

**MONTGOMERY COUNTY  
BOARD OF COMMISSIONERS**

JAMILA H. WINDER, CHAIR  
NEIL K. MAKHIJA, VICE CHAIR  
THOMAS DIBELLO, COMMISSIONER

WWW.MONTGOMERYCOUNTYPA.GOV



**MONTGOMERY COUNTY  
PLANNING COMMISSION**

MONTGOMERY COUNTY • PO Box 311  
NORRISTOWN, PA 19404-0311

610-278-3722  
PLANNING@MONTGOMERYCOUNTYPA.GOV

SCOTT FRANCE, AICP  
EXECUTIVE DIRECTOR

April 15, 2024

**SUBJECT:** Environmental Sustainability and Infrastructure in Lower Gwynedd  
**TO:** Lower Gwynedd Comprehensive Plan Steering Committee  
**FROM:** Claire Warner, Montgomery County Planning Commission

---

## Environmental Sustainability and Infrastructure

### What does it mean to be sustainable?

Sustainability can cover a lot of different issues. Environmental sustainability typically covers issues related to waste reduction, energy use, heat islands, tree canopy coverage, and watershed and floodplain protection. However, places are recognizing the importance of creating sustainable places that promote well-being. This theme of social sustainability addresses human health and equity, such as getting people out and moving to improve physical health, improving air quality, and creating opportunities for social interaction to promote mental health. For this chapter, we are covering the natural features of the township, ecological stewardship, and how infrastructure plays a role in building sustainable communities.

### Ecological Stewardship

Protection of natural resources and resiliency for future climate change is an essential element for any long-range plan. Well-functioning infrastructure allows for efficient provision of basic services to residents, such as energy and running water. Stormwater management is an especially critical consideration, as development and impervious cover reduce infiltration capacity and result in stormwater runoff that can impair local waterways and cause property damage. The township has tree coverage that provide positive ecological benefits and capture stormwater locally. While the township may be able to make larger impacts, individual residents can pursue smaller steps to reduce waste creation. Small steps taken at the household, neighborhood, and municipal level can have positive impacts on the local ecology.

### Geology

A region's geology influences characteristics of local natural resources including topography, soils, hydrology, and vegetation of a community. Geology also influences site suitability of construction, and therefore the development potential in a region. A region's bedrock can impact other factors such as infiltration rates, nutrient content, and agricultural capacity. Rock formation underlying the township inform understanding about water supply sources. The Stockton Formation makes up the southern portion of the township, and is better for aquifers and can support local water supply in wells, while the Lockatong Formation in the northern portion of the township has poor water storage capacity.

### Soils

Soil is made up of weathered bedrock, organic matter, and soil organisms. Human activity also influenced the soil type and makeup. Two important soil classifications are hydric soils and important

agricultural soils. Hydric soils are soils that are periodically wet and are located in areas that often support the growth of wetland vegetation. Important Agricultural Soils are located throughout the township, but primarily in areas with less history of earth disturbance such as preserved open space, utility line corridors, and along streams. Soil types exhibit different properties (such as depth to bedrock, depth to water table, internal drainage, erosion hazard, bearing capacity, and slope), which help to determine development suitability of an area.

### Steep slopes

Areas with slopes in excess of 25% are considered undesirable for development because of the increased risk of erosion and runoff, and the amount of grading needed for building site stabilization. The dominant natural feature of Lower Gwynedd is the Wissahickon Creek and its tributaries, which drain into the Schuylkill River. The highest elevation in the township is 470 feet above sea level, located on a ridge near Welsh Road and Swedesford Road. The lowest point is at 195 feet in the southwest boundary of the township where the Wissahickon exits the township. A major basin ridge, located in the northeastern corner of the township, separates the Wissahickon and Neshaminy watersheds.

