2.8 LAND-USE ANALYSIS

2.8.1 URBAN GROWTH AREAS

2.8.1.1 Definition

An urban growth area is a defined area of land having primarily urban land uses designated to be the main focus of future growth. Urban growth boundaries are usually established by one or more governing bodies that have jurisdiction over the defined area. Generally, such areas are already urban in nature and often have an incorporated town or city as its core. As such, a growth boundary usually contains the region's economic and cultural assets. On the outside of a growth area, there is often mostly open land comprised of farmland, forests, and natural wetlands, and only scattered settlements.

2.8.1.2 Location

The Chesapeake Basin has six complete designated urban growth areas: Bridgeville, Delmar, Greenwood, Laurel, Seaford, and Blades. Western Georgetown, Ellendale, and Harrington growth areas are also in the Basin. All are located in Sussex County, except for a small portion of the Harrington growth area in Kent County. *Map 2.2-5 State Investment Areas* shows the boundaries of these urban growth areas.

New Castle County

The minimal portion of New Castle County in the Chesapeake Basin is projected to become developed into suburban uses within the next 20–40 years. This region can be divided into three distinct areas.

- North of the canal, the land is partially sewered with the exception of areas west of Iron Hill and west of Frazer Road. This land is zoned for medium-density suburban uses on public sewer systems. The county's first priority for allocating unused sewer capacity is to infill areas easily served by existing sewer districts. Areas that are not sewered and areas that cannot be sewered with gravity systems are not planned for additional sewer investment.
- South of the canal and to the west of Middletown is the location of a proposed new county sewer district. Bunker Hill Road is generally the north-south divide. This land, if already subdivided for septics or community systems, is zoned as residential under the Neighborhood Conservation (NC) classification, or if public sewer is anticipated it is classified as Suburban (S). Some developers may also consider privately owned spray irrigation systems, which could transferred to county jurisdiction when regional sewer becomes available. Operating land application facilities may be retained by the county to supplement

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the capacity of the Middletown-Odessa-Townsend (M-O-T) regional treatment works. New subdivisions will have dry pipes installed to facilitate hooking up when central sewer becomes available. In the S zones, 20,000-square-foot lots are allowed if 35 percent open space is set aside and a 10-acre minimum subdivision is created (in the spirit of the superseded Cluster Option). To obtain a county Certificate of Occupancy, a sliding scale impact fee for sewer applies in this area's planned new sewer district.

- South of Bunker Hill Road to the county line, the remaining areas are classified as Suburban Reserve (SR), which requires 5 acres per lot on a septic system. The land in this portion of the Basin is presently utilized almost exclusively for agriculture and woodlands. The intent of the SR is to maintain low density to deal with environmental constraints or until the SR areas and Middletown areas are built out in 15 – 20 years. "Open Space Subdivisions" with community waste water system are permitted in the SR zone with 60 percent open space set aside and a minimum of 20 acres.

Kent County

The portion of Kent County in the Chesapeake Basin has no designated growth areas. The area is almost entirely rural in character. The communities of Hartly and Marydel have experienced minimal growth over the past 30 years and are not designated by county government as an urban growth area.

Kent County has designated the Route 1, north-south transportation corridor, with its associated sewer and water infrastructure, as a "build-out" area. The county is encouraging growth in this area, which is 2 miles from a sewer pumping station. In encouraging growth in this area, this policy lessens growth pressure in other areas of the county, including the Chesapeake Basin area west of this growth area. The west Harrington area has little development, but is within 2 miles of the county's sewer pumping station. The Sewage Treatment Plant in Harrington is on the east side of town and discharges into Brown's Branch, which flows northeastward into the Murderkill River. Most of the land 2 miles north of Harrington and west of Route 13 is utilized for corn and soybean production, with some livestock operations.

Sussex County

The Sussex County portion of the Chesapeake Basin contains six whole designated growth areas and portions of two others. The communities of Laurel, Blades, Seaford, Greenwood, Bridgeville, and Delmar are the cores of urban growth areas. Also, portions of the Georgetown and Ellendale growth areas reside in the Chesapeake Basin. The county government established these growth areas in conjunction with the towns through the county's comprehensive land-use planning effort of 1996–97. These designated growth areas are governed by the municipalities in the incorporated center core and the county government in the outer unincorporated areas of the boundary. An estimated 17,000 citizens, or 36 percent of Sussex County's portion of the Chesapeake Basin residents, live within a designated growth area.

During the Preliminary Assessment phase of this Basin's review, the "Western Sussex Water and Sewer Plan" was completed and accepted by Sussex County. The plan, developed by Whitman, Requardt and Associates (WR&A), identified the existing Water and Sewer infrastructure available along the U.S. Route 13 corridor. Specifically, the plan examined the water and sewer infrastructure needs for Greenwood, Bridgeville, Seaford, Blades, Laurel, and Delmar. The period of study is from a base year of 1995 to future projections in the year 2020 *(see Table 2.8-1 Wastewater Flow Projections)*. Population growth rates were from the Delaware Population Consortium. During the study period, these growth rates indicate that 35 percent of the overall population increase in Sussex County will occur in western Sussex County.

Table 2.8-1

WASTEWATER FLOW PROJECTIONS

	AVERAGE DAILY FLOW (GPD)					
Sewer District	**1995**	**2000**	**2005**	**2010**	**2015**	**2020**
Greenwood	45,000	132,000	161,000	211,000	223,000	236,000
Bridgeville	155,000	208,000	259,000	278,000	298,000	320,000
Seaford	895,000	1,164,000	1,274,000	1,437,000	1,608,000	1,790,000
Blades	105,000	128,000	385,000	521,000	678,000	991,000
Laurel	364,000	498,000	776,000	901,000	1,010,000	1,103,000
Delmar	480,000	545,000	686,000	847,000	935,000	1,051,000

WR&A came to the following conclusions:

- Based on water-demand projections, all towns in the study area will have to upgrade their existing Department well-withdrawl permits by 2020. The towns of Blades and Delmar will have to upgrade their safe well-pumping capacities and Greenwood, Bridgeville, and Blades will require additional storage.
- WR&A recommends that all these towns begin developing surface-water protection areas to protect their ground-water supplies.
- All wastewater systems in the study area will require infrastructure upgrades to serve areas in their respective development districts. The plan refers to the "development districts" as those areas consisting of towns, town centers, and development districts as defined in the 1997 Sussex County Comprehensive Plan.
- The study found that the service areas of Seaford, Blades, Laurel, and Delmar will have wastewater treatment capacity shortfalls of 780,000; 640,000; and 200,000 gallons per day respectively by the year 2020.

