

ENVIRONMENT

As development continues in Frederick County, environmental issues will become increasingly critical. The environmental issues in the County are concerned with natural resources and their protection. These issues exist in the rural and urban portions of the County.

Physical Characteristics

The County can be divided into three physical areas. In the eastern portion of the County, in a band running north-south through the length of the County, generally east of Interstate 81, the land is underlain by Martinsburg shale. The soils tend to be dense shale soils that are not well suited for intensive agriculture or septic drainfields. Much of the land is used either as pastureland or is developed for residential or urban use. Much of the sewered suburban development in the County is in this area. This area consists of broad, relatively level ridges separated by steep stream valleys.

The second area is underlain by limestone-carbonate bedrock in a band that runs north-south through the County between Interstate 81 and Little North Mountain. Outside of the City of Winchester, much of this area is currently used for agriculture. Most of the orchards in the County are located in this area. Soils in this area tend to be better suited for septic drainfields, except where the soils are thin. The terrain tends to be gently rolling.

The third area in the County is the large western Valley and Ridge area that is underlain by a variety of shale, sandstone, and limestone formations. This area consists of alternating valleys and ridges that run north-south through the County. The ridges tend to be very steep, and the highest elevations in the County are in this area. Soils are varied, although most tend not to be well suited for septic drainfields. Most of the Valley and Ridge area is currently forested.

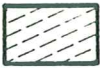

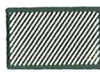
The staff has evaluated the suitability of various areas of the County for development by mapping the location of three types of characteristics:

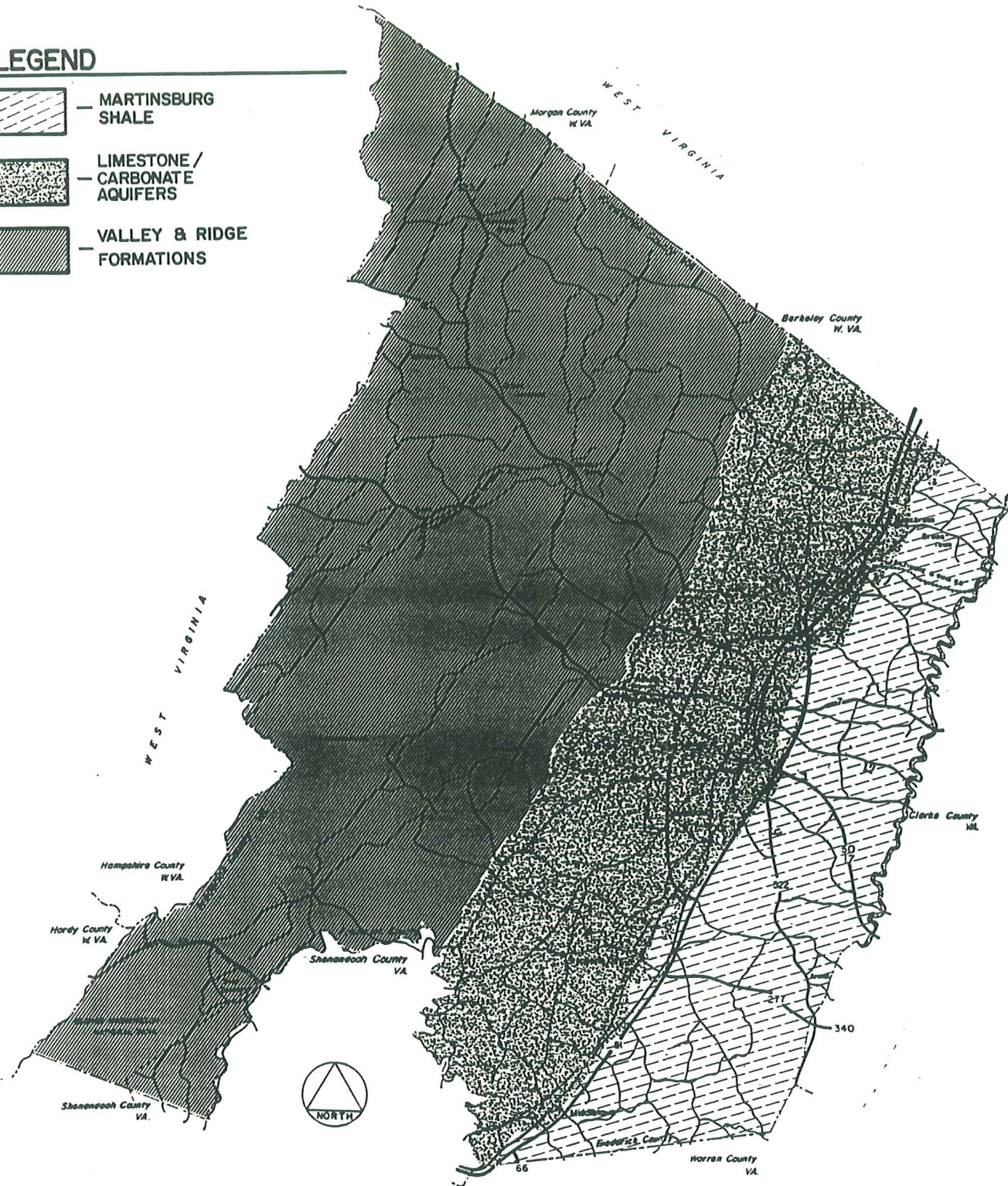
- Steep Slopes
- Floodplains
- Prime Agricultural Soils.