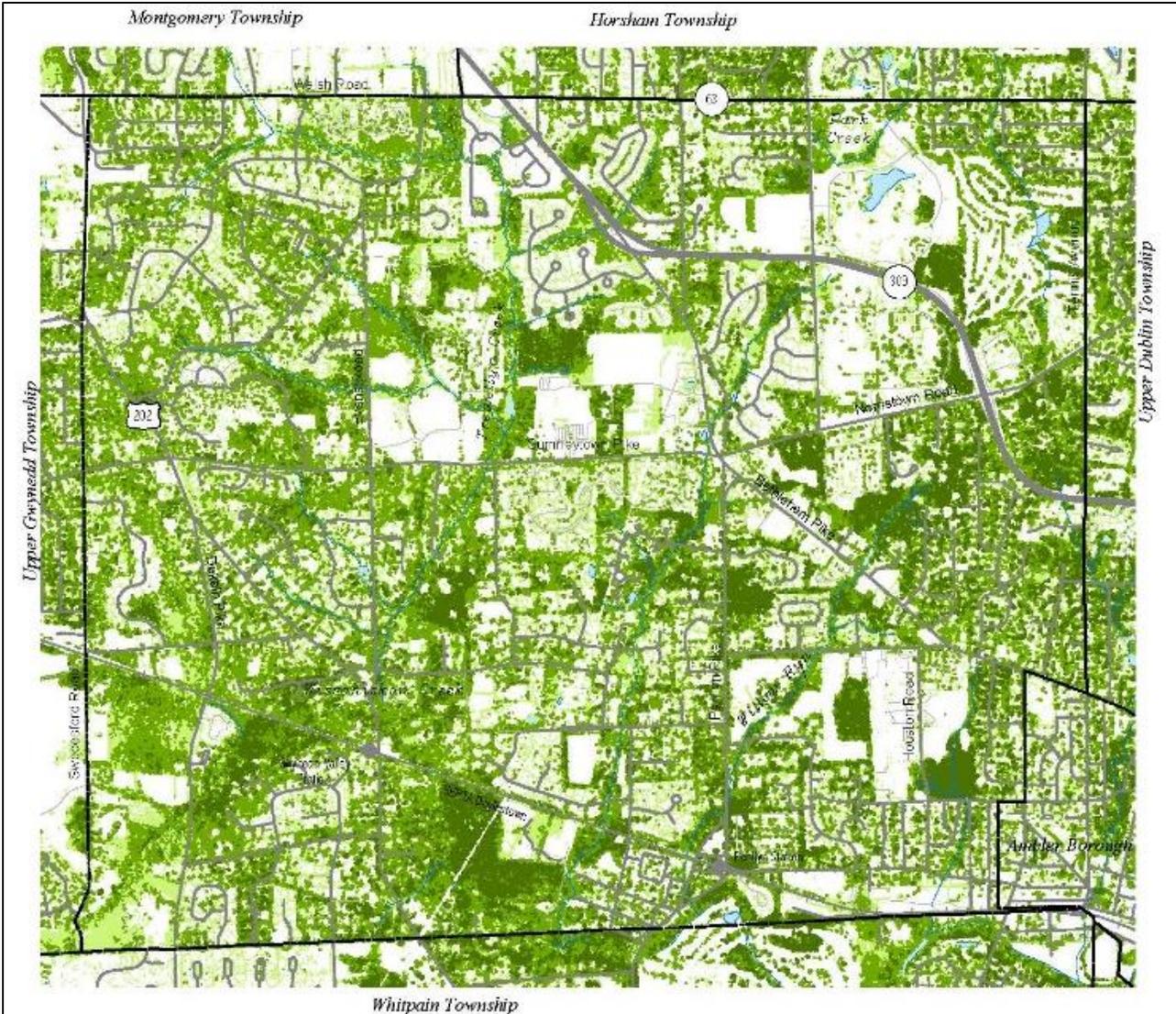
Like geology and soil composition, slopes are important for development. Flat ground has poor drainage, despite soil conditions, and construction on steep slopes of over 10% can cause erosion. Few areas of the township are entirely flat, and only occur within the floodplain. Almost all of the steep slopes in Lower Gwynedd occur around the Wissahickon.

