood zones to move out of these high-risk locations. The FEMA buy-out plan is a great option for residences. Could the state provide incentives to help businesses relocate outside of flood plains? Without financial help, for many moving may not be an option.
3. Engage in proactive planning and zoning on the regional and local level to discourage, reduce and eventually eliminate M&I and non-recreational Commercial Zoning along the Perkiomen Creek.
4. We cannot solve these problems alone. We need to work together on solutions with Montco Regional Planning and the townships and boroughs upstream from us to try to mitigate and reduce the current large amount of water runoff into the creek.
5. Finally, water is an extremely precious resource. In Collegeville, our drinking water comes from our groundwater. The intermittent flooding of the Perkiomen Creek carries away our valued water. We need state funding to work on solutions, such as demonstration projects to capture rainwater and to reduce runoff into the Perkiomen and other creeks in the county. My colleague, Crystal Gilchrist outlines well thought out suggestions in her written testimony which Collegeville Borough wholeheartedly endorses.

In closing, thank you for inviting Collegeville Borough to testify on this important issue!

Erin McCool

Environmental Literacy Connections

5008 Coldspring Drive Collegeville, PA 19426

484-250-1609

Emdelong509@gmail.com

September 26th, 2022

House Democratic Policy Committee

Ryan A. Bizzarro, Chairman

PA House of Representatives

414 Main Capitol Building

Harrisburg, Pennsylvania 17120

Dear Representatives,

Thank you for the opportunity to provide testimony regarding stormwater and infrastructure impacts in our region.

I live and work in Montgomery County and have seen first-hand how the effects of climate change in Southeastern Pennsylvania have resulted in dramatic stormwater and infrastructure issues. The toll that natural disasters have on individuals and families in our region can be mitigated by building capacity for high quality environmental education that builds environmental literacy and prepares our communities to become more resilient in the face of continued pressure in the coming years. In my testimony, I will highlight the importance of building environmental literacy through support of environmental organizations and public schools in building a community well positioned to recover from extreme weather events and thrive in the face of changing and complex environmental conditions.

Sincerely,

Erin McCool

Principal, Environmental Literacy Connections

E. McCool
Stormwater/Infrastructure Testimony October 2022

Good afternoon, Chair Bizzarro, to our host, State Representative Joe Webster, and to the other members of the committee. Thank you for the opportunity today to speak about stormwater, flooding, and infrastructure in our region.

My name is Erin McCool, I am an environmental education leader with more than 20 years of experience working in environmental and sustainability education. After working in the non-profit sector for 24 years, I have recently launched Environmental Literacy Connections, a company serving schools, NGOs and community-based organizations to increase capacity for environmental and sustainability education. I also serve as a Steering Committee Member for the Statewide Environmental Literacy Steering Committee. Lastly, I am the current Board Chair of the Lower Providence Environmental Advisory Council, a municipality that has experienced significant impacts from stormwater events in the last few years. Through my testimony today, I will share with you the impacts that we have seen in our region and offer the perspective of how investments and support for programs that build environmental literacy, both in school and out of school will advance our collective resilience to future environmental challenges.

I live and work in Montgomery County and have seen first-hand how the effects of climate change in Southeastern Pennsylvania have resulted in dramatic stormwater and infrastructure issues. The toll that natural disasters have on individuals and families in our region can be mitigated by building capacity for high quality environmental education that builds environmental literacy and prepares our communities to become more resilient in the face of continued pressure in the coming years. Individuals and communities who are environmentally literate understand how natural systems work and intersect with human systems. Environmentally literate communities are better equipped to make informed decisions and thrive in the face of complex environmental challenges. According to the National Oceanic and Atmospheric Agency (NOAA): “Resilient communities can make informed decisions that reduce their vulnerability to environmental hazards and stresses that emerge over time. They can withstand these hazards and stresses with minimal damage to their social well-being, economy, and the environment.”

Montgomery County is home to at least 17 named watersheds, which ultimately fall into the Delaware River Basin. In this county alone, there are 22 public school districts and more than 170 individual schools, all of which are within a few miles of one of the 17 streams and tributaries that exist within our county borders. Every person in our region lives, works or attends school within a few miles of a creek or stream. Across the Commonwealth, every Pennsylvanian lives in a watershed that ultimately connects them to people living hundreds of miles away. One of the challenges of managing watershed health is that these intricate natural systems do not line up with political boundaries, so we are connected with those who live up and downstream from us, represented by different leaders, municipalities, counties and states. Any policy solutions to stormwater and infrastructure must take this into account and collaboration across human-constructed boundaries is critical.

The impacts of climate change in our region are manifesting in the form of increased frequency and intensity of heavy precipitation events, resulting in increased stormwater flowing into our waterways and overwhelming our infrastructure. In recent years, this means roads, access to emergency services, power and public schools were all impacted by extreme stormwater. Many

businesses were forced to close temporarily, further stressing their ability to serve the community. In the years 2019, 2020 and 2021, people in our region have been impacted by record-breaking flood events. In 2021, Hurricane Ida dumped more than a month's worth of rain into the Perkiomen in one night. The Perkiomen Creek spans 37 miles, most of which is in Montgomery County and has experienced historic flooding every year for the past three years. On a normal day, the creek in many spots is less than knee deep but during Hurricane Ida, it rose to over 26 feet, more than 10 feet over the predictions. More than 500 people were impacted in Montgomery and Chester counties, with \$120 million in public infrastructure costs.

A healthy watershed is better equipped to handle a rise in stormwater and rare flood events. Our watersheds have been impaired by development and sediment pollution. The impact of climate change on watersheds in this region is evident and touches every person in tangible ways, disproportionately impacting communities in environmental justice areas. Children in our region have witnessed the impacts of climate change, either directly through loss of their homes and property, the experiences of friends and family, lost days of school because of flooding conditions and damage to school buildings and loss of power. Long after the flood is cleaned up and power is restored, students are still processing the trauma associated with experiencing these natural disasters. There is a dire need to address the socio-emotional, economic and physical impacts and help students navigate these events. The need to engage children in awareness and positive, solutions based educational experiences is clear in this region. In short, it is our responsibility to build the environmental literacy in this region so that we can recover and become stronger.

As policy makers consider responses to the climate crisis, you will no doubt look to solutions that will make us more resilient and responsive to future events. This should include sustainability measures to lower our carbon footprint and invest in green infrastructure and nature-based solutions. According to the Green Building Council, schools across the country are being built for no additional cost than standard construction. The projects that result from these investments provide endless opportunities to provide authentic learning experiences for students while engaging them in solutions. Government can help by providing funding but also setting expectations and incentives for schools that participate in Pennsylvania's Pathways to Green Schools Program. The public also supports education connected to sustainability. according to the Yale Project on Climate Change Communication, 70% of Pennsylvanians recognize that climate change is happening and 77% believe schools should teach about global warming. In the 6th congressional districts, 80% of people believe schools should teach about climate change.

When students have the space in their daily school experience to discuss and process what is happening in the world around them and participate in locally relevant solutions, they will be prepared to thrive in a world that will no doubt continue to grapple with complex environmental challenges. There is a large body of evidence that demonstrates when students learn about and address locally relevant issues, they grow academically and build STEM skills.

As you explore investments in infrastructure to address stormwater and flooding, I urge you to consider the public school system in addressing the needs of young people in our communities. Pennsylvania is currently transitioning to new academic standards in science, which feature an environmental literacy domain. This presents a unique opportunity to bolster STEM education, systemically embed environmental education into formal school curriculums and increase environmental literacy across our communities. As PA schools are tasked with a re-alignment of science curriculum with a greater focus on the environment, they are working to address

inequities and make up for gaps in learning caused by the pandemic. They continue to face real barriers to success in this realm due to ongoing shortages in substitute teachers, bus drivers and other support staff. Elementary school teachers are challenged to engage in meaningful environmental education experiences in the classroom. Elementary school curriculum generally allows for 30 minutes of science or less per week and this is typically where environmental education content is assigned. Additionally, many teachers remain uncomfortable and not confident in teaching complex content like climate science. Teachers and administrators are eager to provide innovative and effective learning opportunities for students and will need support to get there.