The plan summarizes the costs required to serve the projected growth area (refer to *Table 2.8-2 Capital Cost Projections)*, as defined by Sussex County. These costs include both upgrading and replacing existing infrastructure, as well as the construction of new facilities to serve areas in the development districts. Costs for the Blades Sanitary Sewer District reflect the infrastructure and treatment necessary to serve the expanded district.

The report contains several conclusions and recommendations pertinent to this Basin report, as seen below:

- Individual towns should provide sanitary sewer service to designated growth areas. (Note: The state does not necessarily concur or agree with the size or shape of these designated growth areas.)
- New subdivisions in designated growth areas should be directed to connect to the appropriate central sewer system for the towns along the Route 13 corridor.
- Towns should manage growth within their incorporated boundaries and monitor growth in their development districts. Preliminary engineering studies should be conducted to verify available system capacity and the infrastructure required prior to implementing future projects.
- Once funding is available, towns should look at establishing sewer or water protection areas to safeguard water supplies.
- The Town of Bridgeville should continue nitrogen sampling and upgrade biological treatment capacity to 800,000 gallons per day.
- A regional wastewater treatment plant to serve the Blades Sanitary Sewer District Planning Area, Laurel, and possibly Bethel should be reconsidered within the next five years.

2.8.1.3 Relationship to Natural Resources

Urban growth areas exhibit severe environmental im-pacts on-site and varying impacts downstream. In general, little natural, undisturbed habitat is retained in an urban growth area. A community park may be the occasional exception. However, by definition, the urban-growth portion of the Chesapeake Basin is expected, and even encouraged, to urbanize. In theory, the growth or urbanization of this land in an urban growth area will spare natural and agricultural lands in the more rural areas outside the growth area.

Infrastructure within growth boundaries generally keeps pace with new urban growth within the growth

Table 2.8-2

CAPITAL COST PROJECTIONS

SERVICE AREA	COLLECTION & CONVEYANCE	LIFT & PUMP STATIONS	TREATMENT	TOTAL
Bridgeville *(including Greenwood)*	$ 4.59 M	$ 0.83 M	$ 0.48 M	$ 5.9 M
Seaford	$ 6.1 M	$ 0.6 M	*	$ 6.7 M
Blades	$ 8.8 M	$ 1.0 M	$ 5.9 M	$ 15.7 M
Laurel	$ 5.75 M	$ 0.9 M	$ 0.85 M	$ 7.5 M
Delmar	$ 4.59 M	$ 0.65 M	$ 0.69 M	$ 5.9 M
TOTAL	**$ 29.8 M**	**$ 3.98 M**	**$ 7.92 M**	**$ 41.7 M**

**Seaford Plant upgrade and expansion under construction.*

boundary. Sewer systems and public water systems are frequently required as new growth occurs. Problems arise as local (and usually old) sewage treatment plants reach capacity as additional wastewater is collected from the new urban growth areas. Public water-supply systems may encounter similar problems as demand for water outpaces the municipal well's ability to pump and deliver potable water.

Most of the land has been developed for urban and suburban uses (such as residential, commercial, and industrial use) with considerable land tied up in publicly owned infrastructure such as roads, schools, and streets. Perhaps less obvious than the lack of natural habitat is the growth area's potential to generate urban storm-water runoff. This runoff is a form of nonpoint source pollution which occurs after significant rainfall. Rain and snowmelt run off the impervious surfaces (roofs, streets, parking lots, etc.) to local waterways, carrying with them contaminants such as motor oil, road salt, lawn fertilizer, and herbicides, bacteria, and common litter. Sediment from construction sites may also be in the runoff.

Streambank erosion is generally minor in this Basin due to the overall slow flow of the Basin's streams. Also, wetlands and/or aquatic vegetation in and immediately adjacent to streams minimize erosion. The area has a flat topography that is not conducive to significant overland water flow, which would otherwise erode streambank soils.

Flash-flood potential is extremely minor in the Chesapeake Basin due to the level topography and sandy soils. Rainfall percolates into the soil or slowly drains off the land in a harmless fashion. Ponding of rainwater on streets and highways does occur, however, and can pose a road hazard. Ponding may also impede farmers from tending their fields as low spots fill with water after unusually intense rains.

Wetlands within the growth areas are often degraded to varying degrees in many locales due to the poor water-quality characteristics of urban nonpoint source pollution.

2.8.1.4 Infrastructure within Growth Boundaries

Many of the residences and businesses within the growth area boundaries are connected to municipal sewage treatment plants, and are served by public water. These same growth areas also offer solid waste collection services for nearly all residents and businesses by the anchor municipality or private trash haulers.

The Cabinet Committee on State Planning Issues has already suggested that steps be taken to:

- "Encourage investment policies for the provision of water and wastewater infrastructure which strengthens communities, fosters more compact development patterns, and promotes the preservation of farmlands and open space."
- "Discourage the extension of public water and sewer service which promotes development in open spaces and natural areas."
- "Encourage redevelopment and improve livability of existing communities and urban areas."
- "Direct state investment and future development to existing communities, urban concentrations, and designated growth areas."

2.8.1.5 Intensity of Growth Areas

The Laurel growth area has the highest population density, with an estimated 393 persons per square mile. The Delmar urban growth area is least developed and has ample open space for new development. *Table 2.8-3 Growth Area Population* lists densities based on data available from the most recent census report and comparison of growth areas as seen in the "1997 Sussex County Comprehensive Plan, Final Draft, March 10, 1997."

