

Water Quality Regulation and Stream Classification

The Department of Environmental Protection has developed antidegradation water quality standards for all surface waters in the Commonwealth. These standards, which are designed to safeguard the streams, rivers, and lakes throughout Pennsylvania, include water quality designations and associated water quality regulations necessary to protect the existing quality and ecology of the streams and water bodies and their use for water supplies and recreation.

Ponds and Lakes
 Many private ponds and lakes of various sizes are found in Franklin Township including:
 • Cummings Pond
 • Lake Catalpa
 • Lake Louise

All of the streams in the Township are classified as cold water fisheries, except the headwaters of Lake Catalpa which are classified as high quality, cold water fisheries. Special protection beyond basic standards is provided for streams designated as high quality waters. High quality streams are those that have excellent quality waters and environmental or other features that require special protection. Wastewater treatment plant effluent and any other discharges to streams classified as high quality are only permitted by DEP if the discharge is the result of necessary social and economic development, water quality standards are maintained, and all existing uses of the stream are protected. This has the effect of requiring all wastewater treatment plants to provide tertiary treatment to meet discharge criteria. In addition, DEP allows stream discharge only if soil based disposal alternatives are not feasible.

Surface Water Quality

Surface water quality in the Township remains generally good but can be affected by point and non-point pollution. Non-point sources include runoff from development and agriculture and on-lot sewage disposal systems, and point sources include direct stream discharges of sewage effluent and stormwater.

Planning Implications: Watersheds and Surface Waters

- Maintaining good water quality is critical to the quality of life in the Township and region and beyond to Chesapeake Bay. Good quality streams and well-conserved watersheds are a good measure of overall environmental quality.



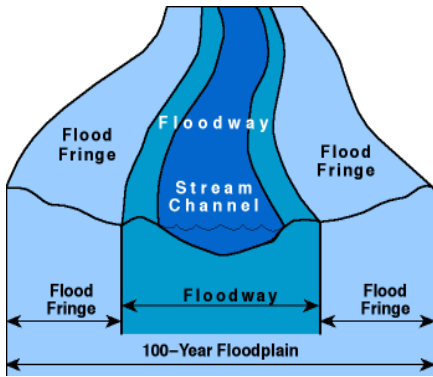
Lake Louise



- In order to protect the good water quality development should be carefully managed. The balance between good water quality and future growth and development will require meticulous consideration to weigh the impact on water quality against the need for economic growth, and the added expense for water quality protection technology against the need to protect water quality.
- State and federal regulations go a long way to protect water quality, but local municipalities often adopt additional standards such as buffers and conservation subdivision design to afford additional protection.
- The clearing of vegetation on steep slopes and along streams during the development process and for agriculture increases the potential for surface run-off, erosion and siltation, and downstream flooding.
- Excessive stormwater runoff introduces pollutants into the stream system, increases peak flows, damages stream banks and increases downstream flooding.
- Continued updating and enforcement of on-lot sewage disposal, stormwater and soil erosion control and other water quality regulations is critical.

Floodplain

During the period of early settlement and later development of most regions, waterways played a key role as transportation routes and later as a source of power for operating grain mills, sawmills, and other industries. In addition, the land located along streams and rivers was conducive to development - soils are generally fertile for agriculture and the terrain relatively level, facilitating the construction of roads and buildings. Those stream-side areas often developed into settlements and then expanded as the population grew. However, an often unanticipated problem with river/stream valley settlement is flooding. As development continued and natural drainage patterns were altered, increases in stormwater run-off heightened the potential for flooding and property damage.



Floodplain Cross Section

Floodplain Regulations

Both the state and federal government now administer programs for flood control and flood plain development and provide certain regulatory standards which local municipalities must adopt in order for property owners to be eligible for flood insurance. Minimum state and federal requirements allow dwellings in the floodplain if the lowest floor is elevated at least 1.5 feet above the 100-year flood elevation and nonresidential structures if flood-proofed or elevated. The Pennsylvania Flood Plain Management Act (Act 166 of 1978) requires local municipal participation in the flood plain management program, or state funding allocations such as Liquid Fuel Funds can be withheld.

Franklin Township floodplain regulations, which were recently updated, comply with the state and federal minimum by requiring elevated dwellings and floodproofed nonresidential structures.