The environmental literacy domain of the new standards is integrated with science, technology, and engineering; “Every student is capable of science, engineering, technological and environmental literacy.” and “Science, environment, ecology, technology and engineering can be explored through an integrated and active learning process”. (Pennsylvania Integrated Standards for Science, Environment, Ecology, Technology and Engineering, Grades K-5; American Institutes for Research and Pennsylvania State Board of Education, 2020). The addition of an environmental domain provides endless opportunities for teachers to truly integrate environmental literacy across disciplines in their curriculum.

Schools cannot do this work alone and another important stakeholder in this conversation is environmental organizations. There are many non-profit organizations dedicated to addressing environmental issues and providing environmental education. Informal learning centers, including museums, zoos, aquaria and nature centers provide real-world and relevant expertise that goes beyond the knowledge that exists in schools. According to Falk and Dierking (2010), “average Americans spend less than 5% of their life in classrooms and an ever-growing body of research demonstrates that most science is learned outside of school”. In 2012, the National Science Teachers Association (NSTA) stated that “more than half of a child’s waking hours are spent outside of school”. It is clear that a fraction of the responsibility of building an environmentally literate public rests in the public school system. While building capacity for schools is critical, we must also recognize the opportunities available in the non formal education sector and develop collaborations between schools to raise our collective environmental literacy.

Organizations that serve environmental causes and provide informal education have been hit hard by the pandemic so the added pressure from extreme weather events further diminishes their ability to work with schools for comprehensive, sustained partnerships. Policies and funding that support partnerships between schools and centers for informal learning will bolster the non-profit sector while supporting schools in our region.

There are many tools available to support both non-formal education and formal schools in building environmental literacy offered by the Department of Education and other entities, which I have included below.

Thank you for your time today and consideration in supporting environmental literacy in our region.

The PA Environmental and Sustainability Literacy Planning Tool (PA ELIT Plan for LEAs) template for Local Education Agencies or School Districts but may be modified for regional or individual building administration. The ELIT Planning tool is designed to encourage systemic, cooperative effort between administrators, teachers, and facilities managers as they address

academic/curricular, environmental, health, wellness and safety goals/needs while enlisting student and community voice and support in the process.

The Pathways to Green Schools Program is intended to provide recognition to schools across the commonwealth as they design, build and implement their school, district, or institution's environmental literacy and sustainability plans (Word) in their quest to achieve USDE's Green Ribbon School recognition.

[Pathways to Green Schools](#)

The Meaningful Watershed Educational Experience (MWEE) is a learner-centered framework that focuses on investigations into local environmental issues and leads to informed action. MWEEs are made up of multiple components that include learning both outdoors and, in the classroom, and are designed to increase environmental literacy by actively engaging students in building knowledge and meaning through hands-on experiences. In these experiences, the core ideas and practices of multiple disciplines are applied to make sense of the relationships between the natural world and society. MWEEs help connect students with their local environment and equip them to make decisions and take actions that contribute to stronger, sustainable, and equitable communities.

[NOAA Meaningful Watershed Educational Experience | National Oceanic and Atmospheric Administration](#)

The Center for Green Schools Resource for States paper

<https://www.usgbc.org/sites/default/files/2020-12/Opportunities-for-Green-Schools-in-2021-A-Resource-for-States.pdf>

Citations

Bartosh, O., Tudor, M., Ferguson, L. & Taylor, C. (2006). Improving test scores through environmental education: Is it possible? *Applied Environmental Education and Communication*, 5(3), 161-169.

Falk, J. H. & Dierking, L. D. (2010). *School Field Trips: Assessing Their Long-Term Impact*. Article first published online: 24 May 2010.

C. Sanford, V. Sokol (2017). *Preparing Informal Science Educators*, Springer International Publishing, DOI 10.1007/978-3-319-50398-1_16.

Pennsylvania Integrated Standards for Science, Environment, Ecology, Technology and Engineering, Grades K-5; American Institutes for Research and Pennsylvania State Board of Education, 2020

Yale Project on Climate Change Communication
[Home - Yale Program on Climate Change Communication](#)

Policy Hearing on Stormwater Management and Infrastructure Impact
Testimony provided by Drew Shaw, Environmental Planning Section Chief
Montgomery County Planning Commission
October 3, 2022

My name is Drew Shaw and I am the Manager of the Environmental Planning Section of the Montgomery County Planning Commission. I would to thank State Rep. Joe Webster for hosting this policy hearing, and am pleased to present this testimony today. In the wake of Hurricane Ida and the prospect of more severe and more frequent storms in the future, I hope we can all work together to identify and implement ways to protect residents, businesses, and critical infrastructure from the impacts of stormwater and flooding.

I am an environmental planner, and my comments today come from a planning perspective, and in particular the need for stormwater management and flood control planning in the Perkiomen watershed.

Perkiomen Watershed Characteristics

The entire watershed is 362 square miles, covering parts of Berks, Lehigh, Bucks and Montgomery Counties, and encompassing 52 municipalities. It is the largest watershed by area in Montgomery County, 164.42 square miles, and over 200,000 residents. The Montgomery County portion includes over 169 miles of streams, including the main stem and its tributaries. About 12% of the Montgomery County portion of the watershed is impervious cover – which includes parking lots, roads, and buildings, and other hard surfaces.

Stormwater Management and Flooding

All of these impervious surfaces generate stormwater that needs to be managed to prevent flooding. In the past, stormwater management focused on controlling what was called the 100-year storm, the storm that has a 1-percent chance of occurring in any given year. Smaller storms were “passed through” the management facility. As impervious surfaces increased, and as storms became more frequent and severe, these facilities were overwhelmed, and flooding increased.