This information can be used to evaluate land to determine general suitability for more intensive forms of development.

In general, the pattern of development that seems to be occurring involves development in the eastern shale belt using public sewer and water facilities.

LEGEND

-  — MARTINSBURG SHALE
-  — LIMESTONE / CARBONATE AQUIFERS
-  — VALLEY & RIDGE FORMATIONS



FREDERICK COUNTY, VIRGINIA
DEPARTMENT OF PLANNING AND DEVELOPMENT

Geologic Formations and Aquifers

Lesser amounts of development have occurred in the limestone belt west of Winchester and Interstate 81. The relatively steep areas in the western portions of the County remain predominately rural.

The three primary areas can be further divided into drainage areas. These drainage areas are physically separate areas that drain into different streams and are separated by drainage divides. The eastern half of the County tends to drain towards the east to Opequon or Cedar Creek. The valley and ridge area tends to drain north towards creeks such as Back Creek. The drainage areas can provide a good basis for planning sewer and water service areas because such service can be provided through the use of gravity flow in a drainage area. The movement of flows between drainage areas requires pumping.

Water Issues

Issues concerning the quality, quantity, use, and protection of water resources are strongly related to land development issues. Water supplies are needed to support development, while surface and groundwater are potentially affected by development activities.

The Virginia State Water Control Board has recently completed a plan for water supplies in the Shenandoah Valley. Major sources of water use in the County are groundwater and the North Fork of the Shenandoah River. The Frederick County Sanitation Authority purchases all of the water it provides in the urban areas from the City of Winchester, which pumps water from the Shenandoah River.

The Shenandoah Water Supply Plan projects that sufficient water resources are available to meet projected local demand through the year 2030. It is projected that by 2010 the Sanitation Authority will have to negotiate with the City to provide more water or will have to find alternative sources. Potential alternative sources include well-fields, impoundments, springs, and abandoned quarries.

Groundwater is the major source of water supply in the rural portions of the County and provides a potential alternative source for the urban areas. Over half of the population of the County relies on groundwater as the sole source of water supply. The most productive aquifers in the County are the limestone-carbonate aquifers.

There is a need to protect the groundwater resources from potential sources of pollution including sewage disposal, hazardous materials users, landfills, underground storage tanks, urban runoff and other sources. Special care should be taken to protect the limestone areas. Urban uses and problem uses should be avoided in the limestone-carbonate areas. Special standards should be used to control uses which potentially pollute groundwater.

On site sewage disposal systems are a particularly widespread potential source of water pollution. These systems are regulated by the Virginia Health Department and by the Virginia State Water Control Board. Special care is needed to insure that such systems are properly located, installed, operated, and maintained. In addition, the County needs to determine what density of development with on site disposal is appropriate in the rural areas of the County.

Community sewer systems, designed to serve particular developments, should not be allowed where higher density development is not expected to eventually occur. Where such systems are allowed, they should be dedicated to a public authority or sanitary district to insure that the facilities are properly operated.

The Virginia Erosion and Sediment Control Act and the County Code require that properties and waters be protected from soil erosion and sedimentation and runoff resulting from development activities. The current standards require that increased stormwater created by development be conveyed to an adequate channel, capable of carrying the maximum storm that will occur on the average once every two years.