Floodplain Maps

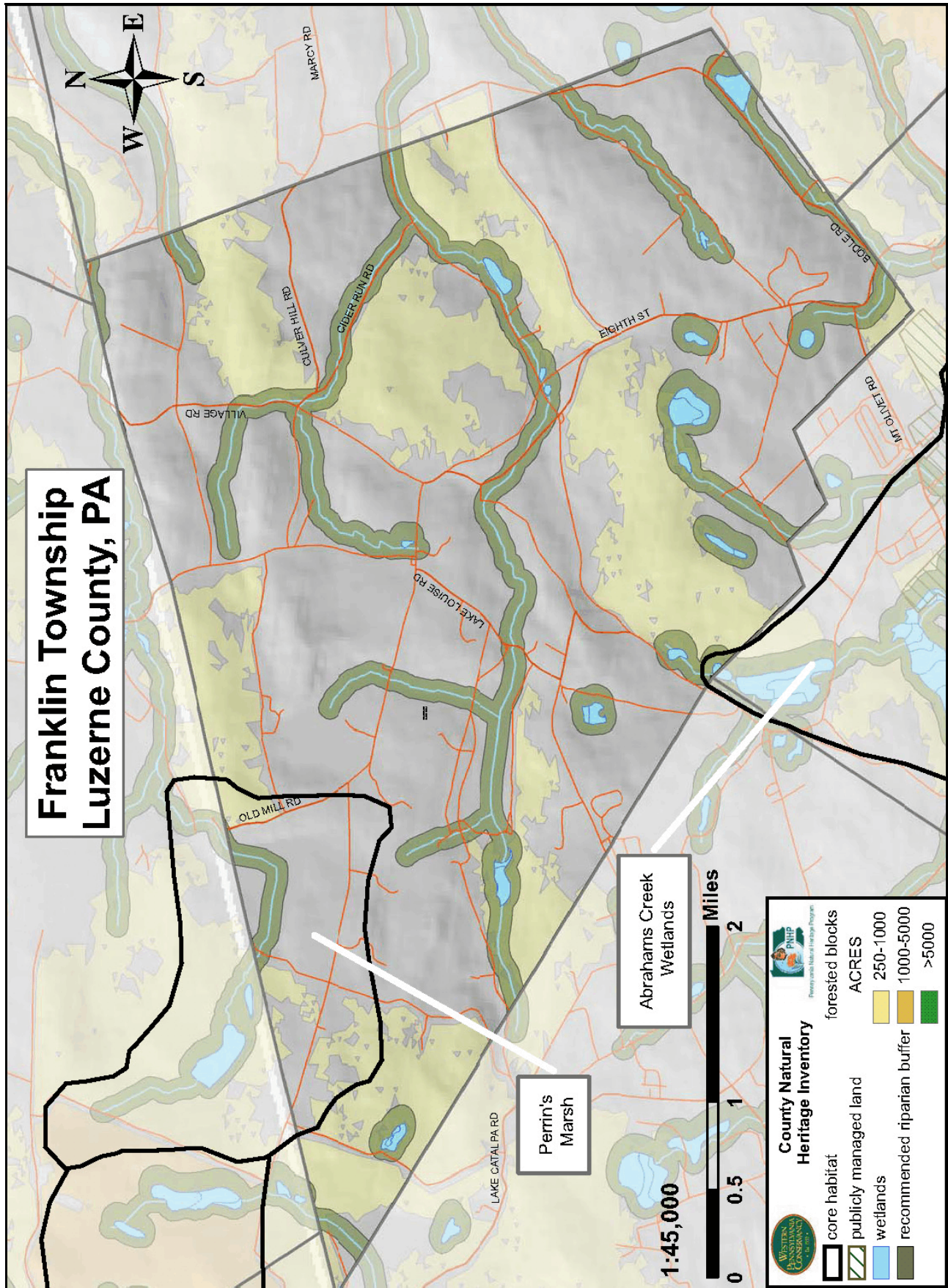
The National Flood Insurance Program is administered by the Federal Emergency Management Agency (FEMA) which also has prepared and issued the maps which identify flood prone areas throughout the Country. (See the *Natural Resources Map*.) Flood hazard areas are identified for the *100-year flood* which is a flood event of a magnitude which is expected to be equaled or exceeded once on the average during any 100-year period. This is a long term average period between such floods and such floods can occur at shorter intervals or conceivably in the same year. Areas of 500-year floods and 100-year floods of less than 1-foot depth are also shown.

Township Flood Zones

The 100-year floodplain identified by FEMA in the Township is minimal and is largely confined to narrow corridors along Sutton Creek and its tributaries. (See the *Natural Resources Map* which accompany this Plan.) Development in floodplain in the Township is also very minimal when compared to many communities, and damage from floods has been infrequent.

Natural Areas

The Township’s expanses of forest cover, prevalence of wetlands, and surface water features provide diverse habitat for an abundance of plant and animal species. The 2006 *Luzerne County Natural Areas Inventory*, identified two areas in Franklin Township – about half of Perrin’s Marsh and the upper extreme of Abrahams creek Wetlands. (See the following map and narrative from the *Inventory*.) The *Inventory* was compiled by the Pennsylvania Natural Heritage Program of the Western Pennsylvania Conservancy, documents the significant natural areas in the County and the location of known animal and plant species of special concern (endangered, threatened, or rare). The inventory also identifies areas that represent good examples of habitat types that are relatively rare or that provide exceptional wildlife habitat. The purpose of the inventory is to guide planning and conservation efforts and to assist in prioritizing areas to be protected.



ABRAHAM’S CREEK WETLANDS (Dallas, Franklin & Kingston Twps.) -UPDATE- SA504, SA505A, & SA505B - The site consists of creek-side wetlands impacted by flooding from the damming of the creek downstream in Francis Slocum State Park. Two animal species of concern (SA505A & SA505B) occupy a herbaceous wetland where the creek enters the reservoir, and another species of concern (SA504) breeds in a flooded forested wetland to the north. More habitat data is needed on this site, but the species of concern have been recorded using the site for several years. The preservation of large trees is important to SA504. Maintaining the water quality of Abraham’s Creek and stable water levels during the growing season will benefit the species of concern. A good population of a plant species of concern, Soft-leaved Sedge (*Carex disperma*) was located at this site in 2003. Associated species include *Carex pensylvanica*, *Maianthemum canadense*, *Mitchella repens*, *Carex digitalis*, *Uvularia perfoliata*, *Lycopodium obscurum*, and *Viburnum acerifolium*.