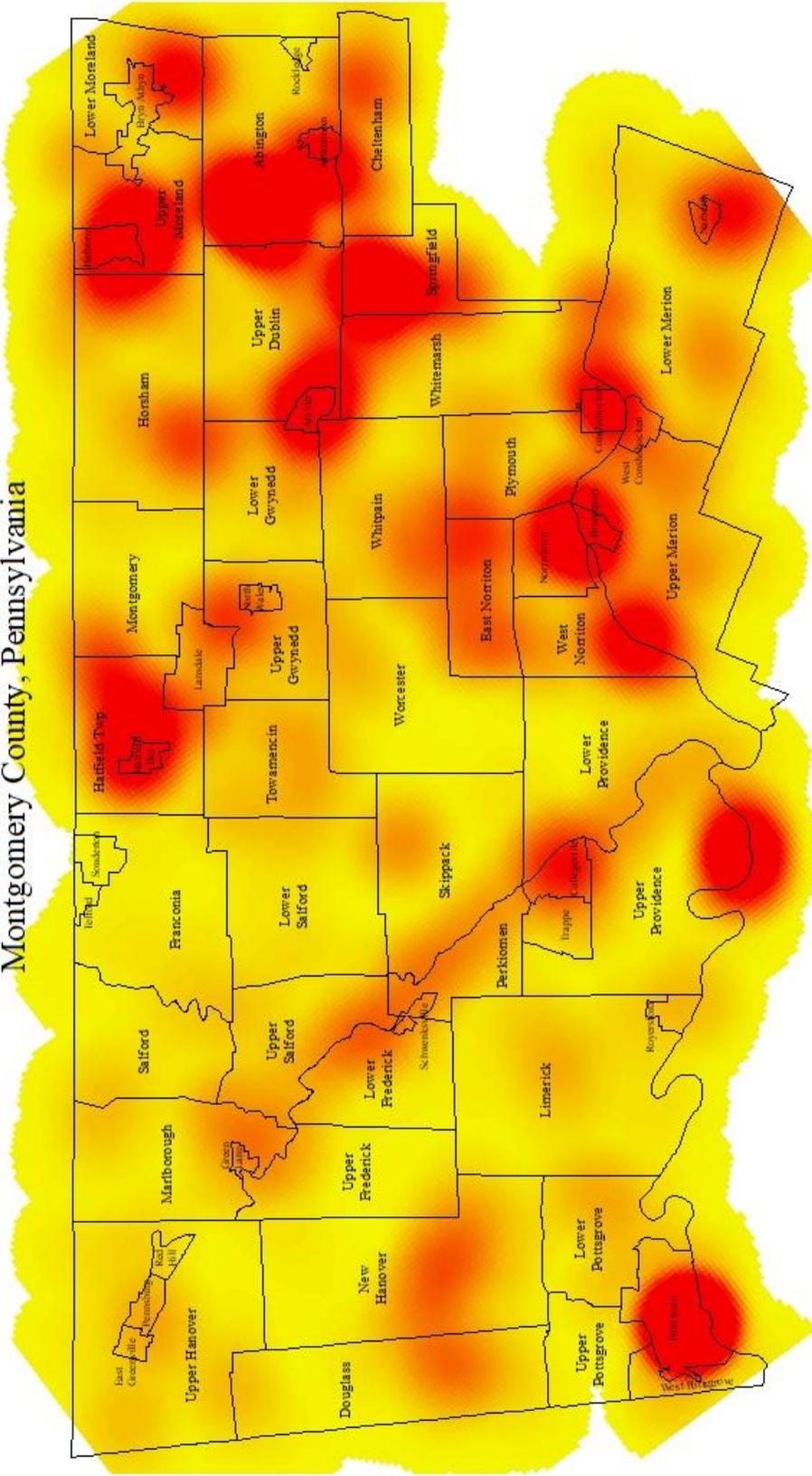
Hazard Mitigation Planning

The county’s Hazard Mitigation Plan identifies flooding as the number one threat in Montgomery County. Flooding can occur in any season, putting people and structures in danger. We estimate that there are 5,497 structures in the county that are either in the floodplain or partially within it. Of those 2,762 are completely within the floodplain. We have seen other structures located out of the defined 1% annual exceedance probability floodplain (the 100-year storm floodplain) sustain damage during floods in the past. The map on the following page illustrates the density of structures in the floodplain.

Floodplain Regulation

In 2011 and 2012, we worked with FEMA and the municipalities to update and upgrade the municipalities’ floodplain ordinances. The Planning Commission prepared a Model Floodplain

Montgomery County, Pennsylvania



Concentration of Structures within the 100 Year Floodplain



Montgomery
County

Planning
Commission

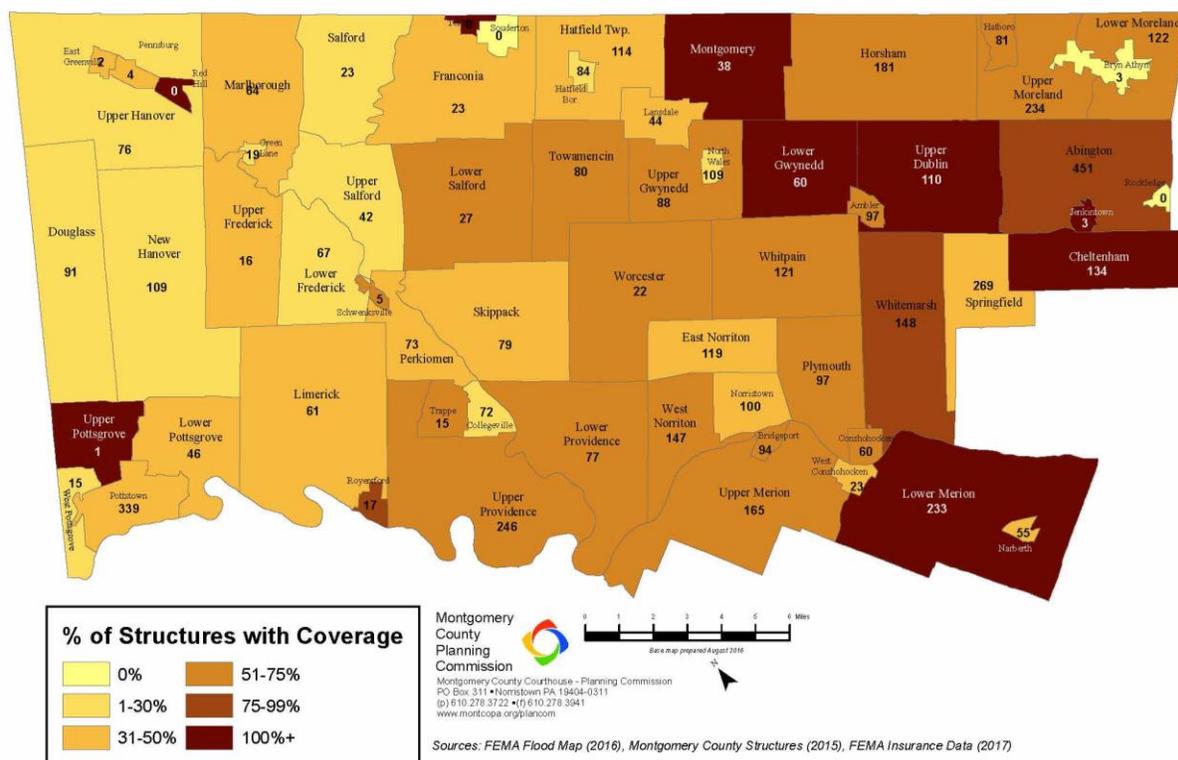
Montgomery County Courthouse - Planning Commission
PO Box 311, Chambersburg, PA 17004-0311
(717) 263-3722 (717) 263-2841
www.montcopa.org/plancom

Ordinance as a guide to the municipalities. This ordinance prohibited development and the placement of fill in the floodplain, except by conditional use. As you're probably aware, municipalities cannot completely prohibit development in the floodplain without risking legal challenges on the basis of a taking, which would likely become prohibitively expensive for the municipality. Nevertheless, development continues to occur in the floodplain, often at densities that concentrate people in these areas. This is an issue with legal and economic ramifications that needs extensive study to resolve this conflict.

Flood Insurance/Equity

Property owners within the floodplain can obtain flood insurance that can help them recover from damaging floods. However, the insurance is expensive, and not every property owner elects for coverage. There are over 1,000 structures along the Perkiomen Creek and its