### Tree Cover

Shade trees provide many social and environmental benefits to a community, including improving air quality, providing shade cooling, beautifying streetscapes in commercial areas, and enhancing the appearance of a neighborhood. Trees help infiltrate rainwater which can reduce stormwater runoff. The tree canopy also provides essential habitat for a variety of birds, insects, and animals. Lower Gwynedd has great tree canopy cover, and trees over 40 feet tall are clustered in preserved open spaces areas and around waterways.

### Heat Islands and Impervious Surface Coverage

Heat islands can affect communities by increasing summertime peak energy demand, air pollution and greenhouse gas emissions, heat-related illness and mortality, and water pollution. The heat island effect map shows the relative difference in the average surface temperature in different parts of the township. Those areas of the township that are more heavily developed with greater concentrations of impervious coverage are noticeably warmer than areas of the township where there is more tree canopy and less impervious coverage. Maintaining the established tree canopy and requiring new canopy trees be planted along roads and in large surface parking lots, in addition to reducing impervious coverage is important for healthy temperatures.



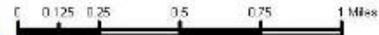
### Tree Canopy

- Less than 20 feet
- 20-40 feet
- Greater than 40 feet

Source: U.S. Department of Agriculture & University of Vermont, 2010

- U.S. Route
- Pennsylvania Route

Montgomery  
County  
Planning  
Commission



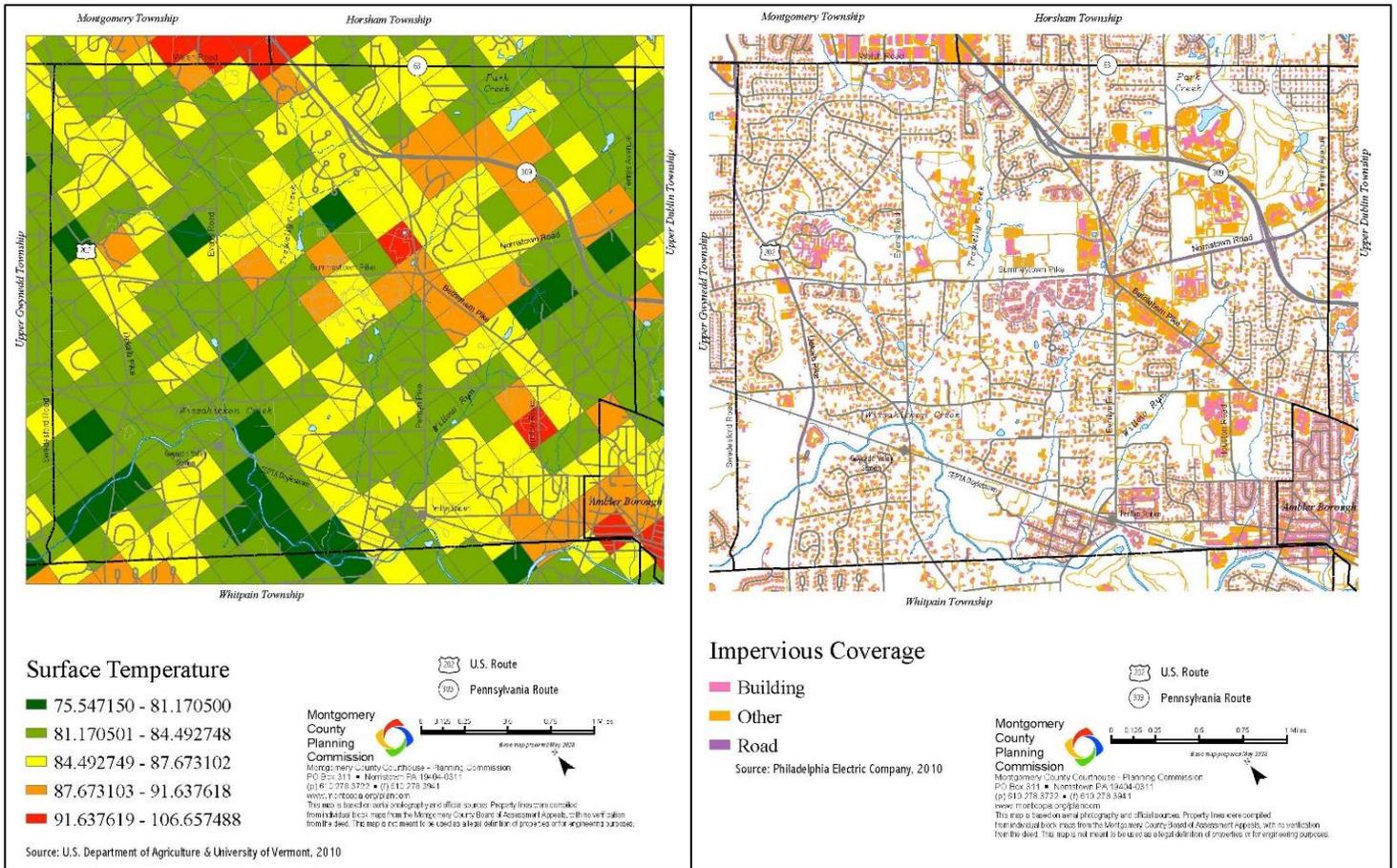
Base map prepared May 2009



Montgomery County Courthouse - Planning Commission  
PO Box 311 • Norristown PA 19304-0311  
ip: 610.278.3722 • ff: 610.278.3941  
www.montcopa.org/plancom

This map is based on aerial photography and official sources. Property lines were compiled from individual block maps from the Montgomery County Board of Assessment Appeals, with no verification from the deed. This map is not meant to be used as a legal definition of properties or for engineering purposes.

The maps below illustrate the impact of impervious surface coverage on surface temperatures.