PERRIN’S MARSH (Northmoreland Twp. in Wyoming County and Franklin Twp. in Luzerne County) –UPDATE- SP503A & SA503B - Perrins Marsh is a shallow (1-2 meters deep) man-made pond located on private property on the Wyoming/Luzerne County border. The pond has been dammed for over 50 years. A good-quality population of a PA-Rare plant (SP503A) species was first identified at the site in 1993. The site was revisited in 1999 and SP503A is still present. A new good-quality PA Endangered, S1 plant (SP503B) population was identified at the site during the 1999 visit. This thriving population is the first known occurrence of the plant species in Eastern Pennsylvania. The dominant plant species at this site include spatterdock (*Nuphar variegatum*), hornwort (*Ceratophyllum carolinianum*), watershield (*Brasenia schreberi*), water lily (*Nyphaea odorata*), and pondweed (*Potamogeton sp.*). Perrins Marsh also provides habitat for a diverse population of dragonflies and damselflies. A 1994 survey of the site identified twelve species of dragonflies and two species of damselflies. Eleven of the species were observed for the first time in Luzerne county. Disturbances include a high Canada goose population, but the geese do not appear to be impacting the plant species of concern. The site should continue to be monitored and surrounding locations (e.g., Cummings Pond) should be visited to search for additional populations of these plants of concern and wading bird species of concern. The use of an aquatic herbicide or dramatically changing the water level are the greatest potential threats to the marsh. The plant species SP503B, *Potamogeton robbinsii* (Flat-leaved Pondweed), has been removed from the species of concern list.

**Planning Implications:
Natural Areas**

The Township’s woodland habitat is relatively healthy, as large and diverse areas of vegetation remain. However, steps should be taken to ensure that large contiguous forest communities remain in tact with proper forest management. Wetland and aquatic habitats, and in particular habitats identified by the Natural Areas Inventory, are most at risk from direct development or watershed disturbance. This includes degradation due to encroaching development, agriculture, logging and forestry operations, and contamination from wastewater and stormwater runoff. Protection of habitat and Natural Areas Inventory sites requires a combination of local municipal environmental regulations and state and federal resource management and use regulations. The Township will continue to apply ordinance standards related to environmental resource protection and promote open space protection among landowners via voluntary easements on parcels with Natural Areas Inventory sites.

Forestry

This *Comprehensive Plan* recognizes the historical and continuing importance of forestry enterprises to the local economy and quality of life, and encourages forestry activities throughout the Township provided such operations are conducted in accord with sound forest management practices and environmental regulations. Landowners manage their forests for a variety of reasons including income from timber sales, wildlife habitat, recreation, water quality protection, bio-diversity, and timber for long-term investment. Improper harvesting and management practices often raise stream water quality and other environmental concerns with local residents and local officials. It is critical for public acceptance of forestry, environmental quality and the long-term viability of the industry and forest resources that logging professionals and individual landowners use best management practices when harvesting and for long-term forest maintenance.

The Pennsylvania Municipalities Planning Code (MPC), at §603(c)(7), states that *zoning ordinances may not unreasonably restrict forestry activities* and goes on to