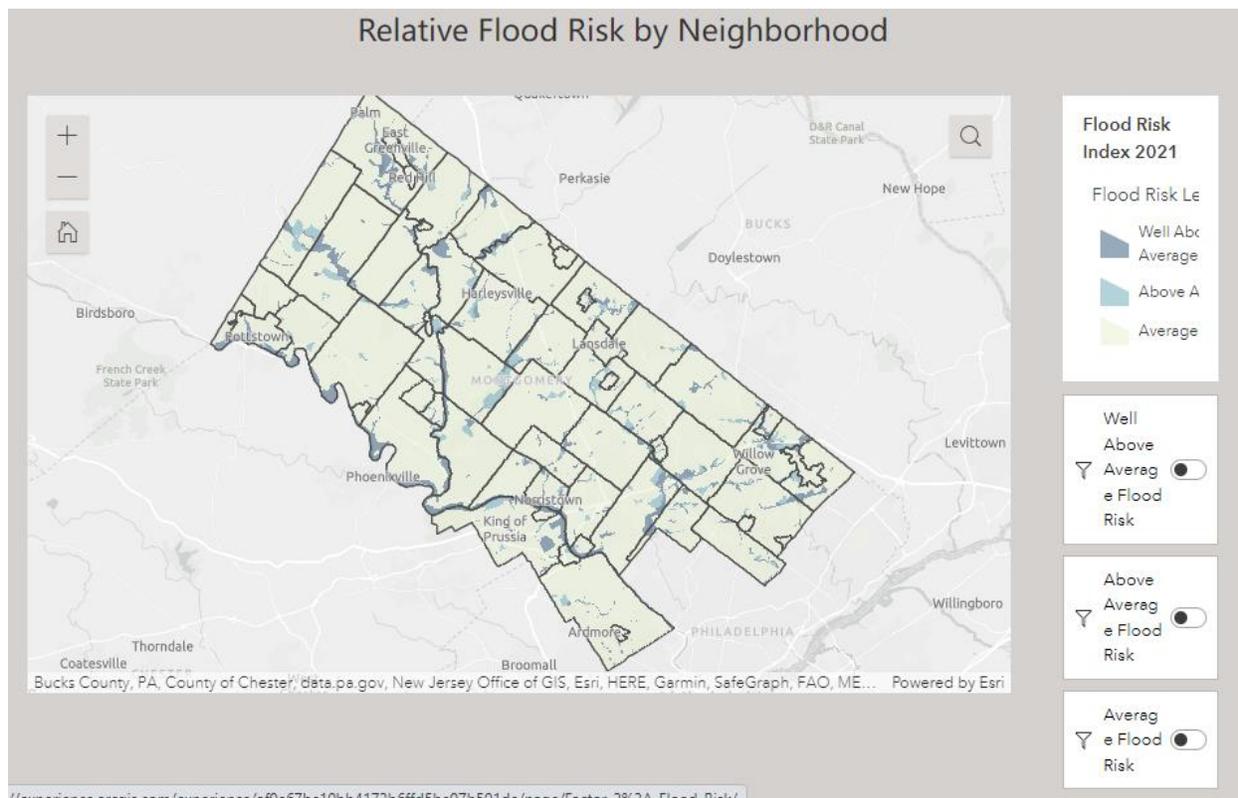
Percentage of Structures within the Regulatory Floodplain with Flood Insurance Policies in Effect by Municipality, 2015
Montgomery County, Pennsylvania



tributaries in the county that have flood insurance. Many other structures in the watershed do not have insurance. The map below shows the percentage of structures in the floodplain that are insured, to give you an idea of how sparse the coverage is in some cases.

Clearly, the flood insurance program can help those who can afford insurance get back on their feet after a flood, but something more is needed to reduce the impacts of flooding on residences and businesses.

The impact of flooding on Montgomery County’s residents differs depending on numerous factors, including age, economic status, gender, and race. Montgomery County has partnered with the Delaware Valley Regional Planning Commission to evaluate the impacts of flooding on county residents, based on the factors mentioned above and others that indicate potential disadvantage. The map below displays this evaluation.



Watershed Planning

Under the Stormwater Management Act of 1978 (Act 167), stormwater plans were meant to be prepared on a watershed basis, with the goal of managing stormwater comprehensively and in a coordinated manner, to prevent new flooding problems from developing, and keep existing problems from getting worse. It wasn’t a perfect program, but it did result in municipal ordinances that more effectively controlled stormwater. Unfortunately, Pennsylvania stopped funding the program, meaning that the cost of these plans, which frequently reached several hundred thousand dollars, was no longer able to be reimbursed. Montgomery County has continued to prepare plans in the eastern part of the county in partnership with the Philadelphia Water Department, which is able to cover the majority of the cost. However, there is no watershed-based stormwater management plan for the entire Perkiomen watershed, although plans have been prepared for the Swamp Creek Watershed, the East Branch Perkiomen Creek Watershed, and the Headwaters in Lehigh County.

Why is such a plan needed, and what would its impact be, potentially? Part of the planning effort would involve a study of how runoff “behaves” during a storm. The volume of runoff, and the timing of the peak flow in the various tributaries would be determined. This would help determine why flooding occurs where it does, and suggest solutions to flooding. These solutions

could include stormwater management regulations, so that when development occurs it includes adequate facilities to effectively manage the runoff. The plan could also identify regional solutions to large flooding issues. A study of this sort for the Perkiomen watershed would be expensive, due to the size of the watershed and the amount of data to be collected, managed, and analyzed, but from a planning perspective, it is needed to inform the decision making process, and to support the recommended solutions to stormwater management and flooding from the frequent summer storm, and the more severe storms.

Impacts of Hurricane Ida Remnants, and other, unnamed storms

We all remember Hurricane Ida, when 7 to 10 inches of rainfall fell between Sept. 1 and Sept 2 last year. The Perkiomen Creek was predicted to crest at 17.8 feet, but went to a new historic level at 26.3 feet. Extensive damage occurred to private and public property, and tragically, four people in the county died. Of the four deaths recorded in Montgomery County, two were in the Perkiomen watershed.

Critical infrastructure was damaged as well. Numerous roads and bridges were closed during and following Ida. This hampers the response effort, including ambulances, fire trucks, and police.

Public utilities providing critical water and sewer service were effected as well. For example, the Green Lane-Marlborough Joint Authority operates a large pump station that conveys flows to the sewage treatment plant. This was damaged by Hurricane Ida and will need to be replaced. It cost the Authority approximately \$90,000 to temporarily repair the pump station, and will cost around \$1 million dollars to replace. There is also work needed to repair the streambank in the vicinity of the treatment plant. I mention the example of the Authority to make a point. There are other, larger, critical facilities that sustained higher levels of damage and that will be more expensive to fix. However, the Green Lane-Marlborough Joint Authority is typical of the smaller scale critical facilities located in the more rural areas of the county. They have a much smaller customer base than say the Lower Perkiomen Valley sewer authority which serves 6 municipalities. While both large and small public facilities are needed, the small customer base of facilities such as the Green Lane Marlborough plant makes it very much more difficult for it to finance projects that repair damage from flooding. They and municipal authorities like them are in need of financial support in order to keep providing service to the public.

Emergency Response

It's not just the impacts to residents and property that we should be considering today. I want to mention a second, related aspect of this issue, and that is the impact on emergency response personnel, who respond to emergency situations during storms and other events. Regarding IDA, the response by county and local emergency response personnel was nothing short of heroic. There were a record 9,034 calls that came into the county's 911 dispatch center, according to Jason Wilson, who added that 467 water rescues were conducted. As of 3 p.m. on the Friday after the storm, the Montgomery County Department of Public Safety had received 932 reports of damage from the storm.

Local emergency response teams are effected, too. For example, Collegeville Fire Company was out during the storms as waters rise and additional road closures are needed for public safety. The company performed 8 water rescues that night, and responded to 4 accident incidences.

We all are very grateful that these men and women are willing to put their own safety at risk during storm events to come to the aid of others. But I have to recognize that their efforts are necessary *in part* due to decades of development that has occurred without sufficient stormwater management, and also due to a disregard of floodplain issues. Throughout the county in areas adjacent to streams, we see residential development occurring in the floodplain. The development is “floodproofed”, which generally means the residential units are built on top of several levels of structured parking, in order to raise the dwellings above flood heights. While this may prevent flood damage to the properties, it also likely mean that emergency response teams will be required at some future time to help evacuate the residents before or during a flood. The risk to the safety and lives of the emergency response personnel, and the cost to the municipality, could have been avoided or at least substantially decreased if development in the floodplain was more restricted.

Conclusion

The impacts to infrastructure and the people it serves from stormwater and flooding events have developed over the past 40 to 50 years. The result as you’ve heard is damage to public utilities, closure of essential bridges and roadways, destruction of private property, and even loss of life. It took decades for these problems to develop, and it’s going to take a likely going to take a long term, concerted and sustained effort to resolve these issues.