The pattern of development in the Basin has historically relied on centers of transportation to get agricultural produce to markets in Wilmington, Philadelphia, and Baltimore. Many of the communities in the Basin sprang up along railroad depots. This is particularly so for Bridgeville, Greenwood, Seaford, Laurel, and Georgetown. Seaford area residents also utilized the Nanticoke River to ship by water. This river is still used today for interstate shipping of oil products, grain, and materials for the DuPont Company. Currently, the growth centers utilize the railroad for moving bulk products in

Table 2.8-3

GROWTH AREA POPULATION

GROWTH AREA	ESTIMATED POPULATION	SIZE OF GROWTH AREA (SQ. MI.)	POPULATION DENSITY
Greenwood	694	2	347
Seaford	7,040	18	389
Bridgeville	1,459	5	291
Laurel	3,928	10	393
Delmar (Del.)	1,141	8	143
Georgetown (1/4)	1,100	6	183
Ellendale (1/8)	380	2	190

Note: Figures are from the 1996 census population estimate, plus 10% for unincorporated development in growth areas.

and out of the Basin. Importing fertilizer for the farming community and exporting their grains to mills outside the Basin is of special importance. Highways now carry many items the trains once moved. These highways are now at least as important as the railroad in moving products.

2.8.2 NON-GOVERNMENT ORGANIZATIONS

The Nanticoke River watershed (including the Marshyhope Creek) comprises the single largest river system in the study area and in the state. Not surprisingly, it has several private local environmental organizations monitoring the activities on and around the river. Also, there are numerous national organizations that have local interests in the Chesapeake Basin, such as the Sierra Club and the Audubon Society. Discussed below are five of the more active private organizations in the Chesapeake Basin. All are mainly concerned with the Nanticoke River system in Delaware and Maryland.

2.8.2.1 Nanticoke Watershed Alliance

The Nanticoke Watershed Alliance consists of private non-profit organizations, businesses, trade associations, and public agencies from Maryland and Delaware. Their main mission is to examine and advocate conservation strategies for the Nanticoke Watershed. The alliance is led by a board of directors comprised of representatives from the Nanticoke Watershed Protection Committee, the Wicomico Environmental Trust, and Friends of the Nanticoke.

2.8.2.2 Nanticoke Watershed Preservation Committee

The adopted purpose of this citizen organization is "To recognize the Nanticoke River watershed as a priceless natural resource that must be cherished and passed on to future generations." The group has adopted goals to deal with development in the watershed, environmental issues, recreation and open space, and education for continued awareness.

2.8.2.3 Nanticoke River Watershed Conservancy

This conservancy was established to promote the preservation, protection, and balanced use of natural resources principally in, but not limited to, the watershed of the Nanticoke River and its tributaries. This organization is also interested in the acquisition and holding of conservation easements and other real property issues. Thus, the conservancy's main interest is that of land protection.

2.8.2.4 Chesapeake Bay Foundation

This foundation is the largest non-profit conservation organization working to help restore the Chesapeake Bay. The foundation was established in 1967 and has 85,000 members and contributors from corporations and from philanthropic foundations. Areas of special interest for this foundation include land-use planning, education, water quality, habitat, and transportation.

2.8.2.5 Delmarva Water Transport Committee

This committee is comprised of public agencies and private businesses interested in maintaining a navigable channel in the Nanticoke River. Membership includes the DuPont Company, Cargill, and the U.S. Corps of Army Engineers (Baltimore District).

2.8.3 LAND-USE REGULATIONS

2.8.3.1 Subdivision Procedures

The Department has regulatory program requirements for erosion and sediment control, wetlands, subaqueous lands, water supply, wastewater, air pollution control, and other environmental issues that must be met by all new developments. Some departmental programs provide a baseline, or minimum set of environmental standards. The Department, through its review and comment on Delaware Land Use Planning Act (LUPA) reviews, Subdivision Reviews, and Developers Advisory Service Reviews encourages people, through incentives and environmental information, to exceed these minimum standards.

Local governments with land-use regulatory powers such as the counties derive those powers from County Planning. In addition, Middletown, Marydel, Greenwood, Bridgeville, Georgetown, Seaford, Delmar, Ellendale, and Laurel also derive local land-use powers from their town charters, each of which are individually crafted and approved by the General Assembly. Infrequently, applicants have great difficulty meeting local land-use standards and are granted a variance from local land-use regulations after a public hearing.

New Castle, Kent, and Sussex counties send all land-use planning action applications they review to the Office of State Planning Coordination for possible selection for review and comment under the state Land Use Planning Act (LUPA). LUPA review projects. Comments are available on the Office of State Planning Coordination's Internet site (http://www.state.de.us/planning).

New Castle County

In New Castle County, a Unified Development Code (UDC) is used to combine the functions of the now

superseded Zoning Ordinance and Subdivision Regulations. The old Zoning Ordinance regulated uses in zones and rezonings, and the Subdivision Regulations regulated new major and minor subdivisions.

Under the UDC, new development will be subject to performance standards, including community character, more stringent environmental standards, and adequate public facilities. A major benefit of the UDC is that it provides predictability through requiring site plans to be submitted with rezonings. Additionally, existing zones are designated through measures of existing community character. The UDC will limit the growth of strip development by combining highway access in adjacent newly created lots and through stimulating open space development that requires 60 percent open space in SR Zones with a 20-acre minimum, or one septic system for every 5 acres.

Kent County

Kent County has separate Zoning and Subdivision Ordinances. The Zoning Ordinance refers to the zoning requirements and regulations such as setbacks and separation between incompatible uses. Kent County's Zoning Maps show the boundaries and labels of the zones into which the county has been divided. The Subdivision Ordinance requires mapping of the metes and bounds of parcels, newly created lots, streets, easements, slope, natural features, storm-water facilities, open areas and structures for preliminary reviews, the preservation of land records, and property tax assessments.

Kent County's Development Advisory Committee (DAC) currently reviews major subdivisions, site plans, and conditional uses with site plans. A major subdivision is defined as the creation of more than five lots, and/or where the creation of two or more lots results in the creation of a state-maintained road. (A minor subdivision is defined as the creation of four lots or less plus the residual, not involving the creation of a public or state-maintained road. Further subdivision of the residual lot may be done under minor subdivision regulations provided that the lots are 20 acres or more in size.) Site plan review is required for all multi-family dwellings containing 10 or more units or comprising two or more buildings, town houses, manufactured home parks, hotels, motels, and business, commercial, industrial, or buildings with over 5,000 square feet of floor area. Certain conditional uses also require site plan review; they are specified in the county's zoning ordinance.