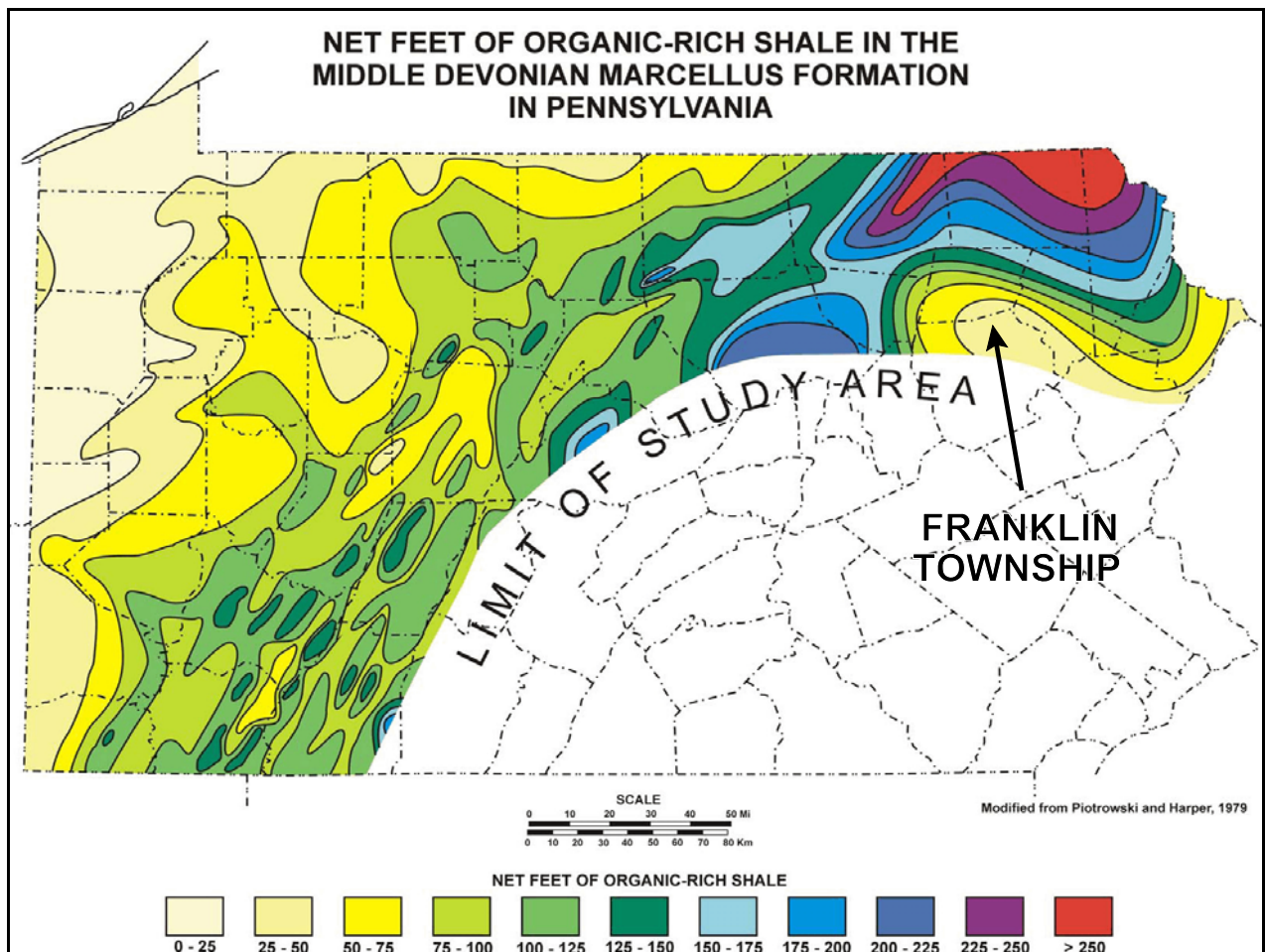


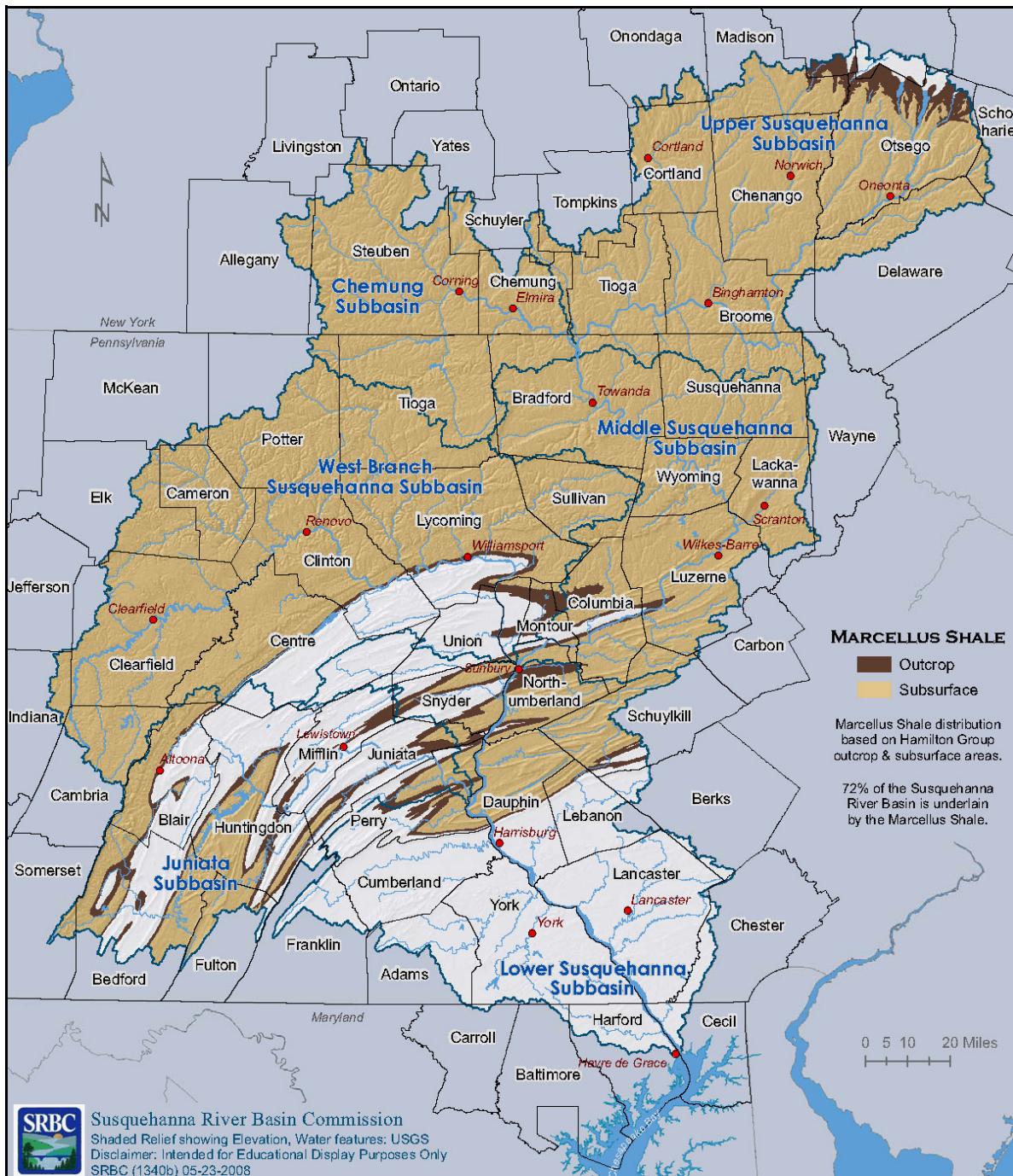
Forestry-Related Business

require that in the Commonwealth, *forestry activities . . . shall be a permitted use by right in all zoning districts in every municipality.* The Code defines *forestry* as *the management of forests and timberlands when practiced in accord with accepted silvicultural principles, through developing, cultivating, harvesting, transporting and selling trees for commercial purposes, which does not involve any land development* (buildings such as sawmills and wood products manufacturing are treated as separate uses). Any zoning provisions will be consistent with the MPC by classifying forestry as a principal permitted use in all zoning districts.