## Water Resources

### Watershed Protection

The land area in a region where water resources drain into a common water body, either overland or underground, is known as a “watershed”. Managing water resources within the watershed is a critical component of preserving the ecological health of an area as well as ensuring that water supplies remain unpolluted. High percentages of impervious cover in urban areas increase water runoff volumes and rates, especially during and after storm events, which can cause erosion and sedimentation problems for waterways downstream. Erosion and sedimentation of waterways lead to impaired streams that put wildlife and water quality at risk. Mitigation measures include stormwater management to control the amount of contaminated runoff that reaches waterways and ground water recharge areas.

Lower Gwynedd is nearly entirely within the Wissahickon Watershed. A portion of the northeast corner of the township is within the Neshaminy Watershed (Park Creek, Little Neshaminy Creek), which ultimately feeds into the Delaware River. The Wissahickon Watershed area contains a total of 64 square miles that drains into the Wissahickon Creek or one of its tributaries. The Wissahickon Creek is designated an “impaired” creek due to elevated sediment and nutrient loads. This means that the creek is polluted to an extent that aquatic life, including insects and macro-invertebrates, are negatively impacted. The most common source of impairment was identified as urban runoff/storm sewers. Other municipalities that are within this watershed include: Montgomery Township, Lansdale Borough, Upper

Gwynedd Township, North Wales Borough, Whitpain Township, Ambler Borough, Upper Dublin Township, Whitmarsh Township, Abington Township, Springfield Township, and the City of Philadelphia. The watershed is managed and maintained by Wissahickon Trails.

### *Wissahickon Creek Water Quality Improvement Plan*

In August 2016, thirteen municipalities signed an intergovernmental agreement to create the Wissahickon Clean Water Partnership which signifies a commitment to work collaboratively to improve drinking water, mitigate flooding, reduce streambank erosion, protect fish and wildlife, and restore recreation area throughout the Wissahickon Creek corridor. In September 2019, a draft Wissahickon Creek Water Quality Improvement Plan (WQIP) was released. Key watershed-wide policies in the WQIP are related to decreasing impervious surfaces, increasing tree cover, protecting the riparian zone along the creek, and ensuring consistency in stormwater management ordinances.

Each of the municipalities involved in the water quality improvement plan will be responsible for the implementation of projects to reduce stormwater runoff, construct green stormwater infrastructure, and improve the ecological health of local habitats.