Sussex County

Sussex County has separate Zoning and Subdivision Ordinances that govern zoning and the subdivision of lands. All subdivisions, where new road construction will occur, are sent through the Sussex County Technical Advisory Committee for review and comment by the Department and other agencies. Single lots that are created and do not require a street or road to be built are required to have all necessary permits before a building permit is issued.

2.8.3.2 Septic Issues

Current state septic regulations governing the design, installation, and operation of on-site wastewater treatment and disposal systems deny the placement of standard (gravity and elevated sand mounds) and/or alternatively designed low-pressure pipe septic systems on soils where the seasonal high water table is within 20 inches of the soil surface. As an option for those property owners, the septic regulations allow for alternatively designed septic systems on a case-by-case basis. These alternative septic systems utilize technologies that pre-treat the effluent to a specific level, usually to levels below 10 ppm of nitrate-nitrogen. Total and fecal coliform levels are also significantly reduced within these pretreatment units. The soil must still dispose of the effluent generated. The cost of these pretreatment units has dropped significantly (from $12,000 – $15,000, to $10,000 – $12,000) so that more people can afford them.

A problem arises on many of the parcels where alternative technologies would be utilized. These parcels are inherently wet, and many are freshwater wetlands. When the water table is within 10 inches of the soil surface, it is difficult to get an elevated sand mound to work properly. Thus, on parcels where the seasonal high water table is expected to be within 10 inches of the soil surface, the Soil Assessment Branch has required that observation wells be installed to verify the depth to the seasonal high water table. If the water table is within 10 inches of the soil surface during the monitoring period, the parcel is considered unacceptable as a site for an alternative septic system. However, the Department has granted variances in certain instances where site-specific conditions may minimize ground-water mounding. Most of these sites are located in wooded areas with hydrophytic vegetation indicative of wetlands. Most soils are hydric and in many cases the wetland hydrology has been observed. These sites are jurisdictional wetlands as defined by the Clean Water Act and as delineated with the *1987 Army Corps of Engineers Wetlands Delineation Manual*.

In the past, on parcels considered to be freshwater wetlands, the Department informed the property owner of the possibility that their parcel may contain jurisdictional wetlands, and depending on the location of the wetland (i.e., isolated, adjacent or headwater), a permit from the appropriate federal agency might be needed. In most cases, the appropriate federal agency was not notified.

Consequently, freshwater wetlands are slowly being replaced with residential development one acre at a time.

2.8.4 LAND-USE CONCERNS

2.8.4.1 Strip Development

Strip development is a development pattern that occurs in rural areas along roads. Typically, this development is a form of sprawl in which land is converted from natural or agricultural uses to small-lot residential homes. Usually these homes line a road on one-acre lots with one driveway per home. Both water and wastewater are the responsibility of the homeowner who has little option but to use an on-site septic tank for wastewater disposal and a shallow well for water supply. This type of development is common in the Chesapeake Basin. It seems to occur close to a municipality and is prevalent in the growth areas of Sussex County. This pattern is evident by the distribution of domestic septic systems shown on *Map 2.8-1 Strip Development and Growth Patterns.*

Strip development is generally considered a poor form of development as it causes a loss in highway capacity with its one driveway per home ratio; takes productive farmland out of production; puts demands on public services (school buses, state police, etc.); contributes to ground-water pollution from the septic tank; and increases air pollution due to longer car trips to commercial areas to acquire needed goods and services.

2.8.4.2 Sunsetting

Sunsetting is the termination of an approval to develop a tract of land to another use when there is a lack of any meaningful progress towards the proposed use. Frequently, a five-year benchmark is employed to ascertain if progress is being made.

In New Castle, zoning was sunset with the adoption of the UDC. There is some relationship between the older zoning and new UDC zoning standards. In the U.S. 301 area some Commercial zones were reduced down to the current Commercial Regional zone. As of January 1, 1998, new development activity will be sunset if there is no substantial progress toward implementation of plans after five years.

Kent County's Subdivision and Zoning Ordinances contain sunsetting provisions. In the Zoning Ordinance, if a property is rezoned contrary to the Comprehensive Plan, the property owner has 18 months to commence construction. In the Subdivision Ordinance, if commencement of construction has not begun within five years of final approval by the Levy Court, the recorded subdivision plan shall be expunged.

Sunsetting can be voluntary or mandatory. In the Sussex County portion of the Basin, sunsetting can occur voluntarily by application for landowners possessing commercial land that is agricultural or residential unless the landowner desires to pay the higher property tax based on the unused commercial zoning. There is no cost to the landowner, and many people have received no opposition and unanimous Sussex County Council approval. As of the December 1997 adoption of the Sussex County Comprehensive Plan, all new subdivisions have five years to show substantial progress toward completion or their application will be sunset and the land will return to its original zoning classification. Other subdivisions that were approved prior to the adoption of the 1997 Sussex County Comprehensive Plan will also be sunset unless there is substantial progress toward completion.

The automatic sunsetting of proposed yet unbuilt projects is environmentally favorable. As a minor discouragement to poorly planned growth, less growth in deeply rural areas means less ground-water withdrawals and no septic wastewater released to the water table. The Cabinet Committee on State Planning Issues called for a state goal of "protecting critical natural areas from ill-advised development."

2.8.5 COUNTY PLANNING

2.8.5.1 Zoning Status

The Quality of Life Legislation was amended under Shaping Delaware's Future Legislation of 1995. Additional requirements were placed on comprehensive plans in which state agencies were required to provide natural resource and other data to counties. The comprehensive plans and State Capital Budgeting have to consider 11 Shaping Delaware's Future Goals. Furthermore, the Cabinet Committee on State Planning Issues' recommendations are also considered.