I am not suggesting that the impacts of Hurricane Ida could have been completely avoided through stormwater management, but I think it is clear that these impacts could have been reduced through planning efforts such as what I’ve described above.



Ursinus College

Testimony Before the Pennsylvania House Democratic Policy Committee:
Stormwater Management and Infrastructure Impact
Monday, October 3, 2022

Presented by Ursinus College:
Kate Keppen, Director of Sustainability at Ursinus College
Robyn Hannigan, President of Ursinus College

Good afternoon. On behalf of our colleagues at Ursinus College, we thank you for the opportunity to contribute, in a very meaningful way, to the timely conversation concerning the serious impacts that stormwater has on our communities.

Before approaching the subject of stormwater impacts, we wish to begin by acknowledging two indisputable facts that, for many of our neighbors, have led to a collective sense of urgency. First, it was little over a year ago when remnants of Hurricane Ida swept through portions of Pennsylvania. Our fellow panelists are addressing this at great length. Locally, the height of the floodwater could only be estimated as the United States Geological Survey's Graterford Bridge stream gauge was overwhelmed in the storm. This stream gauge records up to 20 feet of water levels, while the flood stage for the Perkiomen Creek is at 11 feet. Second, it has been well documented that impacts of the earth's changing climate will affect all of us. In fact, the Pennsylvania Department of Environmental Protection has estimated that every county in the Commonwealth will only continue to become warmer and wetter, and that its citizens might expect an increase in rainfall by eight percent.

Ursinus College, in Collegeville, Pennsylvania, is located in the geographic area known as the Perkiomen Creek watershed. According to the Perkiomen Watershed Conservancy, the Perkiomen Creek encompasses 362 square miles, with 55 municipalities and four counties within this geographic area. The Perkiomen Creek is one of the largest tributaries to the Schuylkill River.

Human actions on the land affect how stormwater moves through the watershed and into local streams. Thus, *we all* bear this responsibility. Our complacency will likely lead to worsening effects from major storms and the predicted increase in rainfall, or we can think innovatively and work to make our communities resilient. Stormwater regularly contributes to flooding events, disrupts groundwater recharge, and carries pollutants into waterways, potentially affecting residents' homes and businesses. It leads to short-lived or longer-term traffic and transportation issues and affects drinking water quality and recreational use of our streams and lakes.

We have an intricate and interconnected relationship with our water cycle on this planet. Here in southeast Pennsylvania, we are critically dependent on our streams and groundwater sources for drinking water. Stormwater running quickly over impervious surfaces does not recharge our groundwater. Sensible and sustainable protections that allow us to maintain and update drinking water infrastructure, while also conserving groundwater levels, are critical to protecting human health in the region. In addition, identifying the various forms of infrastructure that are related to or adjacent to our stormwater systems and/or streams will help in building community resiliency to climate change impacts. We need that infrastructure, along with the accompanying technology, to be modified or updated to account for climate change-related weather patterns.

If we are diligent and entrepreneurial in our approach, we might want to consider potential solutions from those who have also experienced significant infrastructural issues, including those from beyond the Commonwealth's borders. We must be intentional with the steps we take while also understanding there are so many unique variables that other communities and states confront. Solutions can take the form of partnerships, technological solutions, and updated and holistic regulations. For instance, permeable cement is being piloted in several West Coast municipalities. On par with traditional concrete and with permeability rates capable of handling most 100-year storm events, permeable cement or the development of other green materials could provide a practical and sustainable solution to flooding. Similarly, West Virginia, in response to repeated 100-year floods in recent years, established a [State Resiliency Office](#) that primarily works at the state legislative level to establish new flood management regulations. The office partners closely with individual towns and counties to implement changes in zoning, building codes, and other regulatory policies.

In addition to the updating and maintenance of our drinking water and stormwater infrastructure, we also need to put plans in place that take into account the environmental, social, and economic impacts of stormwater and flooding. Of particular note in the Perkiomen watershed is the absence of a cohesive

Act 167 Stormwater Management Plan. Stormwater management that follows science-based watershed modeling and best management practices can benefit all watershed residents. Creating a cohesive Stormwater Management Plan for a land area as large as the Perkiomen watershed would certainly be a complex task to undertake; however, streams, stormwater, and floods do not follow municipal and county lines. Actions in the headwaters of a stream invariably affect those downstream. Incentives from the Commonwealth can help county and municipal officials work through the planning process in coordination with one another.

The process should not stop with the creation of an Act 167 Stormwater Management Plan. The Environmental Protection Agency recognizes that watershed planning and implementation of practices to best protect water resources is an iterative and adaptive process. As such, we have, yet again, an opportunity to look at innovative ways in which downstream constituents engage in conversations about projects in headwater communities. Furthermore, the Commonwealth can facilitate innovative stormwater solutions by providing technical assistance, dedicating annual funding for counties and local governments to achieve watershed planning implementation, and encouraging inter-governmental partnership across municipal and county lines.

By way of example, [Massachusetts](#) provides an example of what can be done through a participatory collaborative planning process. Along with the Environmental Protection Agency, that Commonwealth requires small communities in the Massachusetts Bay region to develop stormwater management plans. This was an organic evolution of sorts, as the communities themselves came together to take ownership of issues related to flooding, sewage management, and coastal zone pollution. They recognized those issues crossed municipal boundaries and, since they were in the same county, they could use county-level organizational structures to implement management policies. The towns established green infrastructure test beds, each experimenting with something different: retention ponds, oyster reefs, culvert removal and dam removal, and greening buffer zones, for example. After several years of study, the towns came together to propose a series of countywide actions driven by policy improvements—zoning changes, as well as requirements for post-construction and new construction stormwater management—that included scaling the green infrastructure. Funding was provided by the federal Environmental Protection Agency, regional agencies, and through partnerships with industry.

Closer to home, at [Ursinus College](#), we have a successful history of bringing various constituents together to discuss topics, enacting faculty-mentored student research, working within the local community in civic engagement projects, and applying classroom learning to real-world scenarios.

Students, staff, and faculty have participated in round table discussions, a basin retrofit project on campus, stream water quality monitoring, and other projects developed around innovative stormwater best management practices. We have contributed to efforts by other local organizations, such as the Perkiomen Watershed Conservancy, to keep our streams clean and healthy, and continue to work with them; Associate Professor Denise Finney was named honored with the 2022 Teaching Excellence Environmental Award by the conservancy. Our commitment to environmental stewardship is unwavering.

We ask all of our fellow panelists and, respectively, our elected officials, to look at colleges such as Ursinus as a unique experimentation hub, where research, innovation, and dialog occur organically. As mentioned before, there are 55 municipalities in the Perkiomen watershed. Ursinus College is uniquely able to bring together municipal officials, municipal engineers, Environmental Advisory Councils, watershed organizations, nature and land conservancies, state and local government staff, drinking water providers and others, along with interested students, faculty, and staff, around the topic of stormwater impacts. For example, our [Parlee Center for Science and the Common Good](#) has hosted talks and policy conferences of national repute on topics as diverse as safeguarding the American food supply, pandemic preparedness (pre-COVID), and water quality in Flint, Michigan. We'd be honored to help facilitate and partner in this conversation.

Thank you for your time today and providing this opportunity to discuss this important issue. We believe that through collaborative participatory processes, the Commonwealth can assess and update drinking water and stormwater infrastructure, provide incentives and opportunities for local governments to work together on a holistic watershed-based approach as it relates to stormwater planning and permitting, and engage local colleges and universities, such as Ursinus College, to be places of dialog and action.

**Testimony for Pennsylvania House Democratic Policy Committee
Stormwater Management and Infrastructure Impacts**

October 3rd, 2022: 1:00PM

Testimony by Robert S. Pace

105 Shire Drive

Eagleville, Pennsylvania 19403

Ph: 443-841-8043

pacerob77@gmail.com

Good afternoon Representative Webster and members of the Policy Committee.

