



## Chapter 5

# Natural Resources

## Geology

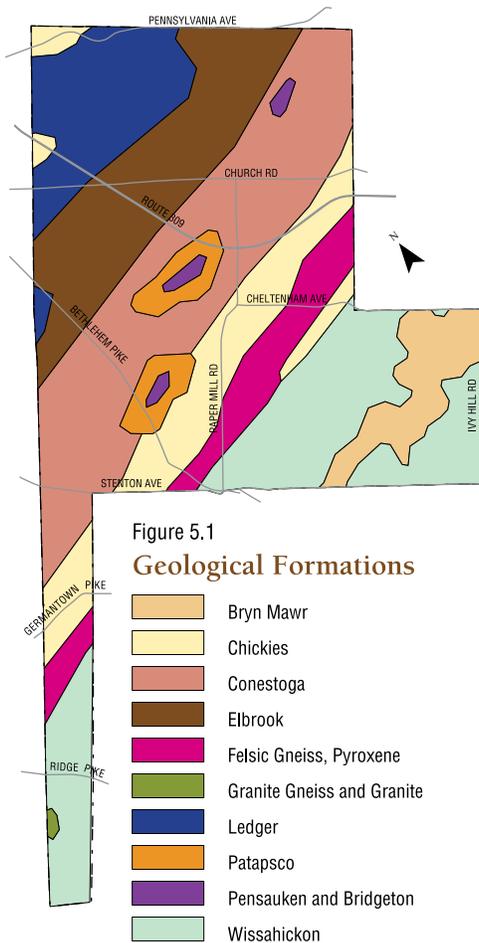
The foundation for the natural resources in the township is the unique characteristics of its geology. Over the centuries the forces of nature and the activities of people have influenced the land and the hydrological features of the area including soils, wetlands, surface and ground water, vegetation and topography. The geological formations in Springfield are described below and shown in Figure 5.1:

The largest formations underlying Springfield are Ledger Dolomite/Elbrook/Conestoga Limestone. The limestone and dolomite formations yield trap rock and calcium rich rock that was quarried for various industrial and construction uses. Sink holes can form in limestone formations when water dissolves portions of the rock resulting in underground cavities. Care must be taken in the development of buildings and the management of stormwater in these areas. This formation is found in Oreland, Enfield and much of Flourtown.

Another major formation in the township is Wissahickon Schist/Felsic Gneiss underlying much of Wyndmoor, portions of Erdenheim and the panhandle. Schists are highly weathered rock. Granite is harder and creates relatively steep but stable slopes.

Chickies Quartzite is metamorphic rock, formed when sandstone is exposed to extreme heat and pressure. It is a hard dense rock that weathers slowly and forms narrow hills and ridges. It extends from the township line of Cheltenham through Enfield, across Paper Mill Road into Erdenheim and parts of the panhandle.

The Bryn Mawr formation covers a large portion of Wyndmoor. The mix of gravel and sand is deeply weathered with moderate to high permeability and good surface drainage. Two small areas of the township—near Sandy Run Creek and north of East Mill Road—contain Diabase, an igneous rock also referred to as “black granite.” Diabase intrusions are very resistant to erosion, weathering, water infiltration and ground water movement.



Source: Pennsylvania Geological Survey, 1980



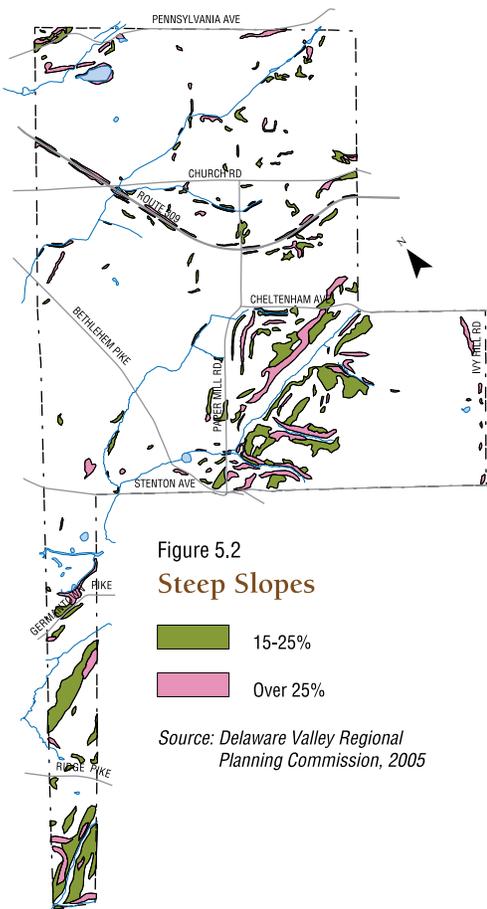
Patapsco formation is gravelly sand and clay, deeply weathered, with moderate to high permeability. This formation is found in two small areas in Flourtown. The Pennsauken/Bridgeton formations are found in three small areas next to Patapsco formation and near the North Hills Country Club and are also deeply weathered and have good surface drainage.