### *Riparian corridor protection*

The area of land adjacent to stream corridors is known as the “riparian corridor.” Maintaining and enhancing existing vegetation within the riparian corridor has many benefits including stabilizing streambanks, filtering stormwater runoff, and protecting sensitive habitat. A 2012 study by the Heritage Conservancy evaluated the status of riparian corridors on selected streams in Montgomery and Bucks counties. Lower Gwynedd received grant funding for a streambank stabilization project to repair eroded streambanks within the Willow Run tributary to the Wissahickon Creek, which will help control erosion and reduce sediment and other pollutants.

## Wetlands and Floodplains

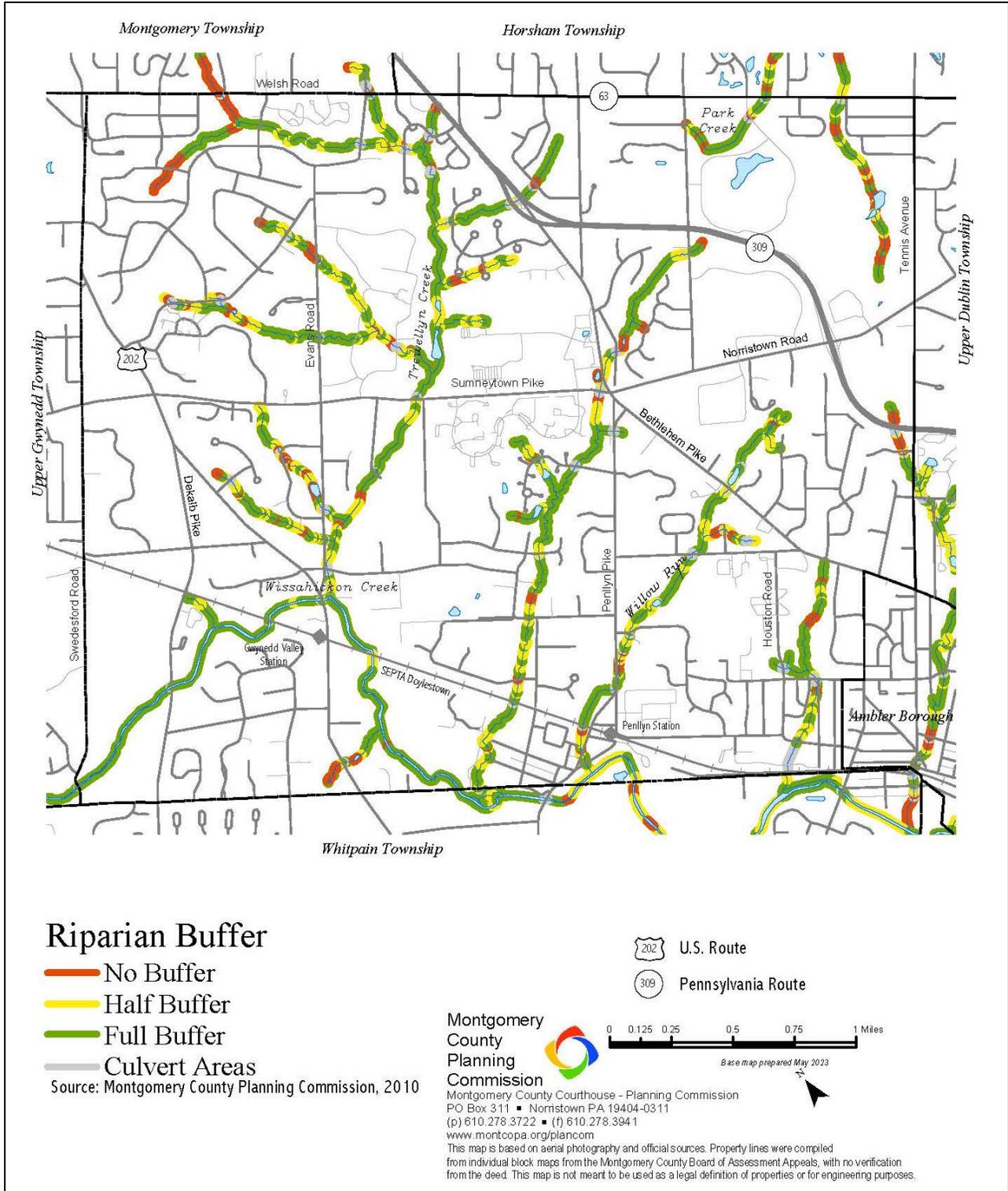
### *Wetlands*

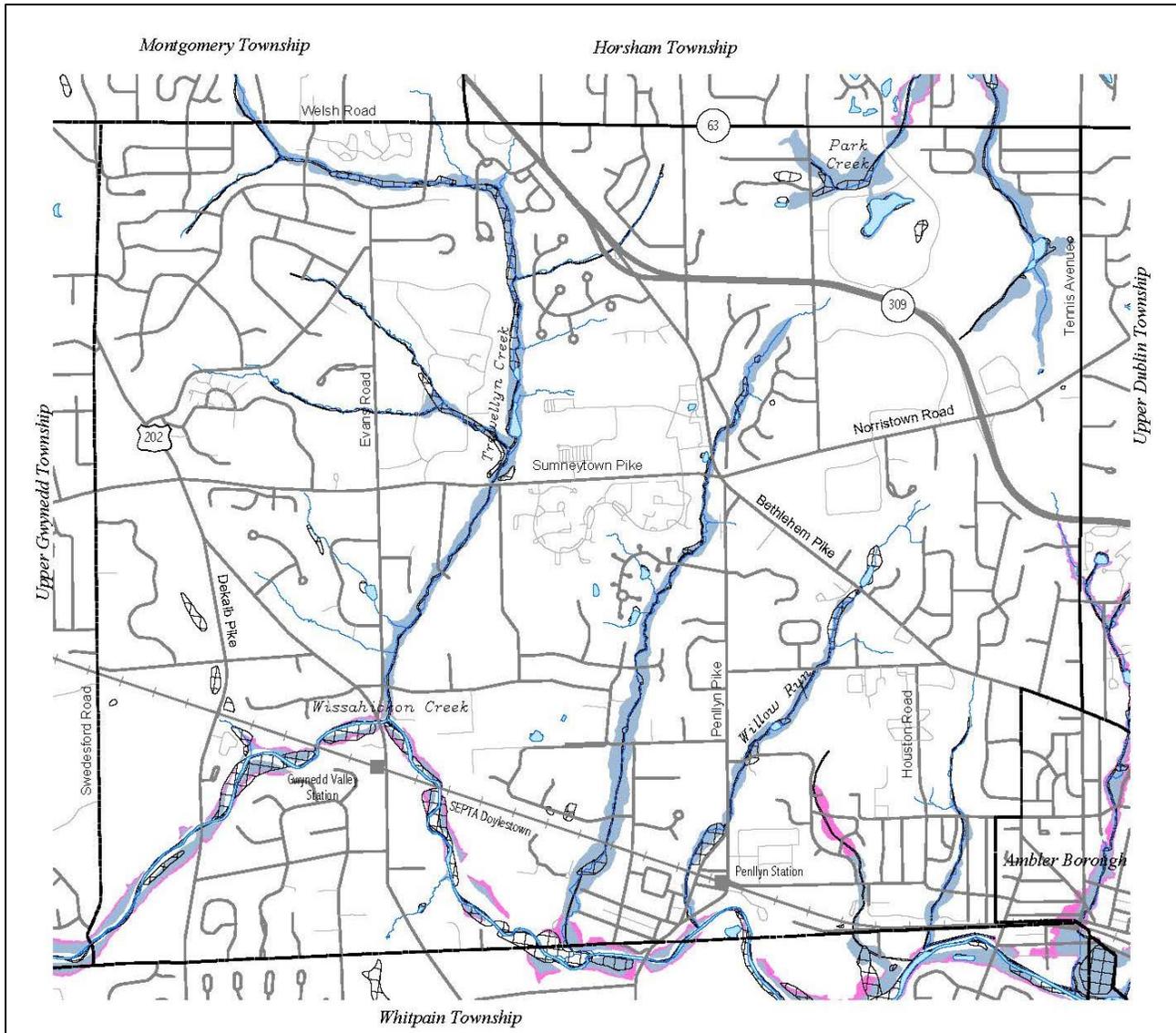
Wetlands are defined as areas of land that are either permanently or seasonally saturated with water. Wetlands provide valuable ecological benefits including riparian habitat, flood and erosion control, groundwater recharge, and pollutant filtration. In addition, certain aquatic and amphibious animals, and different species of grasses, sedges, and wildflowers are part of the unique ecosystem.