Self-Introduction

My name is Robert Pace. I am a resident of Worcester Township in Montgomery County, PA where I have lived for nearly 8 years. I am retired from both public and private sector careers with almost 43 years of experience in water resources planning and management. As a U.S. Army Corps of Engineers civilian for the Baltimore and Philadelphia Districts, its Headquarters in Washington, D.C., and for the U.S. Africa Command in Stuttgart, Germany, I served in leadership positions addressing critical regional, national, and international water issues. These included flood risk management, water supply and water security, navigation for deep water ports, and aquatic ecosystem restoration. In addition, I spent 15 years as an environmental consultant addressing many of these same challenges. In my retirement, I volunteer as a Master Watershed Steward with the Penn State Extension in Montgomery County, working on a variety of local watershed projects and educating the public on the importance and value of our watersheds. Since 2016, I have served as a committee chairperson of our homeowner association's responsible for managing our stormwater basins and rain gardens in the Stony Creek Farms community.

My testimony today is based on my collective professional experience and as a Montgomery County resident and volunteer with a passion for our water resources.

Evaluation of Flooding in our Region

Flooding and its devastating effects to life and property is not new to Montgomery County and our region. As a young water resources planner working for the Corps of Engineers in my first job in Washington, DC in 1976, I remember reviewing an early Flood Insurance Information Report for the East Branch Perkiomen Creek prepared by the Corps (Corps of Engineers, 1974). Subsequently, numerous analyses of flooding issues were undertaken by the Corps in several Montgomery County jurisdictions which served as baseline data for the development of Flood Insurance Studies later prepared by the Federal Emergency Management Administration (FEMA). By 2016, FEMA had

documented the extent of flooding in over 60 different jurisdictions in a Flood Insurance Study for Montgomery County (FEMA, 2016). The study was key in developing flood risk data used to establish actuarial insurance rates and to help local and regional planners promote sound floodplain land use.

In 2005, the Montgomery County Commissioners issued a county-wide Water Resources Plan recommending best management practices to improve stormwater control (Montgomery County, 2005). This document serves as a guide for local government, the private sector, and the public to better manage the county's water resources and address water supply, water quality and flooding issues, among others. In addition to this effort, individual Stormwater Management Plans (SWMPs) have been prepared under Pennsylvania's Stormwater Management Act (Act 167), for 10 of 17 (about 60 percent) of the County's watersheds (<https://www.montcopa.org/3845/Stormwater-Management-Plans-MS4-Program>). Watershed-based SWMPs provide municipalities with a framework, including model ordinances and management practices to control stormwater runoff from new development and include standards for managing the quantity and quality of stormwater runoff (PADEP, May 2007). Upon PADEP approval, municipalities must enact ordinances consistent with these plans.

The report prepared under Act 167 for the East Branch Perkiomen Creek typifies the type of analysis, level of detail, and types of recommendations that one would expect to find in an Act 167 Watershed Plan. In these plans, you will likely find coverage of the following important topics:

- A description of baseline conditions such as present and projected land use, drainage problems and proposed solutions, obstructions to flow and diversions, among others.
- A watershed technical analysis including hydrologic and hydraulic modeling to project flood flow frequencies and the elevation and lateral extent of the water surface under varying statistical flooding events.
- A review of stormwater control standards and various runoff control techniques and best management practices including structural and non-structural measures.
- A model stormwater management ordinance.
- Implementation priorities including Plan approval, countywide coordination and responsibilities for landowners and developers.
- Outline of advisory committees and a public review process.
- Relationship to EPA's National Pollutant Discharge Elimination System (NPDES) Permit Program.

The County-wide Water Resources Plan and Act 167 plans provide excellent information and guidance for local governments to use as a basis for informed decision-making to regulate stormwater. A model stormwater ordinance has been crafted by the County and is available for use by local jurisdictions. It is likely that implementation of local ordinances based on these plans have reduced the contribution of additional stormwater runoff to

County's streams, however it is unknown how much downstream flooding is lessened or mitigated by implementation of these stormwater ordinances and related improvements.

Finally, and most recently, those communities that are regulated by the Environmental Protection Agency's (EPA) Municipal Separate Storm Sewer System (MS4) program administered by the Pennsylvania Department of Environmental Protection (PADEP) must obtain a NPDES permit. Under their permit, they must develop and implement a Stormwater Management Plan which includes minimum control measures and best management practices. While this program may provide some incidental flood risk reduction benefits, it should not be confused, as it often is by the public, as a flood risk reduction tool. The MS4 program is primarily a water quality based program focused on the reduction in discharges of pollutants to impaired waterways designated by EPA. Therefore, budget allocations to address flooding should be made irrespective and supplementary to the MS4 program.

Observations

Extreme flooding events in southeastern Pennsylvania have been frequent, disruptive, damaging, and even lethal. Within the last two years in Montgomery County, we have witnessed over 8 inches of rainfall each from Tropical Storm Isaias in August 2020, and Tropical Storm Ida in September 2021. Impacts included devastating flooding from high intensity rainfall resulting in loss of life; structural damage including loss of commercial and residential buildings; damage to roads and bridges; road closures...some for several months; power outages; and a rapidly rising groundwater table overwhelming sump pump systems and damaging basements.

In a presentation made by the PA State Climatologist (Imhoff, 2019), he noted that trends indicate a $\frac{1}{4}$ inch increase in rainfall per decade which is over 2.5 inches over the last 100 years statewide. He further calculated that 4 months of rain that fell back in the early 1900's is now compressed into about a 3-month period today. In general, he reported a significant increase in the number of heavy rainfall events, and more flash flooding occurring outside of FEMA designated flood prone areas in Pennsylvania.

Nationally, we find that many areas previously defined as the 100-year floodplain could now be re-delineated as areas that are subject to more frequent flow events (i.e., 75 year, 50-yr, etc.) and that in some areas, land subject to the 100-year flood is expanding beyond historically calculated boundaries. In fact, for some areas of the U.S. protected by flood control structures such as levees and dams, it has been determined that the design criteria used to calculate the level of protection that these structures afford (i.e., 100-year flood protection) may no longer be valid and must be reevaluated to consider changed land use and revised flood flow frequency statistics.

With more frequent high flow events and increasing development, more residents and businesses are vulnerable to floodwaters in Montgomery County. What have we learned

from our experiences here in Montgomery County and from other parts of our region? I make the following observations:

- Rainfall and runoff patterns have accelerated in recent years due to more frequent and high intensity rainfall events.
- Development pressures have increased in the County and we may expect to see more outflow of residents from more urbanized areas to lesser populated suburban and rural areas with greater remote working opportunities in our post-Covid world.
- Proximity to streamscapes and natural areas continue to be desirable for homeowners and we can expect continued development pressure near our streams and rivers.
- Studies have shown that residents have short memories regarding flooding and natural disasters, with many emotionally bound to their homes and unwilling or financially unable to relocate from potentially hazardous conditions (Kates, 1962).
- At this time, Act 167 plans have yet to be prepared for about 40 percent of the County's watersheds to guide them in preparation of local stormwater ordinances.
- In addition, the County's Water Resources Plan was prepared 17 years ago and does not reflect updated projections for population, land use and hydrology.
- Local ordinances pursuant to Act 167 Plans are intended to prevent stormwater impacts from future development. Even if these sources were effectively controlled, flooding impacts based on pre-existing conditions (absence of future development) remain largely unmanaged. These conditions are worsening under higher and more frequent storm events expected with changing climatic conditions.
- Local stormwater ordinances are typically prepared in isolation and are not closely coordinated with adjacent and upstream jurisdictions. Their cumulative impact on flooding is not understood, particularly in the downstream and more densely populated portions of our watersheds.
- Correspondingly, investments in stormwater improvements and other flood risk reduction measures are largely made independently and are not, by design, undertaken within the framework of a holistic plan that considers cumulative downstream impacts. A mechanism is needed to promote a more comprehensive, meaningful, cost effective solution to our local and regional flooding problems.