## Topography

### Steep Slopes

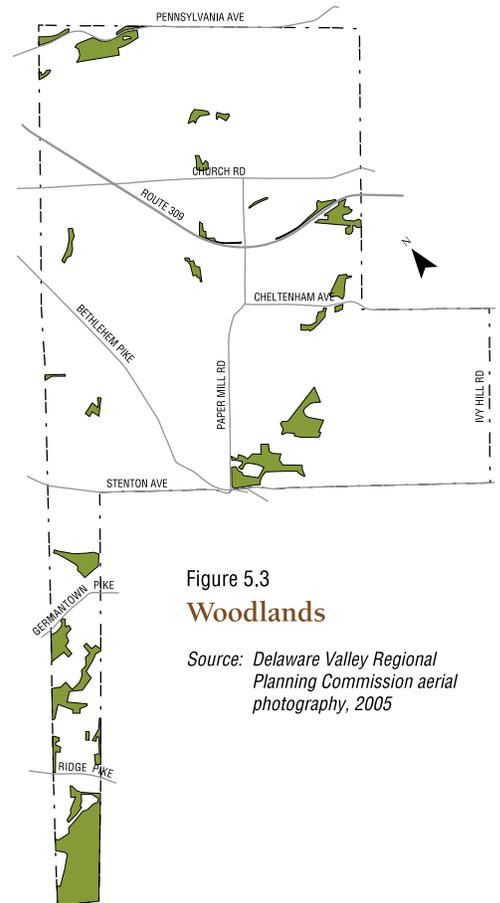
Significant changes in slope or elevation create dramatic landscapes that contribute to character of a community. Steep slopes are environmentally sensitive areas, often easily

eroded, and can be a danger to health and safety if not protected. Erosion potential is greater when vegetation is removed, resulting in increased stormwater runoff and undesirable sedimentation in adjoining watercourses. Steep slope environments often support unique plants and wildlife that are part of the region's biodiversity. There are limited, but important areas of the township that contain steep slopes. Figure 5.2 shows the areas of concentrated steep slopes greater than 15 percent. Undeveloped areas of the township in the panhandle and in Oreland containing significant steep slopes should be considered for open space preservation.



Woodlands and hedgerows serve many purposes, both functional and aesthetic. A functional definition of woodlands incorporates both forestry management and landscape planning. Woodlands comprise one or more acres of forested land where the largest trees measure at least six inches in diameter at breast height (dbh), or a grouping of trees forming a canopy where 10 or more trees measure at least 10 inches in diameter at 4.5 feet from the ground.

Woodlands are an important part of the hydrologic cycle for their ability





Woodlands along Sandy Run Creek

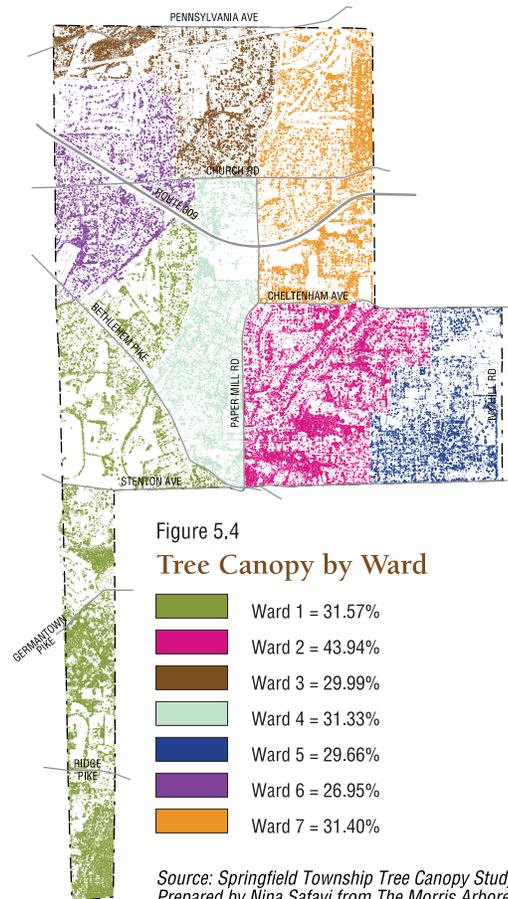
to capture, transpire, and evaporate significant amounts of rainfall that would otherwise become stormwater runoff. They protect steep slopes and other lands from accelerated erosion and the resulting sedimentation of streams. Woodland corridors and hedgerows provide essential habitat for wildlife including food, shelter, and cover for migration. Important remaining woodlands in the township are shown in Figure 5.3. Those found in the panhandle including the Morris Arboretum and the lower panhandle are considered to be ecologically of highest value and described in more detail in the section on the Natural Areas Inventory of Montgomery County below.