### *Floodplain Protection*

Floodways are defined by the percent chance of occurrence within any given year: the two most common designations are the 1% annual chance flood (100 year flood) and the 0.2% annual chance flood (500 year flood). Flood prone soils are generally found near streams and water bodies where development is hazardous. FEMA recently updated the floodplain insurance rate maps (FIRMs) for Montgomery County effective March 2016 and all municipalities were required to update their floodplain ordinances to reflect these changes.

Installation of stormwater BMPs like localized detention basins and rain gardens, as well as increased tree and vegetative cover where appropriate, contribute toward stormwater capture and infiltration to help mitigate negative effects of rain events. Lower Gwynedd is characterized by its numerous streams and waterways, which flow across the township to the southern border to the Wissahickon Creek. Therefore, floodplains are concentrated in the lower portion of the township around streams.





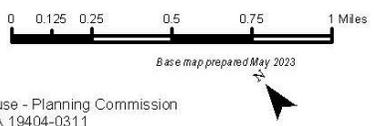
-  Wetlands
-  500 Year Floodplain
-  100 Year Floodplain

Wetland Source: U.S. Department of the Interior,  
Office of Biological Services  
for the National Wetlands Inventory.

Floodplain Source: Federal Emergency Management Agency,  
Federal Insurance Administration,  
Flood Insurance Study for Lower Gwynedd Township, 2015

-  U.S. Route
-  Pennsylvania Route

**Montgomery County Planning Commission**  
  
 Montgomery County Courthouse - Planning Commission  
 PO Box 311 ■ Norristown PA 19404-0311  
 (p) 610.278.3722 ■ (f) 610.278.3941  
[www.montcopa.org/plancom](http://www.montcopa.org/plancom)  
 This map is based on aerial photography and official sources. Property lines were compiled from individual block maps from the Montgomery County Board of Assessment Appeals, with no verification from the deed. This map is not meant to be used as a legal definition of properties or for engineering purposes.



## Stormwater Management

The majority of rainfall that lands on impervious surfaces, such as roads, parking lots, and rooftops, becomes stormwater runoff that discharges into local streams directly or is captured through storm drains and conveyed to discharge locations. Stormwater carries particulate matter such as motor oils, sediment, and litter picked up en route to storm drains and can pollute the streams and rivers into which it discharges. Proper stormwater management reduces this type of non-point source pollution and helps to maintain water quality.

Under the EPA's enforcement of the Clean Waters Act, the township is required to maintain a Municipal Separate Storm Sewer System (MS4) permit with DEP. MS4 programs are renewed every 5 years and a yearly report must be submitted to DEP to track progress. In addition to the MS4 permit program, the township is also subject to Total Maximum Daily Load (TMDL) regulations for nutrients and siltation. A TMDL refers to the amount of a certain pollutant that a water body can contain and still be a healthy stream. The amount in excess of the "total maximum" must be removed to maintain water quality. This requires the township to take DEP-approved actions to remove nutrients and siltation from the creeks.

*Green Stormwater Management Strategies.* One way the township can reduce stormwater flows to meet MS4 requirements is to capture rainwater before it enters the system. Strategies for capturing stormwater include naturalized stormwater basins, permeable green parking lots, and rain gardens, among others. Rain barrels are an inexpensive and easy to install feature for both residential and non-residential properties. Rainwater is diverted from downspouts into these barrels where it is stored until it can be discharged after the rain event when the ground is no longer oversaturated. This provides an excellent source of water in between rains to help water gardens and lawns and allows for better infiltration.

## Infrastructure & Energy

Infrastructure systems that provide drinking water and convey and treat wastewater are essential to the safety and comfort of the township's residents, workers, and visitors. Energy, typically in the form of electricity or natural gas, is another essential component of the township's infrastructure.