Minerals

This *Comprehensive Plan* recognizes the economic value of the minerals industry while understanding the necessity that the industry operate within the bounds of environmental regulations. The primary minerals of commercial importance extant in the Township are sand stone, which can be mined as quarry stone and dimensional stone, shale, and sand and gravel, and potentially, natural gas. There are no active commercial quarries in the Township. A number of natural gas companies have leased thousands of acres in the Back Mountain Area. If exploratory wells are successful, natural gas extraction may become a part of the landscape. The thickness of the shale and its productivity varies throughout the deposit.





Marcellus Shale in the Susquehanna River Basin

Minerals and the MPC

The Pennsylvania Municipalities Planning Code (MPC) clearly recognizes mineral extraction as a lawful use. Along with other community effects, such uses can have impacts on water supply sources and are governed by state statutes that specify replacement and restoration of affected water supplies. In addition, the Planning Code now severely limits the range of development and operational standards which can be applied to mineral extraction by local municipalities, with location standards the primary tool available to the municipalities. Planning Code §603(I) states that *zoning ordinances shall provide for the reasonable development of minerals in each municipality*. The Code definition of minerals is: *Any aggregate or mass of mineral*

matter, whether or not coherent. The term includes, but is not limited to, limestone and dolomite, sand and gravel, rock and stone, earth, fill, slag, iron ore, zinc ore, vermiculite and clay, anthracite and bituminous coal, coal refuse, peat and crude oil and natural gas. The Code, at §603(b) allows zoning ordinances to regulate mineral extraction, but only to the extent that such uses are not regulated by the state Surface Mining Conservation and Reclamation Act, the Noncoal Surface Mining Conservation and Reclamation Act, and the Oil and Gas Act. These acts regulate such things as setbacks, dust, noise, blasting, water supply effects, and reclamation.

The mineral extraction language in the MPC, coupled with recent court decisions, has severely limited local municipal authority to regulate natural gas extraction. However, the Commonwealth Court has ruled that the Oil and Gas Act regulations do not preclude local municipalities from restricting gas wells to certain zoning districts. The Township must adjust local regulations to evolving court decisions.

This *Comprehensive Plan* recognizes the need to provide for *the reasonable development of minerals* in the Township while at the same time ensuring that such operations are conducted in appropriate locations and in accord with sound mining practices and environmental regulations.

FUTURE PLANNING POLICIES AND ACTIONS

Overview

The following future planning policies and recommendations are measures intended to achieve Franklin Township’s natural resource protection goals. These policy recommendations will guide future decisions and actions related to natural resource protection.

Environmental Protection

Development and environmental protection, as well as conserving open land and natural resources, need not be mutually exclusive. While a clean environment, abundant open land, and natural resources are key elements of the quality of life in the Township, one must recognize that growth is inevitable and can contribute positively to a healthy community.

The goal is to strike a balance between development and preserving the essential character of the Township. Development practices which recognize the importance of the local environment will ensure the continuation of the quality of life that residents enjoy and which is so attractive to new residents. Concurrently, land owners and developers will be able to provide the home sites and businesses that a growing population demands.

The intent is to ensure *environmentally friendly* development within the context of the existing zoning districts. State and federal regulations address many aspects of resource conservation and environmental protection, and these regulations should be the foundation - the base from which local municipal regulations should be built. Local standards must be coordinated with state and federal requirements. In some cases, the zoning ordinance can simply reference the other applicable standards.

Local Authority for Regulation

The Pennsylvania Municipalities Planning Code (MPC) authorizes land use planning and management tools for the Commonwealth’s municipalities. Compliance with the MPC, along with case law, dictates the legality of local regulations. For this reason, it is very important to remember that all land use management tools must be prepared and administered within the bounds of the MPC and current case law. In addition, the

Second Class Township Code provides authorization for special purpose ordinances aimed at protecting public health, safety and welfare. Other state laws, such as the Floodplain Management Act and Stormwater Management Act, mandate local regulation of resources. In all cases, the municipal solicitor should be involved in reviewing any changes to municipal plans and ordinances.

Integrated Approach

Given the range of authorizing state statutes, municipal open land, natural resource and environmental regulations are typically found throughout a number of ordinances. While this may appear problematic at first glance, the integration of such standards in various ordinances is important because a certain ordinance may govern one type of development while another governs a different type. For example, the subdivision and land development ordinance governs how land is divided and improved while the zoning ordinance governs the specific uses on the land. In some cases a special purpose ordinance may be more effective than including standards in the zoning ordinance. The important point is consistency of standards in all ordinances.

Township ordinances include a broad range of environmental standards. Each Township will periodically review and update its environmental standards to ensure the most effective protection. The possible range includes:

- Environmental impact analysis requirements for large scale and environmentally problematic uses.
- Retention of existing vegetation on development sites and soil stabilization and landscaping.
- Stream, lake and wetland buffers.
- Stormwater best management practices including quality treatment and infiltration.
- Floodplain management.
- Hydrogeologic studies for proposed uses with large groundwater consumption.
- On-site sewage disposal system management.
- Limitations and special standards for development on steep slopes.