### Tree Canopy Cover

Community forests provide a wide range of environmental benefits to communities that go beyond their aesthetic value. Air pollution mitigation, stormwater runoff reduction, absorption and storage of carbon, moderation of the heat island effect, energy conservation through shading, and the visual aspects of landscaping enhancements are all benefits of urban forests.

In 2003 the US Forest Service released the results of American Forest’s “urban ecosystem analysis” of the Delaware Valley. The five-county region was found to have suffered an 8 percent loss of tree canopy cover that over time translates into an increase in stormwater runoff, loss of air quality and an increase in energy costs. The study recommends that all metropolitan areas incorporate tree canopy cover into planning and community development by setting goals for community tree cover. For townships like Springfield, the study generally recommends establishing a minimum goal of twenty-five percent tree cover.

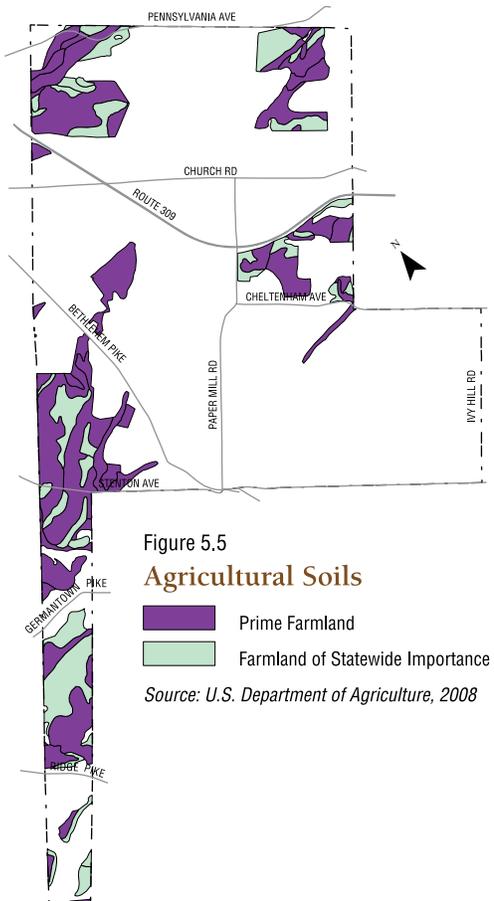
Springfield Township is a designated Tree City, USA, sponsored by the Arbor Day Foundation in cooperation with the USDA, Forest Service. The township has an active Environmental



Advisory Committee, a Shade Tree Committee, and is home to the Morris Arboretum of the University of Pennsylvania, recognized experts in botany, horticulture and landscape maintenance.



Morris Arboretum of the University of Pennsylvania



### Soils

The composition of soils changes slowly over time, due to weathering of rock, hydrology of the area, and the activity of soil organisms. The agricultural capacity of soils varies with respect to depth to bedrock, depth to ground water, color, mineral characteristics, fertility, texture, erodibility and slope. Soils are classified as prime agricultural soils, soils of statewide importance, and other lands, based on these characteristics. Prime agricultural soil includes deep, well drained, and moderately sloped soils that can support a high yield of crops with little management.



Soils of statewide importance include soils that support cultivation but require careful crop management.

Figure 5.5 shows the prime agricultural soils and soils of statewide importance. Many of these areas remain undeveloped including golf courses and sites located in the panhandle. Despite the existence of important soils in the township, there are presently no active sites used for agricultural activities.

## Surface Water and Hydrology

Most of the water in the township streams and water bodies originates as surface runoff or ground water. The average annual rainfall in Springfield Township is 43.8 inches. Generally speaking, 25 percent of rainfall becomes runoff, 25 percent is absorbed into the ground, and nearly 50 percent is evaporated or transpired by plants.