In New Castle County, the remaining open land has been rezoned at the end of 1997 as part of the UDC. This is intended to put a stop to building that does not resemble the project plans. Other changes include new design standards, as well as tougher environmental standards and landscaping requirements. Requirements for adequate community facilities ensure that approval for new construction occurs after schools, roads, water, sewer, and other essential services are in place or are ready to be built. Impact fees impose a fair cost to new development so that new growth pays its own way.

In the Kent County portion of the Basin, most of the land is zoned Agricultural Conservation (Office of Management, Budget and Planning, 1981).

In Sussex County, a new Conservation Zone Ordinance is being drafted to respond to citizens' concerns that the concept developed in earlier drafts of the plan was too restrictive. However, a Conservation Zone will most likely include all lands within a specific distance to tidal wet-

lands along the Nanticoke River. The Sussex County Zoning Maps will also designate a smaller growth area bounded by Laurel, Seaford, and Blades, in addition to designated growth areas around towns described in other portions of this section. Recently, Sussex County adopted a measure to reduce the amount of land that is required to get an approval for a mobile home to reduce unauthorized junkyards and other nuisances.

Discussion

Today, zoning controls have generally been upheld with respect to the following areas of collective protection of private property in neighborhoods:

1. Maintaining property values.
2. Stabilizing neighborhoods and preserving their character.
3. Providing for uniform regulations throughout each district. Because planned unit developments often do not conform to this purpose they are sometimes opposed.
4. Providing for moving traffic rapidly and safely. This purpose is frequently used to argue against higher density.
5. Controlling aesthetics. The courts have upheld a denial of permits for structures at variance with existing structures that would cause a depression of property values.

In some areas, rigid zoning controls have given way to "flexible" controls on development. One of the most common is the "wait-and-see" zone.

In the wait-and-see areas, undeveloped lands might be zoned only for exclusive agriculture or large-lot residential uses. However, the city or county is often only waiting for a developer who will propose a zone change that allows the exercise of the widest administrative discretion. These wait-and-see zones may extend to most of the buildable land in a jurisdiction, even though the comprehensive plan and the official zoning map may show something else (Solnit, 1988).

Site plan review is another flexible land-use control. It can be used on its own or as part of the planned unit development procedure. The general idea is that the community receives some assurance that the developer will follow the detailed design plans presented. During these reviews the planning agency has much more to do than simply determine whether or not a proposed development is in compliance with applicable ordinances and codes. The planners must have skills required to negotiate not only on behalf of the jurisdiction and the developer, but also with several other interest groups, including the general public, the residents, and the property owners near the proposed development. They must also negotiate with other landowners and speculators who will be affected by the approval of the proposal under review. One of the most difficult tasks the planning agency has to do is to write conditions of approval that will both be fair and will also stick.

Rural zoning for controlling outdoor advertising or promoting agricultural development, forestry, and recreation is not apparent in this Basin.

Distinctions Between Planning and Zoning

Zoning, as it is practiced, is only part of the process called "planning." Zoning separates a jurisdiction into districts, regulates land use inside each district, and maintains separation between conflicting uses. However, planning has a much broader focus: it concentrates on development in relation to the community's current and future social and economic well-being. A practical analogy is that planning measures such as adopted plans, goals, and so forth are official policy for the future, while zoning authorizes and permits uses for specific properties right now.

Every county and town in the state now requires that zoning conform to a "well considered plan" or a "comprehensive plan." This consideration shows local governments that zoning cannot be truly effective unless the long term is evaluated, and that the comprehensive plan is the means by which the rational allocation of land can be achieved. It should be a prerequisite for zoning.

2.8.5.2 Data Systems

New Castle County uses the GIS that was used by the Water Resources Agency of New Castle County (WRA). The system can use data from the Department's GIS and has been used to map Water Resource Protection District Overlays and Critical Natural Areas, etc.

Kent County Department of Planning has an implementation plan for Coastal Ocean Management, Planning, and Assessment (COMPAS) Delaware, Resources Protection Module. This is a joint project between Kent County, the Department's Delaware Coastal Management Program (DCMP), the National Oceanic and Atmospheric Administration (NOAA), the U.S. Fish and Wildlife Service, and the Delaware Estuary Program. COMPAS is a computerized tool developed to assist Kent County in their land-use planning process. The computerized Resource Protection Module may be used in the Site Review/Pre-Application and Growth Management areas of county planning and zoning administration (DCMP, 1997).

Sussex County has a computerized GIS, which has digitized most of the tax-map parcel data for the county. No other use is planned for the system other than managing data for the Assessment Division of Sussex County, which handles property tax administration. It is not known what capabilities the system has for providing county officials with environmental information.

2.8.6 OPEN SPACE AND RECREATION

2.8.6.1 Parks

Recreation is typically defined as any type of conscious enjoyment that occurs during leisure time. Recreation

provides a variety of benefits to the public, including personal, social, economic, and environmental benefits. For example, a walk in the park during a lunch break gives employees a chance to recharge their spirits before returning to work. Athletic activities provide positive alternatives to youth who may otherwise become involved in destructive behavior. Undeveloped parkland along a stream corridor can provide wildlife habitat and filter nutrients before they reach our waters.

Recreational resources are natural or man-made resources that are used to obtain enjoyment during leisure time. These include ball fields, hiking and walking trails, fishing ponds, tennis courts, picnic areas, and other amenities. Parks and greenways provide recreational resources for community use and are important resources to consider as a part of land development processes.

The Chesapeake Basin has more than 20 municipal parks, comprising nearly 60 acres, to serve the active recreation needs of its residents. Active recreation facilities include ball fields, swimming pools, and playgrounds. All of these municipal parks are located in Sussex County, where the bulk of the Basin's population resides. One state park, Trap Pond, lies within the Basin's boundary, also in Sussex County. Kent County manages some open space in the Basin near Felton. The Chesapeake Basin also includes two state-managed wildlife areas and two state forests. state parks, county open space, state wildlife areas, and state forests help to meet the population's needs for passive recreation, such as fishing areas, hiking and walking trails, and wildlife-watching. *Map 2.8-2 Recreation Sites* shows the locations of these parks and wildlife areas.