Topography and Geology

Preservation of topographic and geologic features is important for maintaining natural drainage patterns, slope stability, erosion control, and surface and groundwater quality. The following policy recommendations are intended to promote the protection of these features:

- The preferred approach is conservation design which sets steep slopes aside as conservation areas.
- Strictly limit site disturbance of steep and very steep slopes – tree and vegetation removal, soil removal, grading.
- Exclude a percentage of steep slope areas from lot area determination.
- Limit the use of very steep slopes to open space and passive recreation.

- Prohibit buildings or structures on very steep slopes.
- Establish design and performance criteria for buildings or structures on steep slopes including submission of detailed site, grading and drainage plans.
- Set a maximum building envelope size.
- Limit final slopes of cuts and fills to 50%.
- Preserve rock outcrops and unique geologic features.

Improving Stormwater Management

Development projects are subject to a number of state and federal water quality standards that relate to stormwater management. Significant changes have recently been instituted in state requirements. Any inconsistency between local and state requirements and county planning may result in project delays as applicants face conflicting design standards. In order to ensure that local stormwater management standards are consistent with State water quality antidegradation requirements, Act 167 (Stormwater Management Act) and Federal National Pollutant Discharge Elimination System (NPDES) requirements for stormwater discharges associated with construction activities stand-alone stormwater ordinances should be adopted.

Preserve Existing Hydrologic Conditions

The key is to promote development practices to minimize post-development runoff rates and volumes and the need for artificial conveyance and storage facilities.

- Preserve natural drainage features such as vegetated drainage swales, channels, valleys, or depressions where water normally ponds.
- Minimize earth disturbance and preserve natural vegetation to the greatest extent possible by conforming plans to existing topography.
- Minimize impervious surfaces to the maximum extent possible.
- Disconnect impervious areas by directing runoff to areas where it may either infiltrate into the soil or be filtered through vegetation.

Maintain Groundwater Recharge

Simple provisions are critically important in areas where groundwater use is increasing dramatically and stormwater is too often simply considered a problem.

- Require the use of infiltration to provide groundwater recharge whenever possible in recognition of stormwater as an important resource to maintain groundwater supplies.
- Ensure that any infiltration does not pose a threat to groundwater quality.

Maintain Water Quality

Measures to prevent degradation of surface water quality from pollutants carried in stormwater discharges, such as vegetative filter strips, infiltration basins, bioretention areas and wet detention ponds, are important.

Reduce Erosion and Stream Scouring

As storm flows increase, the velocities in streams increase. Both the volume and rate

of stormwater discharges should be managed to prevent physical degradation of receiving waters, such as stream bank erosion and channel scour.

Control Flooding

Flooding and stormwater problems are caused by excess stormwater quantity. While some over-bank (typically 2-year to 10-year storm events) and extreme (25, 50, and 100-year) flooding events are inevitable, the goal of stormwater management standards is to control the frequency of occurrences so that damages to existing infrastructure are not exacerbated by upstream development.

Inspection and Maintenance

Without regular inspections during construction and proper and long term maintenance, stormwater infiltration devices, detention basins, pollution control and other facilities will not function properly, often with problematic or even disastrous downstream effects. Even the addition of homes within a residential subdivision can have serious effects on neighbors if facilities are inadequately constructed and maintained.

- Include standards to address inspection during construction, long term ownership, maintenance agreements for privately owned stormwater facilities and specific maintenance schedules.
- Make the failure to maintain any facility an ordinance violation and to provide the authority for enforcement and correction.

Groundwater Conservation and Protection

Methods available for local municipalities to conserve the groundwater supply and protect quality are well documented, and have been successful in many areas of the Commonwealth. Details of available methods, the authority for action, and sources of assistance are detailed in *Groundwater Protection and Management in Pennsylvania*.¹ The Report recommends the following five-step process to develop and put into place an effective groundwater protection program:

- Involve the community by organizing a committee of interested individuals from the community, and neighboring communities, if appropriate.
- Determine sources and uses of the community's water supply and define the proposed groundwater protection areas.
- Identify possible contamination sources-past, present, and future-in the groundwater protection areas.
- Establish goals and priorities based on an evaluation of the groundwater threats.
- Implement appropriate management measures, including plans for future needs.²
- Sponsor an annual well water testing program and compile and map the results.

¹*Groundwater Protection and Management in Pennsylvania, An Introductory Guide for Citizens and Local Officials*, League of Women Voters of Pennsylvania Citizen Education Fund and Water Resources Education Network Project, R. Merideth, J. R. Drohan, C. W. Abdalla, J. R. Jessen, E. D. Stevens, 2001, Third Edition.

²*Ibid.*, p. 13.

In addition to evaluating the applicability of the five-step formal planning process, other local municipal actions may include:

Zoning

- Link dwelling unit densities to the quality of the land by identifying environmentally sensitive areas as part of the development process.
- Include standards for identification and protection of environmentally sensitive areas – recharge areas, floodplain, steep slopes, wetlands, riparian buffers, etc. – and update as necessary.
- Provide incentives for conservation subdivision design where full development density is permitted, individual lot sizes are reduced, a certain percentage of open space is set aside, and sensitive natural areas are preserved.
- Allow conservation design development and transfer of development rights as a way to shift development away from sensitive environmental areas.
- Require a hydrogeologic study for any proposed use which will withdraw large quantities of groundwater.
- Require detailed water quality protection plans for any commercial or manufacturing use which have the potential for groundwater contamination.
- Adopt well head protection standards that limit potential contaminating activities in zones around community wells.