Virtually all Springfield's land area drains toward the Schuylkill River, with a small portion draining toward the Delaware River. Township streams include the Wissahickon Creek and the Sandy Run Creek. The township also has three ponds located in Mermaid Park Cisco Park and Sandy Run Park. These ponds serve as habitat and water source for wildlife, storage areas for stormwater, and create community focal points for recreation.

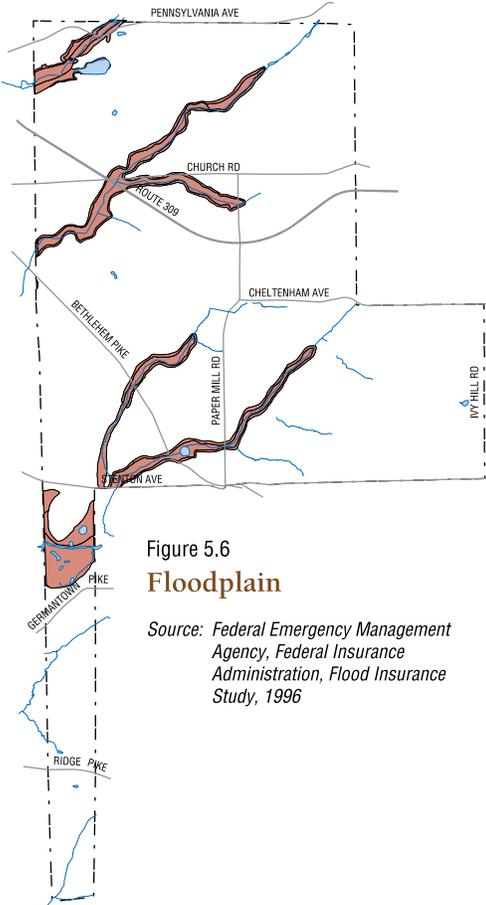
Groundwater behaves much like surface water, flowing like a stream only much slower. As land cover changes, the various "routes" that stormwater takes changes. Loss of infiltration greatly effects ground water recharge and base flows in streams. While Springfield has areas with nature land cover and rural landscape, both with 20 percent or less impervious coverage, the dominant land use in the township is a suburban/urban landscape that is 35 percent or more impervious coverage. The suburban landscape areas of the township can be expected to provide 30 percent surface runoff, 35 percent evapotranspiration, 20 percent shallow infiltration, and only 15 percent deep infiltration.

## Flood Plains

Over 250 acres in Springfield Township are located within the 100-year flood plain as designated by the Federal Emergency Management Agency (FEMA, 1996). Most are found along the Sandy Run Creek, Wissahickon Creek, Paper Mill Run and St. Joseph's Run.

Water that breaches the banks of streams during rain events spread out onto floodplains. In their naturalized state, floodplains store and convey floodwaters and allow faster moving stormwater to slow down and infiltrate into the soil. Well vegetated stream and floodplain corridors will reduce pollutant loads to streams, provide shade and wildlife habitat. The condition of the stream bank vegetation is especially important along feeder streams or headwaters, and they play a vital role in mitigating the potential downstream impacts





**Figure 5.6  
Floodplain**

Source: Federal Emergency Management Agency, Federal Insurance Administration, *Flood Insurance Study, 1996*

of stormwater, including reducing erosion, sedimentation, velocity and temperature, key aspects of stream water quality.

Development within the floodplain reduces the carrying capacity of the floodplain and heightens the destructive ability of stormwater. Historically, the township has suffered flood damage during severe storm events occurring in 1996, 1999, 2001, and 2004. Areas of the township that have experienced repeated flooding include: the Oreland Run section of Sunnybrook Creek including parts of Oreland Mill Road, Lorraine Avenue, Lyster Road, and Hemlock Road; and the Enfield sections of Sunnybrook Creek at Quill and Lantern Lanes. The township has developed a stormwater improvement

plan to address these issues. A number of the stormwater projects are highlighted in the chapter on community facilities and services.