According to a 1995 survey conducted as a part of the Statewide Comprehensive Outdoor Recreation Plan (SCORP) process, recreation needs in the Chesapeake Basin are inadequately met. While the Chesapeake Basin encompasses significant amounts of state-managed wildlife areas, forests, and nature preserves, the amount of local and regional parkland developed for active recreation is lacking. As the population of the Chesapeake Basin grows, and development pressures in the Basin heighten, acquisition and development of parkland and recreation facilities in and around population centers will be important to maintaining a high quality of life for Basin residents.

The Chesapeake Basin includes roughly 60 acres of local open space and parkland, or about 1 acre per 1,000 population. This number falls significantly short of the National Recreation and Park Association (NRPA) recommendation of 10 acres of local parkland per 1,000 population. However, as previously noted, these local parks are concentrated in the Sussex County portion of the Basin. Nearly 27 percent of the Chesapeake Basin residents live in New Castle and Kent counties, where there are no municipal parks. Chesapeake Basin residents in New Castle County are served by parks outside the Basin (in Newark, Middletown, and unincorporated areas in New Castle County). Residents in the Kent County portion of the Basin have few active recreation areas nearby. Additionally, Sussex County's local parks are concentrated in the Seaford and Laurel areas. Chesapeake Basin residents outside of these municipal areas have inadequate access to local parks.

According to the 1995 SCORP survey, residents throughout the Chesapeake Basin and elsewhere in the state would like to see more hiking and walking trails, bicycle paths, and paved walkways. These amenities can be incorporated into community greenways, or open space corridors, which can link parks with neighborhoods, commercial centers, schools, and historic and cultural sites. The City of Seaford and the Town of Laurel are in the process of developing riverfront walkways as a part of downtown revitalization. Efforts need to be made Basin-wide to expand such initiatives and create pathways that connect our communities and provide recreational opportunities along with alternative transportation routes.

In addition to the need for pathways and trails, residents of the Chesapeake Basin also expressed a need for playgrounds and tot lots; programs for teens, people with disabilities, and the elderly; historic and nature education programs; fishing and boating areas; swimming pools; and ball fields.

To help county and municipal governments better meet the recreation needs of Chesapeake Basin residents and all Delawareans, the Division of Parks and Recreation offers a variety of assistance to local governments. Matching park and greenway grants through the Delaware Land and Water Conservation Trust Fund provide financial assistance to county and municipal governments for park and greenway planning, acquisition, and development. The Division also has a variety of technical assistance available to local communities, including park and open space guidelines and design standards, trail construction and maintenance publications, and other resources that communities can use to develop recreational facilities to meet the needs of their residents.

As development is planned in the Chesapeake Basin, it will be important to ensure that adequate recreation facilities are planned to serve the Basin's residents.

2.8.6.2 State Resource Areas (SRAs)

In 1990, the Land Protection Act was signed into law, thereby creating Delaware's Open Space Program. As a part of this program, 20 SRAs were created, including state, federal, local, and private conservation lands and inholdings, and potential additions to these areas. Part of the mission of the Open Space Program is to protect lands within these SRAs through purchase, donation, or conservation easement.

The Chesapeake Basin includes portions of five SRAs: Chesapeake and Delaware Canal, Blackbird, Central Kent, and Ellendale/Redden State Forests, and Great Cypress Swamp, and two entire SRAs: Nanticoke River, and James Branch, and one stand-alone area: Taber State Forest.

The Natural Heritage Program has recently undertaken an analysis of rare and endangered species locations to compare with the state natural area inventory for several of Delaware's watersheds. More than half of all known occurrences of rare and endangered plants have been outside of natural areas. Such an analysis has not yet been completed for the Chesapeake Basin, but will be in the future. As a result of this analysis, the natural areas inventory will be amended and the Open Space Program will be able to look at expanding its SRAs to better preserve rare ecosystems.

For more information on this subject, refer to the Living Resources Section 2.7.4.

2.8.7 CRITICAL AREAS

A *critical area* is a specific geographic area of the state, or basin, based on studies and resource assessment analysis of physical, social, and economic trends. A critical area is demonstrated to be so unusual, important, or significant to the state or basin that the Department designates it for special management attention to assure the preservation, conservation, or utilization of its special values.

The 1978 Delaware Land Use Planning Act defined a critical area as "an area wherein the establishment or maintenance of a viable physical, economic, or social environment is of more than local concern; or the physical, economic or social characteristics of said area are of primary importance or uniquely sensitive, including, but not limited to wetlands, major port facilities and historic areas." This bill did not include ". . . agricultural lands in productive use."

For purposes of the Whole Basin Management Program, the definition of a critical area can be expanded to include:

a. areas having or containing a significant positive or negative impact upon environmental, natural, scientific, cultural, historical, or archaeological resources.

b. areas significantly affected by, or having a significant effect upon, an existing or proposed major public facility or other areas of major investment which are intended to serve substantial numbers of people beyond the vicinity in which the development is located and which tends to generate substantial development or organization.

The phrase "of more than local concern" is meant to describe those areas where uncontrolled or incompatible large-scale development (or change in present use) could result in damage to the environment, life, or property where the short- or long-term public interest is of more than local benefit. Examples of land uses of more than local benefit include state parks and dedicated business centers.

A critical area has a sense of uniqueness, quality, rarity, and/or economic benefit to the greater community. They are sensitive and vulnerable to uncontrolled growth or development that may be incompatible with them.

The critical areas of the Chesapeake Basin have been categorized as either natural and cultural, economic, or public infrastructure. Suggested critical areas within the Basin are listed in Table 2.8-4 under these three categories.