There are drainage problems in the urban portions of the County associated with development that has not met these standards. Also, in some cases the two year storm standard may not be sufficient to avoid flooding caused by new developments. State law suggests that localities can develop their own stormwater standards, over and above the state standards, through the development of watershed plans. Such a watershed plan, based on engineering studies, could be used to deal with existing drainage problems and to provide better standards for new development in the urban portions of Frederick County.

Carrying Capacity

The carrying capacity of land refers to the maximum population density that can be supported by an area without degrading the natural environment or without threatening the public health, safety, and welfare. Local land use regulations typically establish maximum densities and intensities at which development can occur. Such densities can be set based upon judgements concerning the capacity of the land to carry such development.

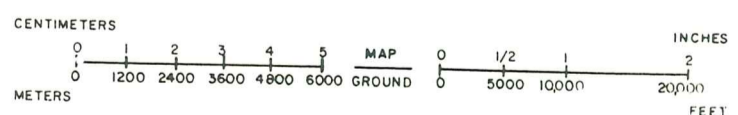
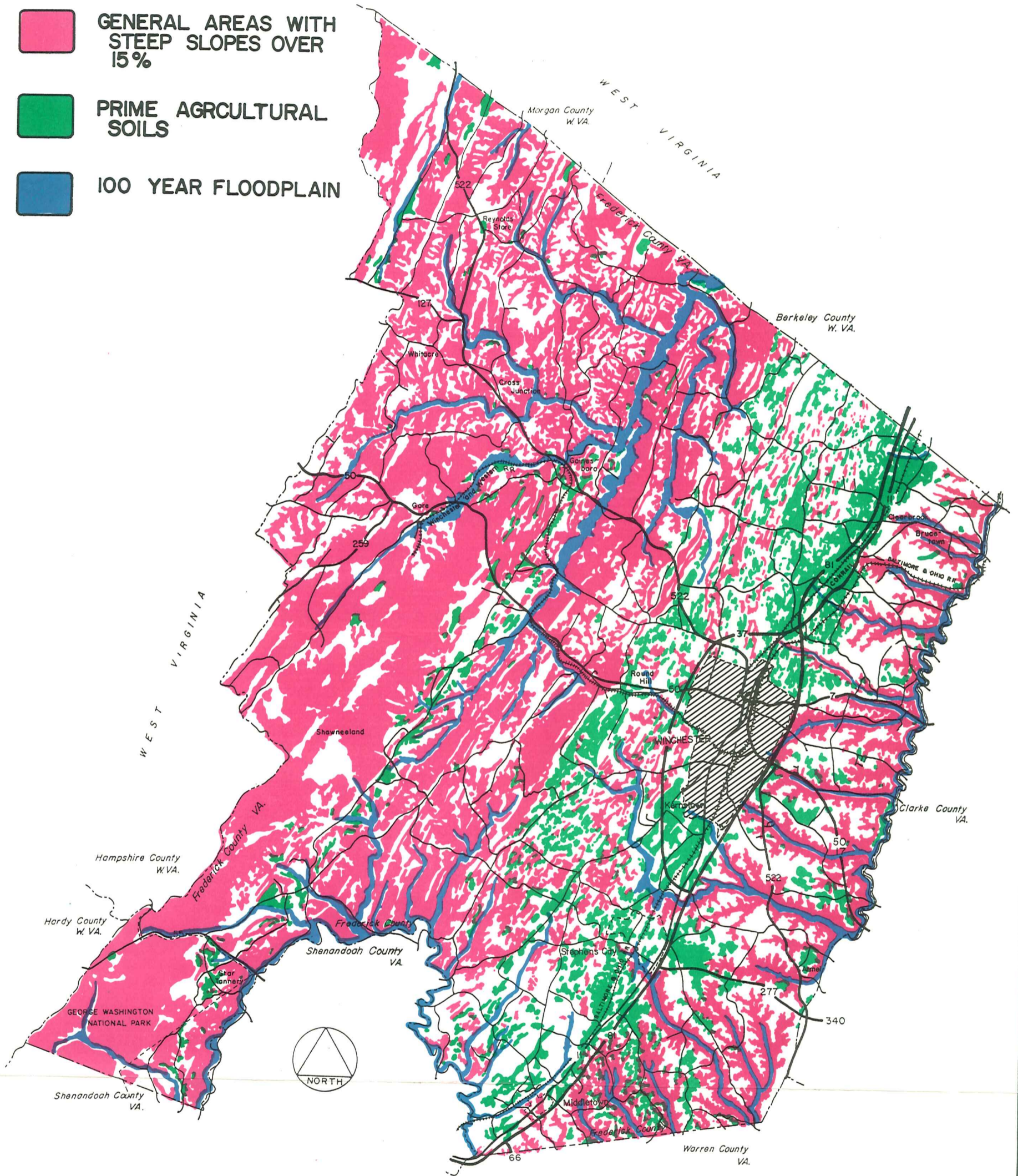
The capacity of the land to carry development in rural areas will depend upon a number of factors, including the following:

- Natural constraints on development, including steep slopes and floodplains,

- The ability of an area to accommodate sewage disposal,

- The need to protect natural resources, including groundwater aquifers and significant agricultural and forestal areas,

- GENERAL AREAS WITH STEEP SLOPES OVER 15%
- PRIME AGRICULTURAL SOILS
- 100 YEAR FLOODPLAIN



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PHYSICAL CHARACTERISTICS

The capacity of rural roads.

The capacity of the land to carry development in urban areas will depend upon a number of factors, including the following:

Natural constraints on development, including steep slopes and floodplains,

The need to protect natural resources, including mature woodland and other open space resources,

The need to provide protections from impacts of development, including increased stormwater runoff,

The capacity of roads, sewerage systems, and other facilities to accommodate development.

Information on such factors is available through a variety of sources and through on-site investigations. Such information should provide a basis for land use planning and should be incorporated into the development review process.

Environmental Protection

The Residential Performance zoning district regulations require that a certain portion of areas with steep slopes, wetlands, floodplains, mature woodlands, and natural stormwater detention areas remain undisturbed in suburban residential areas. Similar requirements should be used to provide environmental protection in other urban areas or in rural areas. Additional requirements are needed to protect sinkholes or limestone areas with thin soils and outcrops in order to protect groundwater. Other requirements can be developed to protect groundwater from urban sources of pollution. Other, similar forms of environmental protection are possible.

Environmental Policy

Issues identified include:

The need to identify and protect important resources,

The need to identify the carrying capacity of land and to plan land use according to that capacity.

The following are the policies proposed to address these environmental issues.

Goal - Protect the natural environment from damage due to development activity.

Strategy 1 - Use performance standards to protect natural features or avoid environmental constraints.

Implementation Methods

1. Review and expand the use of standards which require that certain portions of steep slopes and mature woodland, natural stormwater retention areas, and wetlands remain undisturbed.
2. Avoid development in floodplains. Review floodplain requirements in the land development ordinances.
3. Review ordinances to develop performance standards for protecting sinkholes and areas with limestone outcrops.
4. Review ordinances to develop performance standards for various uses which may threaten groundwater or surface water quality.
5. Undertake a comprehensive watershed management plan for urban areas to deal with existing drainage problems and to develop sufficient stormwater management standards for new development.
6. Strongly encourage and work with state agencies to develop sufficient standards to insure that on site sewage disposal systems are properly located, installed, operated, and maintained.
7. When allowed, require that small community sewage systems in rural developments be dedicated to a public authority. Such systems should not be allowed in areas intended to remain rural into the indefinite future, including rural areas west of Interstate 81.

Goal - Provide for development according to the capacity of the natural environment to carry that development.

Strategy 1 - Use concepts of carrying capacity in general land use planning.

Strategy 2 - Incorporate concepts of carrying capacity in the development review process.

Implementation Methods

1. Continue to develop an environmental database and use that database for general land use planning and zoning decisions. Include information routinely collected by various agencies. Use the database to monitor environmental impacts.
2. Require that information on carrying capacity be included with development proposals and use that information to evaluate such proposals.
3. Undertake an effort to establish appropriate development densities based on carrying capacity factors.

Goal - Identify and protect important natural resources.

Strategy 1 - Identify which natural resources are important and undertake efforts to locate and protect those resources.

Implementation Methods

1. Identify alternate sources of water supply and methods for protecting those resources.
2. Encourage significant agricultural and forestal areas to be included in agricultural and forestal districts.