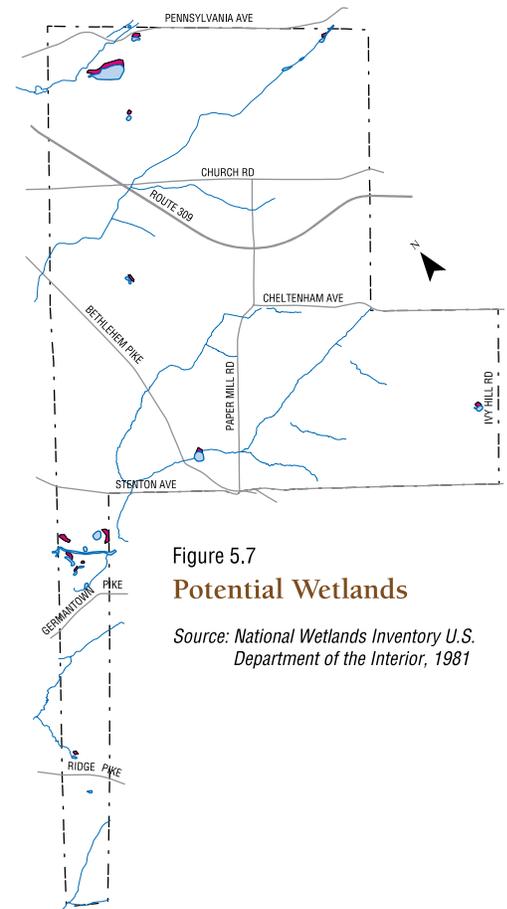
### Wetlands

Wetlands provide habitat for birds, amphibians and fish. These in turn support other wildlife. Wetland areas help to mitigate flooding by holding stormwater and providing areas for flood water to spread out and decrease in velocity. Similar to riparian buffers when water flows through the wetlands, sediment loads drop out of the stream, are filtered, and taken up by wetland vegetation. Wetlands can encourage infiltration of stormwater and contribute to ground water recharge.

Figure 5.7 shows potential wetlands located near flood plains found along the Sandy Run Creek and the Wissahickon Creek.

### Watershed Protection

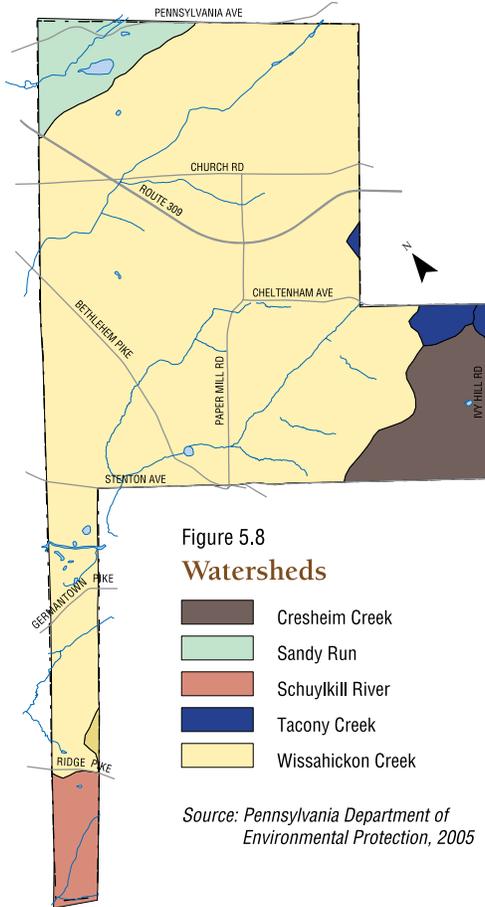
Township lands are located in five watersheds shown in Figure 5.8. The largest is the Wissahickon watershed which also drains areas of Upper Dublin, White Marsh,



**Figure 5.7  
Potential Wetlands**

Source: National Wetlands Inventory U.S. Department of the Interior, 1981





Whitpain, Lower Gwynedd, and North Wales. Due to the interrelationship that exists between communities a watershed by virtue of their relationship upstream or downstream, each township should aim to maintain a naturalized condition along its drainage areas to protect the water quality of its downstream neighbor.

## Natural Areas Inventory

According to the 2007 Natural Areas Inventory Update of Montgomery County (NAI), Springfield's lower panhandle is located in the *Lower Schuylkill River Conservation Landscape (LSRCL)*. The Springfield portion of the LSRCL includes an area that contains many natural features. The valley of Manor Creek is a corridor extending from the uplands near Ridge Pike to the Schuylkill River. The mostly forested tract includes the headwaters of the Manor Creek. The 102-acre Shelly Ridge Girl Scout Reservation is the largest parcel of open space on the east side of the river in this landscape. The Shelly Ridge forests include several mature stands of red oak. Red oak, black oak and American beech are the dominant canopy tree species. Severe browsing by deer has eliminated most of the understory and shrub layer of the forest although spicebush, white bane, jack-in-the-pulpit and yellow and blue violets remain.

The NAI provides general recommendations for the conservation landscapes includes protection of large uninterrupted forested areas; protection of riparian corridors from headwater areas to the main stem of creeks; sustainable public and private land management practices, and public education, interpretation, and further study of the Lower Schuylkill River Conservation Landscape.