### Water infrastructure

In 1951 the Borough of North Wales purchased the Water Company under the Pennsylvania Municipalities Authority Act of 1945 to form the North Wales Water Authority (NWWA). The NWWA operates as a nonprofit municipal authority and is governed by a board of five people appointed by the North Wales Borough Council. Throughout the second half of the 20th Century, the NWWA expanded into surrounding municipalities through acquisitions of other water companies. Today the Authority serves 11 municipalities in Montgomery and Bucks Counties. In addition the Authority has numerous wholesale agreements with neighboring municipalities to supply supplemental water.

### Sewer Infrastructure

Lower Gwynedd maintains approximately 100 miles of sewer lines, two pump stations and five metering stations. The township handles the construction of sewer lines and contracts with Bucks County Water and Sewer for maintenance of the pump stations. The township's wastewater is treated at the Ambler Wastewater Treatment Plant.

### Energy

The electric transmission system that carries electricity is owned and maintained by PECO. The Limerick Nuclear Power Station produces 40% of the electricity used in the region. Gas supplies are obtained from interstate gas transmission companies.

Buildings are a major source of energy use for heating, cooling, lighting, and ventilation. Designing and constructing buildings and building renovations with green building practices can help reduce a building's energy use. Finding ways to increase the use of renewable energy (e.g., solar, wind, geothermal) is one way to help reduce the environmental impact of generating, transmitting, and using energy. Renewable energy refers to energy that can be harnessed from natural which help reduce reliance on fossil fuels and nuclear power for the township's energy needs. In anticipation of increased interest of alternative fuels, municipalities should have clear regulations to encourage and accommodate the appropriate and safe installation of renewable energy infrastructure.

*Vehicle Emissions.* According to the Delaware Valley Regional Planning Commission (DVRPC), a quarter of the Greater Philadelphia region's greenhouse gas emissions come from on-road transportation. In addition to changes that reduce vehicle miles traveled and fuel efficiency upgrades, electric vehicles are another way to reduce greenhouse gas emissions from transportation. Battery-operated electric vehicles are increasingly becoming a popular vehicle choice due to lower maintenance and fuel costs and reduced greenhouse gas emissions. Individuals with electric vehicles can charge their vehicle's battery by plugging it into the electric grid. Although most individuals with electric vehicles install chargers at their homes, the demand for charging stations at employment and commercial centers is growing. In response to this trend, many municipalities are encouraging the installation of charging stations with dedicated parking spaces for electric vehicle charging.

## Waste Reduction

### *Trash and recycling*

The Pennsylvania Municipal Waste Planning, Recycling and Waste Reduction Act of 1988 established requirements for comprehensive municipal waste management, including encouraging recycling, conservation, and waste reduction. Lower Gwynedd contracts Hough Associates as their recycling consultant.

### *Yard debris and composting*

The township offers seasonal collections of certain types of yard waste, including grass clipping and fall leaves. Any yard waste collected is composted and diverted from the landfill, and is therefore considered recycling and contributes to the township's overall recycling rate.

In general, food waste accounts for up to 40% of solid waste by weight. By encouraging households and institutions to compost their kitchen scraps, the total weight of solid waste generated can be greatly reduced. Reducing the amount of food waste in a community's trash can also reduce the unpleasant odors associated with trash collection. Many of the township's residential lots are large enough to accommodate on-site composting of food waste and smaller yard debris, such as leaves. Offering educational programs and low-cost compost bins to residents could help increase the practice of residential composting.

*Recycling Grant Programs.* The Pennsylvania Department of Environmental Protection (DEP) administers the Recycling Performance Grant Program, which provides grants to municipalities that offer recycling programs. Grant amounts are based on the weight of approved recyclable materials collected annually, as well as the municipality's population. Both residential and commercial recyclables can count towards the municipality's grant amount; therefore, detailed and accurate reporting of recyclables collected by all haulers that operate within the township is important. The PA DEP also offers Recycling Program Development and Implementation Grants that reimburse counties and municipalities 90% of eligible recycling program development and implementation expenses, such as educational programs, curbside recycling bins, and leaf waste processing programs.