Summary and Recommendations for Further Consideration

Despite the many helpful programs which I have described above, we are obviously falling short of achieving comprehensive flood damage reduction in Montgomery County and in many of the Commonwealth's watersheds. Efforts by local municipalities to implement stormwater ordinances and improvements pursuant to Act 167 studies are helpful but only provide a piecemeal approach to achieving comprehensive watershed-wide flood damage reduction. Local stormwater management ordinances are focused on future development, may be implemented differently in each township, are fragmented and

uncoordinated between jurisdictions, and do not identify basin-wide priorities....but rather localized needs and fixes. They do not resolve baseline conditions that have led to long-standing flooding issues...but rather only those related to new development, and moreover, they are not typically designed to address issues beyond jurisdictional boundaries. A broad geographic perspective is needed to address these issues comprehensively so that financial resources can be prioritized and directed to where they will have the greatest impact on the most vulnerable areas.

In this context, I would like to offer following recommendations for further consideration by the Committee and policy-makers:

- **Develop a comprehensive flood damage reduction plan using a watershed based and jurisdictionally coordinated approach.** This plan should focus on reducing peak downstream discharges and damage to property and include a full array of structural and non-structural flood risk reduction measure. The plan should be prepared at a sufficient level of detail to generate and prioritize project level recommendations, including project costs, flood damage reduction benefits, and trade-offs among potential investments. It should also identify potential funding sources for project implementation (i.e., design and construction).
- **Future effort should be directed to determining how and where flooding caused by existing development and land use can be addressed to lessen peak discharges and reduce property damage.** This will supplement current efforts that focus on future development. This effort could include modifications to existing practices such as:
 - Ensuring existing stormwater management basins operate per design guidelines;
 - Retrofitting older basins constructed prior to new stormwater requirements with an emphasis on optimum infiltration and control of outflow;
 - Encouraging protection and enhancement of wetlands to serve as a buffering device for flood waters;
 - Reconnecting floodplains to their streams in degraded reaches and with high rates of erosion/sedimentation and encroachment;
 - Incorporating green infrastructure features for major rehabilitation, repair, and replacement projects: roads, bridges, and flood conveyance features;
 - Employing flood mitigation features such as green roofs; elevating structures and/or flood proofing of commercial and residential buildings; and increasing parkland acquisition and buyouts of floodplain structures.
 - Traditional structural control features such as flow diversions, floodwalls, levees, detention, etc., where feasible, justified, and publically acceptable.

- **Formulation of a plan as described above should be undertaken by a coalition of entities at multiple jurisdictional levels and stakeholders.** This team must be capable of working closely together to address flooding issues from a watershed perspective, and not from a parochial, jurisdictional point-of-view. This group should strive to develop regional solutions that transcend individual needs of a particular municipality. Members could include local, county and state government representatives; regional and federal agencies; non-profit organizations including watershed groups; research and educational institutions; private entities, and other citizen and stakeholder interests. An entity capable of fostering cooperation is needed to lead and coordinate such an effort.
- **Funding for the remaining seven Act 167 Watershed Plans yet completed in the County should be provided by the state.** Of these, the **Perkiomen Watershed should receive high priority** due its history of flooding and damages.
- **Consideration should be given to tapping the full range of Federal and state programs for technical assistance and implementation funding.**

Because of the inherent difficulty of initiating a collaborative effort from the ground up, it may be useful to consider available Federal programs designed to provide assistance that transcend jurisdictional boundaries and are not burdened by local political and interjurisdictional barriers.

Examples of these that I am familiar with from my past professional experience include Corps of Engineers technical assistance programs such as the Floodplain Management Services Program <https://www.nae.usace.army.mil/Missions/Public-Services/Flood-Plain-Management-Services/> and the Planning Assistance to States Program (PAS) <https://www.nae.usace.army.mil/missions/public-services/planning-assistance-to-states/>. Flood Plain Management Services Program support is provided at full Federal expense. Typically, it has included: floodplain delineation, dam failure analysis, hurricane evacuation, flood warning systems, flood damage reduction, storm water management, flood proofing, and inventories of flood prone structures, among others. The PAS Program requires a 50/50 Federal/non-Federal cost-share (half of non-federal share can be in-kind) for technical assistance, including comprehensive planning. While neither of these provide detailed design and construction services, they can offer reputable technical expertise and strategic support that can be used to help jump-start a more comprehensive watershed effort.

Consideration should also be given to requesting assistance for a watershed study using Section 729 of the Water Resources Development Act of 1986, as amended (Corps, 2019). This authority allows the Corps to provide comprehensive and strategic evaluations and analyses that include diverse political, geographic, physical, institutional, technical, and stakeholder considerations. This approach addresses water resources

needs from any partner source and regardless of agency responsibilities, and provides a shared vision of a desired end-state that may include recommendations for potential involvement by the Corps, other federal agencies, or non-federal interests. Non-federal sponsors must provide \$25,000 for development of a detailed Project Management Plan (scope and cost estimate). Once developed, the non-federal sponsor must provide funding or in-kind contributions for 25 percent of the fully estimated and agreed upon watershed study cost.

Other Federal agency programs that may provide useful support and lend technical expertise should be further explored such as the U.S. Geological Survey, the Natural Resources Conservation Service, and the U.S. EPA.

When approaching watershed level issues, I suggest that these Corps and other Federal programs be considered on a parallel path and supplementary to, other State and local efforts to develop a locally collaborative approach, with attempts to secure Federal assistance where funding is available and allowing appropriate lead time.

REFERENCES

Montgomery County Planning Commission, 2005. Montgomery County Water Resources Plan.

Corps of Engineers, 1974. Flood Insurance Information Report, East Branch Perkiomen Creek and Indian Creek, Bucks and Montgomery County, Pennsylvania.

Corps of Engineers, 2019. Planning Bulletin No. 2019-1, Watershed Studies, 17 January 2019.

Federal Emergency Management Administration, 2016. Flood Insurance Study, Montgomery County, Pennsylvania (all jurisdictions). FIS # 42091CV001B, Revised March, 4th 2016.

Imhoff, Kyle, October 3rd, 2019. Climate Trends and Impacts to Pennsylvania (Power Point presentation). Department of Meteorology and Atmospheric Science, University of Pennsylvania.

Kate, R.W., 1962. *Hazard and Choice Perception in Flood Plain Management*. Chicago: [Dept. of Geography, University of Chicago].

Pennsylvania Department of Environmental Protection (PADEP), 2007. Fact Sheet. Pennsylvania's Stormwater Management Act (Act 167). 3930-FS-DEP4101 5/2007.

October 3, 2022

TO: Hon. Ryan Bizarro, Chair
And Members,
House Democratic Policy Committee

FROM: Vince Phillips
Retired Harrisburg Lobbyist

RE: Testimony

Disclaimer: The opinions expressed are my own and should not be construed as professional lobbying on anyone else's behalf. I retired as a professional lobbyist on January 1, 2021.

Rep. Bizarro and Members of the House Democratic Policy Committee, thank you for reviewing my comments of Pennsylvania's stormwater management/infrastructure impact.

While I am sure that others may testify on MS4 and the infrastructure demands and lack of local resources to address those Federal requirements, I am writing about legislation now before the Pennsylvania House of Representatives which, if adopted, could add severe financial burdens on smaller and rural water and sewer systems. This is Senate Bill 597 which was referred to the House Environmental Resources & Energy Committee on June 14, 2020.