In Springfield, the unprotected portion of the LSRCL (Figure 5.9) contains 7.46 acres of relatively intact and undisturbed natural features including; 5.49 acres of woodlands, 5.84 acres of steep slopes of 15 percent or greater; and two significant soil types. Manor loam (MaE) is the predominant soil type, making up 4.73 acres. Manor loam tends to be a thin soil layer forming on steep slopes that is easily eroded when the vegetative cover is removed. Hydric soils (HA) makes up 1.7 acres and is typically found along stream corridors.

## Open Space Value

Springfield enjoys nearly 623 acres of combined open space that includes public and private open space. Permanently protected open space refers to land preserved for active and passive recreation and for conservation purposes. In addition to





Piszek Tract

township-owned lands, it may include land preserved by private conservation programs, and private open space preserved as part of a land development. Permanently preserved open space limits future development and provides permanent resource protection. Temporary open space also make an important contribution to the overall recreation base of a community by providing open space, sheltering significant natural resources, and providing recreation facilities that do not require municipal resources for maintenance.

Springfield’s 2005 Open Space Plan identified unprotected open space resources and high priority areas of the township for preservation. The highest priority areas are the Piszek & Boorse Tracts for their woodlands, prime agricultural soils, their scenic views, and their adjacency to township open space (Sandy Run Park); and most of the panhandle for the sensitive environmental features such as woodlands, steep slopes, prime agricultural soils, and adjacency to the Wissahickon Valley and the Andorra natural areas.

High priority areas included Laverock Hill (Hope Starr Lloyd), the Karr Tract (LaSalle High School), and the three country clubs for the prime soils, adjacency to public or institutional open space, or historical significance. Priority areas include the Erdenheim Farm (recently permanently preserved), the Carson Valley School, and Mount St. Joseph’s school for their prime agricultural and hydric soils, scenic vistas, and adjacency to existing open space.

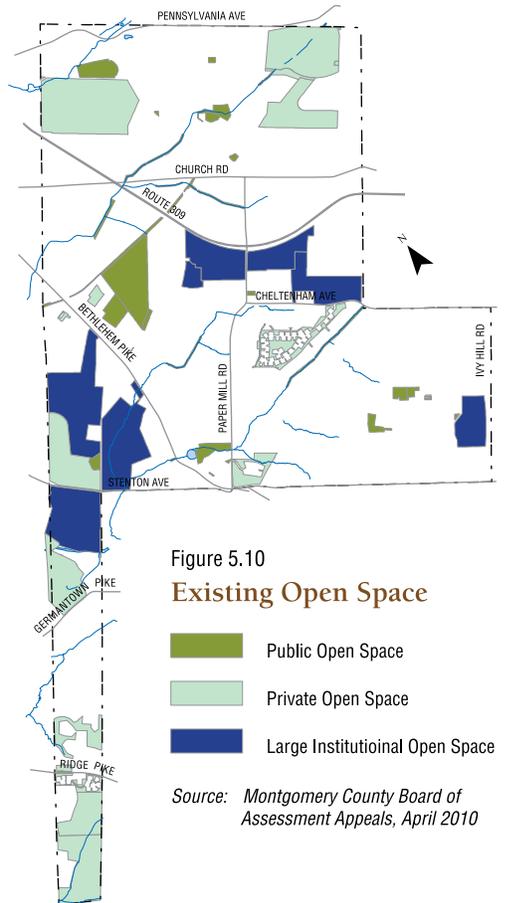


Figure 5.9  
NAI Public and Protected Lands  
Lower Schuylkill River Conservation Landscape

- Conservation Landscape
- Private Open Space
- Municipal Open Space
- County Open Space
- Fairmount Park