Sewage Enforcement

- Continue the strict enforcement of the on-lot sewage disposal program.
- Consider establishing an on-lot sewage system management program.

Stormwater Management

- Require stormwater infiltration as the option of choice to maximize groundwater recharge.
- Address stormwater quality (nutrient and pollutant removal) along with quantity.

Well Construction and Protection

The Township should consider the adoption of a well ordinance because there is no state regulation for the construction of private wells. The ordinance would require permits for drilling and making major repairs to water wells. One of the most critical provisions would be to establish a 100-foot isolation distance from sewage disposal fields and a 50-foot setback from septic tanks because state law, while requiring sewage fields to maintain the 100-foot isolation distance from wells, sets no converse minimum. The well ordinance should also:

- Require isolation distances from other potential contamination sources such as buildings, driveways, sewer lines and underground petroleum storage tanks.

- Specify casing size, material, length and height above grade.
- Require a well cap and casing grouting.
- Set minimum water quantity and quality standards and require testing.
- Require bacterial testing for all new wells with a report submitted to the municipality and disinfection prior to use.
- Require all water users located within the service area of a central water supply system to connect to such system except where the applicant provides documentation that the central system cannot provide an adequate and safe supply.
- As a means of building a data base, requiring well drillers to submit copies of the State Water Well Completion Report which includes details about new wells – depth, depth to water bearing zones, static level, yield, and type of aquifer.

Soils

Soils play an important role in the hydrological cycle, allowing infiltration of stormwater and recharge of groundwater sources, and are important determinants of vegetation type and cover. Soils can also inhibit development due to wet conditions (hydric and seasonal high water table soils are not suitable for development) or due to unsuitability for on-lot sewage disposal. Policy recommendations aimed at preserving soils and promoting sound development are as follows:

- Strictly limit soil removal, especially on steep and very steep slopes.
- Limit building on hydric soils and seasonal high water table soils.
- Continue enforcement of on-lot sewage regulations to ensure proper location and installation of on-lot sewage systems.

Soil Erosion and Sedimentation Control

Pennsylvania DEP Chapter 102 and other regulations administered through the County Conservation Districts govern soil erosion and sedimentation control. A plan is required for any earth disturbance in Special Protection Watersheds regardless of size.

- There is no need to include detailed design standards for specific soil erosion controls in either the SALDO or the zoning ordinance.
- The key is to require an approved soil erosion and sediment control plan in the SALDO as a condition of preliminary plan approval for all major subdivisions and all land developments, and in a zoning ordinance for any use involving earth disturbance.

Forest and Vegetation

Maintaining natural vegetation not only preserves rural character, but also has numerous environmental benefits, not the least of which are reducing stormwater, preserving surface water quality and air quality, and maintaining groundwater recharge. The best approach is to set specific standards for maintaining natural vegetation and require the developer to show why the existing vegetation within prescribed setback or buffer areas, and the entire parcel for that matter, cannot be maintained to the greatest extent possible.

- Include specific standards in the SALDO to govern preservation and replacement of vegetation during the development process.

- Also include standards in the zoning ordinance to manage development activities which are not governed by the SALDO; clearing for a parking lot for example.
- Prohibit clearing of vegetation until a land development plan is approved. In the zoning ordinance the section should be written to limit timber harvesting in the buffer to selective cut only in accord with a forestry management plan so as not to preclude reasonable forestry enterprise on the balance of the tract.
- Protect dense and mature forested areas especially on steep and very steep slopes, along stream courses, and in headwater (first order) drainage areas.
- Protect the diversity of vegetative cover and native plant communities.
- Promote the establishment of large contiguous areas of permanently protected forests.
- Encourage the use of native species and prohibit the use of invasive plants.
- Participate in County and State forest pest suppression programs.
- Permit forestry in all zoning districts and encourage the use of best management practices as a means of sustaining forest land

Wetlands

Wetlands provide unique habitat and serve as important groundwater recharge areas, filtering water before it enters an aquifer. Wetland buffer areas are necessary to ensure proper filtration of runoff prior to its entry into the wetland system. Buffers also diminish the opportunity for degradation of the wetland itself, and provide edge habitat for transitional wetland species.

- Prohibit disturbance of wetlands and within an established wetland buffer area.
- As part of all development applications, obtain detailed wetland data that identifies wetlands that are not captured by the NWI.

Watersheds and Surface Waters

Protection of watersheds is imperative for ensuring a safe and sufficient water supply and maintaining water quality. Healthy stream ecology relies upon certain water quality levels and stream flows and streams should be protected from pollutants, high sediment loads, stormwater runoff, and excessively low base flows.

Local policies that protect individual natural features, including steep slopes, soils, forests and vegetation, wetlands, and floodplain, also advance the health of watersheds and streams, and more specifically, support the State's anti-degradation policies. In addition to policy recommendations related to the protection of these individual features, the following apply:

- Prohibit disturbance within an established riparian buffer surrounding streams and other surface water bodies.
- Limit the extent of impervious cover and promote the use of pervious materials.
- Require comprehensive stormwater management that incorporates alternative systems and methods, including Best Management Practices (BMPs), stormwater recharge techniques, and control of non-point source pollution.