Table 2.8-4

EXAMPLES OF CHESAPEAKE BASIN CRITICAL AREAS

CATEGORY	AREAS OF CONCERN
Natural & Cultural	Nanticoke River Riparian Corridor with wetlands Broad Creek Riparian Corridor with wetlands Marshyhope Creek Riparian Corridor with wetlands Choptank River Riparian Corridor with wetlands Nanticoke Wildlife Area Redden State Forest Ellendale State Forest Trap Pond State Park Endangered Species Sites Historic Sites Norman G. Wilder Wildlife Area Hartly Carolina Bays
Economic	DuPont Seaford Nylon Plant Agricultural Preservation Districts Nanticoke River
Public Infrastructure	Chesapeake & Delaware Canal Nanticoke Hospital RR bridge over C&D Canal RR bridge over Nanticoke R. STP's (Delmar, Laurel, Seaford, Greenwood) Rte. 13 Right-of-Way Schools

2.8.8 COORDINATION WITH MARYLAND (USF&W, NANTICOKE/BLACKWATER GROUP)

Environmental activities in Delaware's portion of the Chesapeake Basin need to be coordinated with activities in Maryland's portion of the Basin. The Nanticoke River

watershed receives more attention from citizens' groups than other portions of the Basin. This is probably due to the more intense use of this relatively large river by commercial and recreational interests. Listed below are several specific examples of coordination efforts between the two states in regard to the Chesapeake Basin.

1. The Department Planning Office has a liaisoning effort in place through the Nanticoke Watershed Alliance based in Salisbury, Maryland. This umbrella organization includes the Maryland Department of Natural Resources, U.S. Fish & Wildlife Service, Maryland Office of Planning, the Wicomico Environmental Trust, The Nature Conservancy, the Chesapeake Bay Foundation, as well as several corporate members of the alliance.
2. Cooperation with the U.S. Army Corps of Engineers, which is responsible for navigation issues on the Nanticoke River and the Chesapeake & Delaware Canal. The Corps' Baltimore Office has jurisdiction over the Nanticoke River.
3. The Department staff have participated in discussions with the U.S. Fish and Wildlife Service, Maryland Department of Natural Resources, and private conservation organizations to develop a land protection strategy for the Nanticoke, south of Seaford.

2.8.9 HISTORICAL AND ARCHAEOLOGICAL RESOURCES

Human occupation of the Delmarva Peninsula began more than 12,000 years ago. Since that time, thousands of archaeological sites and aboveground structures and buildings have been created. These cultural resources reflect the lives of the people who lived and worked here. Although most of the aboveground historic period resources dating before 1945 in Delaware have been recorded, only a small percentage of the prehistoric and historic period archaeological sites have been identified.

Over the last decade, the Delaware State Historic Preservation Office has commissioned three statewide historic preservation management plans covering both aboveground and belowground (archaeological) resources. These management plans address the types of cultural resources likely to be found in each physiographic zone (or management unit) of the state, for specific periods of prehistory and history. Priority guidelines for research and preservation are established, and stresses on resources are discussed.

The prehistoric resource management plan places the Delaware portion of the Chesapeake Basin within the Interior, Nanticoke Mid-Drainage, and Interior Swamp (James Branch and upper Pocomoke) management units. Overall data quality for all three management units is listed as poor, although several studies conducted after the publication of the statewide management plan have improved this situation for the James Branch and Nanticoke. Based on information available at the time the management plan was prepared, all three management units have a low probability for significant examples of most site types for the earliest periods of prehistory (Paleo-Indian and Archaic). The Nanticoke Mid-Drainage and Interior Swamp management units have a high probability for significant sites of all types for the Woodland I and Woodland II periods of prehistory. Contact Period sites are most likely to be found in the vicinity of the Nanticoke River.

Residential development and the expansion of farm fields cause stresses on prehistoric resources. These two processes are often related because farmers sell off strips of land along roads for development and then clear the wooded strip at the back of the farm. The expansion of farm fields is of particular concern because previously wooded strips along streams are being cleared, exposing sites that had previously been protected by the woodlands.

The management plan for historic period archaeological resources does not define specific geographical management units. Data quality for historic archaeological resources is generally poor statewide, but it is possible to make general statements about the frequency and distribution of sites dating to specific time periods. In the Chesapeake Basin, early European settlement (1630 to 1730) was concentrated along the Nanticoke River and the Marshyhope Creek. Population growth in this area was slow until after the Revolution because disputes between the Maryland and Pennsylvania proprietors made it difficult to determine whether grants of land were secure. In general, settlement was most concentrated along transportation routes and in urban centers, most of which still exist today. Rural industrial sites, including sawmills, gristmills, and iron forges, may be preserved along stream valleys. More urban industrial sites, including boat yards as well as factories, are also sometimes preserved.

Stresses on historic period archaeological resources, especially those dating to the first period of settlement, are similar to those identified for prehistoric archaeological resources. Development along roads threatens late 18th- and 19th-century sites oriented along transportation routes. The Marshyhope and Nanticoke watersheds are identified as areas of particular stress on historic period archaeological sites. Urban industrial sites are also threatened by development.

The Delaware Comprehensive Historic Preservation Plan sets priorities for the identification, documentation, and preservation of aboveground historic period resources. Priorities are expressed in terms of broad themes reflecting the social and economic history of the state. The Chesapeake Basin is located primarily in the Upper and Lower Peninsula geographic zones as defined in this plan. Priority themes for these zones include Agriculture and Settlement Patterns, and Demographic Change.

Aboveground resources are threatened both by development and by deterioration. Development often results in the demolition of otherwise intact and usable buildings or structures, even when a building could be incorporated into the development, as when an historic farmhouse is rehabilitated as one of the residences in a housing development. Even when not threatened by new development, buildings may succumb to age. They are often replaced by new buildings and relegated to use as secondary structures. Eventually, they fall into disrepair and are abandoned.

Perhaps the greatest threats to cultural resources of all types are actions that do not require federal funds or permits. Under the National Historic Preservation Act of 1966, as amended, effects on cultural resources must be taken into consideration when planning federal actions. Some states have attempted to institute similar programs for non-federal actions, but such programs are expensive to implement and often not popular.

2.8.10 BUFFERS AND CONSERVATION ZONES

Other factors remaining equal, fouling of the state's precious aquatic resources and natural streams occurs with greater frequency unless naturally vegetated buffers are present on their edges and boundaries to control sedimentation, erosion, nutrients, and runoff. Buffers reduce the potential for eutrophication, control water temperature, maintain dissolved oxygen concentration, and provide crucial wildlife habitat. These buffer areas preserve waterways, wetlands, and floodplains that perform crucial, cost-effective drainage and flood control without general public subsidies and direct tax assessments.