Its' intent of increasing standards to ensure resident water quality and to deter the hacking into those systems is praiseworthy – after all, who could not want safe drinking water? But, compliance costs could result in smaller and rural systems being forced out of business and sold to large multi-state concerns. If true, that poses the question as to whether or not municipalities should retain control of a community resource or abandon it.

What are my concerns about Senate Bill 597?

- It applies to communities of 751 year-round residents and differs from the American Water Infrastructure Act (AWIA) of 2018 which requires community water systems serving 3,300 people to conduct a risk and resilience assessment and develop an emergency response plan to be updated every five years. Details re Federal Risk Assessments and Emergency response Plans: <https://www.epa.gov/waterresilience/awia-section-2013>. Why does PA need to cover more systems than the Federal Government?
- Covering more systems than the Federal Government is ambitious but poses costs to smaller and rural systems that may not be met. A risk and resilience assessment also known as a stress test can be a costly process involving consultants and a myriad of additional requirements that could diminish time spent on operations versus compliance-reporting staff time.
- Are the provisions of SB 597 consistent with EPA's Water System Cybersecurity Best Practices? Section 6706 of SB 597 Development of cybersecurity systems is less than half a page. EPA Cybersecurity Practices for the Water Sector are more specific: <https://www.epa.gov/waterriskassessment/epa-cybersecurity-best-practices-water-sector>.

- Is SB 597 compliant with the Infrastructure Investment & Jobs Act (aka Bipartisan Infrastructure Bill) grant requirements and **particularly Title VI Cybersecurity, Subtitle A, Cyber Response and Recovery (Section 70601), Subtitle C, Declaration of a Significant Incident (Section 2231)?** Title II of the Infrastructure Investment & Jobs Act, Clean Water, has several sections that may be applicable: **Section 50202, Wastewater efficiency grant pilot program; Section 50205, Clean water infrastructure resiliency and sustainability programs; Section 50207, Small publicly owned treatment works efficiency grant program.** If SB 597 requirements are not consistent with the Federal Infrastructure Law grant specifications, where does the money come from to upgrade systems to meet the stress test or Federal cybersecurity requirements for water and sewer systems?
- A related question is whether or not SB 597 meets the grant criteria from the Rural Development Service of the U.S. Department of Agriculture.

Before a bill setting water detailed and complex standards for smaller and rural water and sewer systems is enacted, there should be detailed research to make sure that PA standards are consistent with Federal standards. Not doing this advance homework means a forced re-tool later on to meet those standards.

The second issue is money. Senate Bill 597 does not list where the money will come from to fulfill any of the mandates. How much does an analysis of cybersecurity cost? One private sector vendor is Exida, a world-wide company that does industrial automation control systems for cybersecurity. How can an up-to-date cybersecurity system be implemented? Exida's first step is to conduct a National Institute of Standards & Technology (NIST) Compliance Risk Management Assessment. Assuming that SB 597 is consistent with NIST (although not verified in the legislative language), it would include: review of system vulnerabilities from external and internal threats. Reviewing automated systems utilized by the system, operation /maintenance of the system, and the various control systems:

- Authentication controls
- Administration controls
- User provision controls
- Organization risk management controls
- Continuity of operations controls
- Physical data center controls
- Source:
- <https://www.exida.com/Case-Study/cybersecurity-gap-analysis-and-high-level-risk-assessment>.

Does this sound inexpensive? Granted that a small or rural system would not contract with a global concern like Exida, the important thing to look at here is the methodology required to have secure operations.

Can smaller and rural systems pay for all of this?

To answer that basic question, one must first determine how close rural water and sewer systems are now to meeting the requirements of Senate Bill 597? Before SB 597 is considered, this important research must be considered. Fortunately, the General Assembly has several research resources:

- Legislative Budget & Finance Committee
- Joint State Government Commission
- The Center for Rural Pennsylvania

The Center for Rural Pennsylvania study, *Information Systems Security Readiness Assessment for Municipalities in PA (September 2020)* surveyed municipalities in PA. While not limited to water systems but local governance, it found:

Security-relevant budget: *Among rural respondents, 99 percent said their municipalities spent \$29,999 or less yearly on information systems security software and hardware. Overall, rural municipalities spent little on information systems security.*

Security-relevant software infrastructure: *Both rural and urban respondents reported lower adoption rates for more advanced types of security software including spam filters, intrusion detection systems, adware removers, internet content filtering software, Virtual Private Network (VPN), and e-mail monitoring software. Security software is more effective when it is installed on all the computers in a network. It was concerning that both rural and urban municipalities had unprotected computers.*

Source: <https://www.rural.pa.gov/download.cfm?file=Resources/reports/assets/17/Info-Systems-Security-exec-sum-2020.pdf>.

A study, [Drinking Water and Wastewater Infrastructure in Appalachia](#) (University of North Carolina 2005) provided an analysis of capital funding gaps for West Virginia systems – namely, do water system revenues equal the need for improvements? Their finding was no.

*Analysis of the documented needs for wastewater systems in West Virginia, versus current revenues, is instructive. **If these systems could put 10 percent of their current revenues aside for future capital costs, it would take each of them at least forty years to accumulate enough savings to address today's needs, not to mention future needs. Even if systems did want to use pay-as-you-go financing, for many, the needs are so much higher than the revenues that it is difficult to imagine how they would generate***

extra revenues. Source: <https://www.arc.gov/wp-content/uploads/2020/06/DrinkingWaterandWastewaterInfrastructure.pdf>

The West Virginia landscape includes many smaller, rural systems. A similar lack of revenue versus expenses doubtless exists here in Pennsylvania.

Options for Paying

How will rural and smaller-scale systems afford this? Options:

- Funding from system revenues
- State bonds/grants
- Specified items in the Capital Budget
- Federal grants

Revenues. Already addressed was the unlikely prospects of funding these costs from system revenues.

State Resources. State bonds are an open question as to availability and repayment costs.

State Capital Budget. Currently, there are approximately six projects where water and wastewater systems are specified. Some are for individual complexes such as Longwood Gardens' new wastewater system (Page 228; \$1.0 million); and a sanitary service infrastructure for unspecified economic development project in Lackawanna County (Page 282; \$1.0 million). Others are municipality/township projects such as upgrading water authority's water treatment plant and distribution system in Greene County (Page 263; \$8.0 million) and rehab of sanitary sewer system in Montgomery County (Page 362; \$6.0 million). Assorted non-SB 579 applicable projects say that funds would be used unspecified utility improvements, effluent treatment at various fish hatcheries, and welcome centers and rest stops. Source: Senate Bill 915 was signed into law by Governor Wolf as Act 27 of 2022 on June 27, 2022.

<https://www.legis.state.pa.us/CFDOCS/Legis/PN/Public/btCheck.cfm?txtType=PDF&sessYr=2021&sessInd=0&billBody=S&billTyp=B&billNbr=0915&pn=1757>.

Another state funding source is the DCED Small Water and Sewer Program but SB 597 requirements do not meet the eligibility requirements of this DCED Program. Source: <https://dced.pa.gov/download/small-water-and-sewer-guidelines/?wpdmdl=58151>.

Federal Resources. There are numbers of Federal programs from numerous agencies such as the USDA Rural Development agency, in addition to the ones listed previously. Compliance with the Federal criteria would be necessary in order for water and wastewater systems to qualify. Unknown is whether or not SB 597 requirements equal Federal requirements,

especially since the Federal threshold in terms of people being serviced is much higher than SB 579's.

Conclusion

In reporting on a hearing held this summer by the House Environmental Resources & Energy Committee on Senate Bill 597, Spotlight PA's Stephen Caruso writes, *"PA lawmakers are weighing legislation that would make it easier for private water companies to target municipal authorities for acquisition..."* (Patriot News August 9, 2022)

I suggest that the House Democratic Policy Committee recommend to the House Democratic Caucus that it should oppose Senate Bill 597.

Thank you again for reviewing this personal testimony.