- Integrate utilities and development planning: Water supply and wastewater systems are an important part of watershed planning, affecting water balances and overall watershed health. A coordinated growth pattern, where development is directed to areas that have existing sewer and water infrastructure, or are programmed to have such infrastructure, will help to safeguard water supply and quality.

Floodplain

Floodplain is important for its natural functions of flood flow conveyance, stream channel formation and water filtration. Building within floodplain areas upsets flood conveyance and increases risks to human life and property.

- The Township will continue to apply its floodplain regulations.
- The Township will ensure that improvements to existing buildings and structures will not increase the 100-year flood elevation.

Habitat and Natural Areas

Protection of habitat is accomplished by maintaining and promoting the health and diversity of natural areas as follows:

- Protect critical habitat areas through protection of topography and geology, soils, forest and vegetative cover, wetlands, floodplain, watersheds and streams.
- Protect as open space those properties that contain sites identified in the Luzerne County Natural Areas Inventory.
- Establish a networked system of large contiguous areas of open space.

Forestry Actions

Specific actions related to forestry enterprises:

- Provide ample opportunity for the location and development of *value added* enterprises that use the plentiful forest resources available in the Township.
- Encourage the local economic development organizations to work with the forest industry to promote and grow forestry related enterprises, particularly in the realm of *value added* products.

Mineral Actions

Specific actions related to mineral extraction:

- Confirm that mineral extraction operations comply with state and federal regulations.
- Zoning is the most effective means of managing the effects of mineral extraction on the local community.
 - To the extent possible under the terms of the Municipalities Planning Code, direct mineral extraction operations to suitable areas where impacts will be minimized.
 - Adopt standards to ensure that mineral extraction is controlled to the greatest extent possible within the limitations of the Planning Code and evolving case law.
- Include provisions to require coordination with the plan information and

standards applied by the Pennsylvania Department of Environmental Protection and the Susquehanna River Basin Commission.

- Encourage the Pennsylvania Utility Commission to regulate natural gas gathering lines.
- Adopt posting and bonding requirements for Township roads to ensure road damage is minimized and corrected by drilling operations.
- Encourage the local economic development organizations to work with the Bluestone Association to promote and grow the bluestone industry, particularly in the realm of *value added* products.

Dark Skies

The International Dark-Sky Association (IDA, Inc.) notes: *Today, people who live in or near cities have lost much of their view of the universe. This view is often substantially diminished even for people who live in smaller towns and rural areas. The spectacular view of the sky that our ancestors had on clear dark nights no longer exists. The great increase in the number of people living in urban areas has resulted in a rapid increase in urban sky glow due to outdoor lighting, brightening the heavens to such an extent that the only view most people have of the Milky Way or most stars is when they are well away from cities. This excess light in the sky has an adverse impact on the environment and seriously threatens to remove forever one of humanity's natural wonders - our view of the universe.*

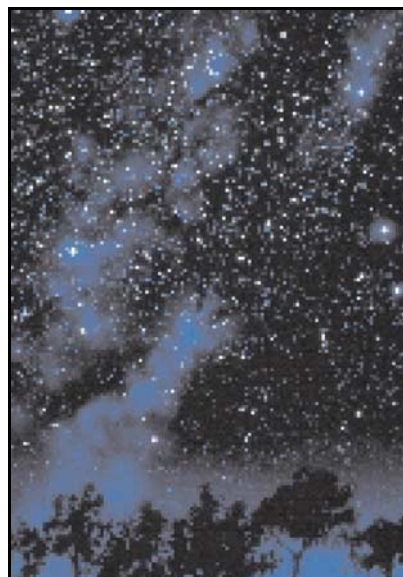
This sky glow that adversely affects the environment and compromises astronomical research is called light pollution, for it is wasted light that does nothing to increase nighttime safety, utility, or security. Such wasted light only serves to produce glare, clutter, light trespass and light pollution and wastes energy, money, and natural resources in the process.

Some solutions that minimize light pollution without compromising in any way nighttime safety, security, or utility:

- *Use night lighting only when necessary. Turn off lights when they are not needed. Timers can be very effective. Use the correct amount of light for the need, more is not better.*
- *Direct the light downward, where it is needed. The use and effective placement of well designed fixtures will achieve excellent lighting control. When possible, retrofit or replace all existing fixtures of poor quality. In all cases, the goal is to use fixtures that control the light well, minimizing glare, light trespass, light pollution, and energy usage.*
- *Use low pressure sodium (LIPS) light sources whenever possible. This is the best possible light source to minimize adverse effects on astronomical activities. LIPS lamps are also the most energy-efficient light sources that exist. Areas where LIPS is especially good include street lighting, parking lot lighting, security lighting, and any application where color rendering is not critical.*



Artist's rendering of city glow effect and a dark sky site. (IDA, Inc.)



- *Avoid development near existing observatories, and apply rigid controls on outdoor lighting when development is unavoidable. Such controls do not compromise safety, security, or utility. Outdoor lighting ordinances and codes have been enacted by many communities to enforce quality and effective nighttime lighting.*³

**Zoning Standards
for Lighting and Glare**

The Township will update Zoning Ordinance standards for the control of lighting and glare associated with nonresidential and residential development. The Township will enforce the standards and consider updates as needed.

³International Dark Sky Association, Inc., *Information Sheet #1*.