Some benefits of forested streamside buffers:

- Maintain and restore the chemical, physical, and biological integrity of water resources.
- Remove nutrients and toxics from runoff and ground water.
- Reduce erosion and control sedimentation.
- Stabilize stream banks.
- Provide infiltration and attenuation of storm-water runoff.
- Maintain stream base-flows during dry periods.
- Provide organic matter that is the source of food and energy for aquatic ecosystems.
- Provide shade to streams and encourage desirable aquatic species.
- Provide riparian habitat for insect-eating birds and other wildlife.
- Provide scenic value and recreational opportunity.
- Minimize public investment in waterway restoration, storm-water management, and other water resource expenditures that eliminate the meandering course on which streams depend for their ecological variety.

Aquatic resources' ability to treat pollution without public investment is enhanced if the plant and animal community and a portion of its surrounding uplands are left intact. Storm-water facilities should not be placed in wetlands or riparian areas. The construction of the facility damages the aquatic system, while actual operation of the storm-water facility causes sedimentation and eutrophication. Other damage occurs when aquatic systems are excavated to remove accumulated sediments. Aquatic resources are stressed beyond their natural limits, and significant reduction or elimination of their pollution removal ability and other functions occur when the surrounding uplands are disturbed. Forested buffer strips between most uses of land riparian systems can significantly protect the functions and values of aquatic resources.

Different types of vegetation in riparian landscape buffers can affect their capability to remove nonpoint source pollutants; improve stream quality, wildlife habitat and fish habitat; and perform other buffer functions. Grass has low value for improving wildlife, water quality, and aquatic systems; herbaceous buffers made up of wildflowers or legumes have low-to-medium value; shrubs have medium-to-high value; and forests have the greatest value. Forested riparian buffers can be designed for management to maintain nutrient uptake and provide for the harvesting of natural products.

There are two basic approaches for delineating riparian buffers. The first approach is to use a fixed setback between soil disturbance and the aquatic system. The principal advantage to this approach is that it is universal in its application and does not require detailed environmental assessments to provide some benefits to the community. It can be used effectively where impacts to watersheds and land prices are low. However, it does not recognize the importance of slopes, erodible soils, irregular wetland or floodplain boundaries, and stream/wetland classification. The second approach to buffer strips is through the delineation of a floating buffer whose width changes to accommodate these factors not considered in the first approach. It recognizes the presence of land with low environmental sensitivity that may be in proximity to an aquatic system, and is more effective than the fixed buffer arrangement for controlling impacts to watersheds from land-use changes. However, it does require a detailed environmental assessment of site conditions, and a well-developed land-planning administration in order for it to be translated into benefits for the community (Mantell et al., 1990).

2.8.11 DATA GAPS AND RECOMMENDATIONS

1. The Department should encourage the three counties to have a (two or three year) sunset time of rezoned land in the non-urban growth areas of this Basin. Land in urban growth areas should have a longer time span for initiating new construction on rezoned land.
2. For large single-use projects, in areas where development is not encouraged, there is an opportunity to use the LUPA process more effectively to discourage sprawl. The Department should more actively seek agreement with the Office of State Planning on the definition of what is "more than local concern" and therefore trigger reviews under LUPA to protect open space.
3. The Department should support the new county sewer district in the greater Summit area north of Middletown to reduce the potential for contamination of the water-table aquifer.
4. Corridor preservation for reducing air pollution and runoff and reducing sewer construction should be supported by the Department along U.S. 301 and other major corridors.
5. Comprehensive plans that are relevant today may become obsolete tomorrow. Most planning and zoning relationships must be reassessed on a continuing basis to guarantee that important land functions continue to operate while the land is used, no matter what the use.
6. The Department should encourage the development of recreation facilities in and around population centers; encourage the inclusion of usable open space in the subdivision process; and work with local communities throughout the Basin to help them meet the recreation needs of their residents.
7. Development of lands within State Resource Areas, Natural Heritage Sites, Natural Areas Inventory, and Old Growth Forests should be discouraged.
8. Critical Areas should be accorded special status and given special attention when a development is proposed on or adjacent to such an area. It is recommended that state and local governments care for these areas. Their actions and decisions should reflect a major commitment toward protecting and conserving these resources.
9. Implement requirements for buffer zones along streams to protect prehistoric and early historic period archaeological sites.
10. Establish historic review boards, such as the one in New Castle County, which will result in proactive measures to preserve historic buildings and efforts to record important features of those that cannot be preserved.
11. Preservation and restoration of riparian buffer for both natural streams and tax ditches should include new, environmentally friendly, techniques for tax ditch maintenance, inter-agency coordination, and public/governmental education.
12. Develop model zoning ordinance favoring riparian protection.
13. Recommend, whenever practical, the use of non-structural alternatives for erosion control. A combination of rip-rap with natural vegetation should be emphasized where shoreline erosion is a problem for property owners.
14. Work with county and municipal governments to develop and update open space ordinances.
15. Promote forested riparian buffers in Environmentally Sensitive Areas.
16. Towns are finding that their zoning codes, conceived and written in the 1960s, do more to prevent rather than manage economic growth. Traditional tools such as Neighborhood Districts, Village Overlays, Transit Oriented Overlays, and updating town comprehensive plans, should be supported to direct growth in areas where infrastructure already exists.
17. Intergovernmental coordination zones should be designated in growth areas and areas likely to be annexed to provide the latest and best data to decision-makers.
18. A study should be undertaken to determine the maximum density an urban growth area must attain before additional undeveloped land is added to the urban growth area. After a density determination is developed, the State Cabinet Committee on State Planning Issues may establish policy regarding infrastructure expansion when density of an urban area is below the threshold value.
19. Encourage update of town plans. The Department, in conjunction with the Office of State Planning Coordina-tion and the Sussex County Planning Department, should encourage the towns of Greenwood, Bridgeville, Seaford, Blades, Laurel, and Delmar to develop comprehensive plans. The plans would, among other things, prioritize the areas in and around the towns for sewer and water service and annexation procedures. The plans should include a transportation element, conservation element, and economic development element.

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