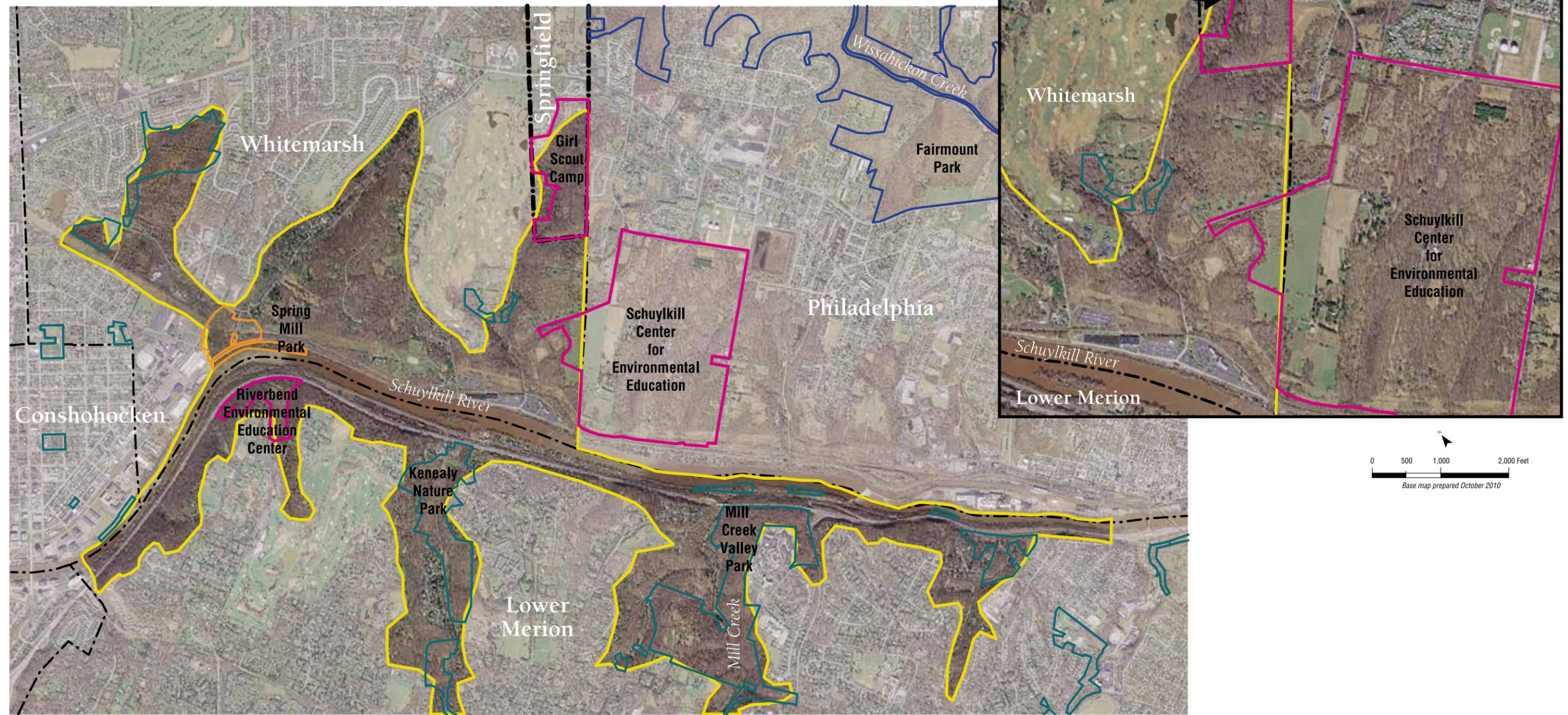
Source: Montgomery County Board of Assessment Appeals, April 2010

**Unprotected Open Space**

7.46 acres = Total Unprotected Land  
 5.46 acres = Woodlands  
 5.84 acres = Steep Slopes of 15% or greater

**Soils**

4.73 acres = MaE (soils found on steep slope)  
 1.7 acres = HA (hydric soils)



0 500 1,000 2,000 Feet  
 Base map prepared October 2010

0 900 1,800 2,700 3,600 Feet  
 Base map prepared October 2010



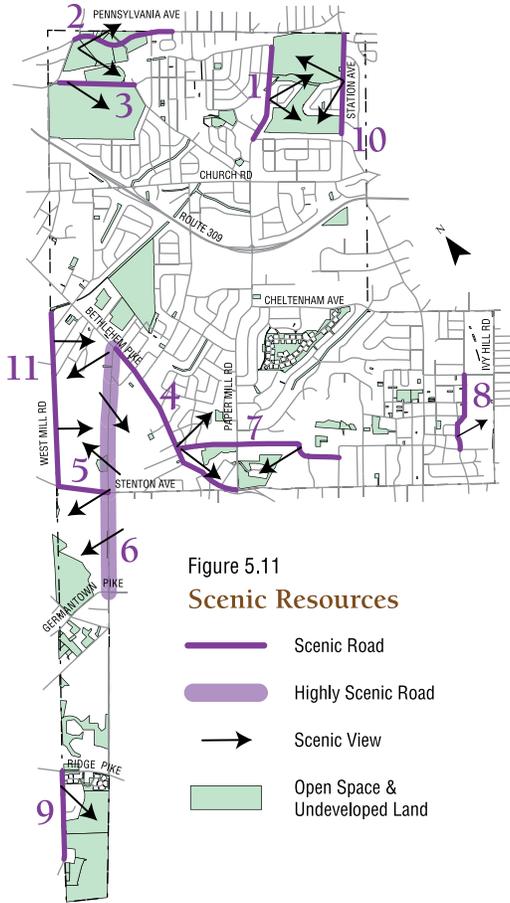


Figure 5.11  
**Scenic Resources**

-  Scenic Road
-  Highly Scenic Road
-  Scenic View
-  Open Space & Undeveloped Land

## *Scenic Roads and Vistas*

Scenic resources are elements of the natural and/or built environment that stand out among all the attributes of a community. They tend to be the most pleasant and interesting places, such as historic sites, natural features like lakes or creeks, and recreation areas.

Although the process of identifying a scenic resource is largely dependent on the observer’s own opinions and preferences, information collected from a community group, such as a planning commission, can provide a relatively broad inventory. Wherever possible, these areas should be preserved and linked to the community’s open space and recreation system. Scenic resources in Springfield are summarized below under the combined heading of roadways and views and are mapped in Figure 5.11. The defining element or feature for each resource is noted.

Roadways with scenic attributes contribute to a community’s open space system because they provide a way to view its scenic resources and in some cases also serve as recreation routes for walkers, bicyclists, and joggers. A number of such roads exist in the township.



Figure 5.12

**Scenic Places**

|   |
|---|
| <b>1 Paper Mill Road – Edann Road to Bruce Road</b>   |
| This road segment takes the traveler past North Hills Country Club, one of the township's major open space areas. The view this provides should be protected.                                   |
| <b>2 Pennsylvania Avenue – Camp Hill Road to Lynn Avenue</b>  |
| Scenic views of private open space (Boorse/Psizek properties) exist along both sides of this winding road.  |
| <b>3 Walnut Avenue – Camp Hill Road to Oreland Mill Road</b>  |
| This road provides views across parts of Sandy Hill Country Club, one of the township's major open space areas.   |
| <b>4 Wissahickon Avenue – Bethlehem Pike to Stenton Avenue</b>  |
| This is perhaps the township's most scenic road, taking the traveler into a significant open space corridor (comprised of Carson and St. Joseph's schools, Dixon farm and the Morris Arboretum) |
| <b>5 Stenton Avenue – Whitmarsh Township to Northwestern Avenue</b>   |
| With Morris Arboretum to the south and Erdenheim farm to the north, this stretch of Stenton Avenue has an open, rural feel.   |
| <b>6 Northwestern Avenue – Stenton Avenue to Andorra Road</b>   |
| In terms of its scenic value, this road functions as an extension of Wissahickon Avenue, continuing the quality views into private open space.  |
| <b>7 Montgomery Avenue – Bethlehem Pike to Evergreen Avenue</b>   |
| This road provides scenic views of open space in Cisco Park and the Biddle Woods area across Paper Mill Road.   |
| <b>8 Mermaid Lane – Stenton Avenue to Queen Street</b>  |
| This part of Mermaid Lane passes through a residential area that has pleasant shade tree cover. It is also adjacent to Mermaid Park, one of the township's main public open space areas.        |
| <b>9 Manor Road – South of Ridge Pike</b>   |
| Manor Road serves the most undeveloped area of the township, taking the traveler past a dense area of woodlands and adjoining open space.   |
| <b>10 Station Avenue</b>  |
| This section of Station Avenue passes through a shaded residential neighborhood with North Hills Country Club on the north side of the road.  |
| <b>11 West Mill Road</b>  |
| This section of West Mill Road provides scenic views of the Morris Arboretum to the east.   |

## Natural Resource Protection Goals

Protect and preserve sensitive environmental features such as waterways, wetlands, watersheds, streams, woodlands, open spaces, slopes, soils, and natural habitats.

### Objectives

1. Create a natural resource inventory and assessment. Identify priorities and actions.
2. Ensure that the updated subdivision and land development ordinance standards exceed the current NPDES permit requirements.
3. Plan for and implement a coordinated open space network including stream corridors, parks, and green infrastructure.



4. Develop a robust tree planting program.
5. Develop strategies to preserve and protect open space (i.e. SRCL in the lower panhandle, acquisition of development rights).
6. Educate and promote the benefits of a Riparian Corridor Ordinance.
7. Participate in regional and watershed-based technical and steering committees.
8. Encourage voluntary water conservation and anti-pollution measures throughout the township.

