

Environment



Fairfax County Park Authority

THE ENVIRONMENT

INTRODUCTION

This element provides guidance for achieving a balance between the need to protect the environment, while planning for the orderly development and redevelopment of the County. The objectives and policies listed below have been designed to help decision makers implement policies and regulations regarding the use of land that will conserve and restore a legacy of natural resources.

In order to describe the environmental issues that are relevant to the development and redevelopment of land in Fairfax County and to formulate policies to address those issues, it is appropriate to review the context of environmental planning within this rapidly urbanizing community of 800,000 people. The expectation for the preservation, management, and rehabilitation of meaningful components of the County's environmental heritage should be high, given the large number of people who live here and the importance of local environmental resources to the quality of life.

The opportunities and limitations on what may be achieved through environmental planning are affected by past actions and by the County's function as a home and employment center to a large number of people. Because thousands of acres of forest and agricultural land were converted to urban and suburban development in the 1950s, 60s, 70s, and 80s, the ability to achieve environmental protection goals simply by limiting future development no longer exists. The current scarcity of certain environmental amenities focuses current and future environmental planning efforts on the conservation of remaining resources and the rehabilitation of degraded environments.

BOARD OF SUPERVISORS GOALS

Fairfax County has adopted two goals, "Environmental Protection" and "Open Space", that relate to conservation of the natural environment. These Goals read as follows:

Environmental Protection - The amount and distribution of population density and land uses in Fairfax County should be consistent with environmental constraints inherent in the need to preserve natural resources and to meet or exceed federal, state and local standards for water quality, ambient air quality and other environmental standards. Development in Fairfax County should be sensitive to the natural setting, in order to prevent degradation of the County's natural environment.

Open Space - Fairfax County should support the conservation of appropriate land areas in a natural state to preserve, protect and enhance stream valleys, meadows, woodlands, wetlands, farmland, and plant and animal life. Small areas of open space should also be preserved in already congested and developed areas for passive neighborhood uses, visual relief, scenic value, and screening and buffering purposes.

In addition, three other goals, "Quality of Life", "Land Use" and "Transportation", cite the need to protect the environment. The Fairfax County Goals reflect the belief of the community that environmental protection and preservation are overarching components of the quality of

life. The Goals demonstrate an understanding of the interdependence of decisions regarding private development, transportation, and public works with the environment. Decisions made about the scale, location, and type of human activity on the landscape affect, and are affected by the natural environment.

COUNTYWIDE OBJECTIVES AND POLICIES

Protecting the human and natural environment in Fairfax County is complicated by the many different categories of concerns that are called "environmental". Solving environmental problems is further complicated by the environmental impacts that may result from efforts to resolve other major topical concerns, such as land use, transportation, recreation, and public facility issues. Many topics that have secondary environmental components are considered elsewhere. This Element of the Plan focuses primarily on environmental concerns which impact, or are impacted by, the development of land.

Environmental concerns have been grouped into three broad categories for consideration:

- Environmental pollution,
- Environmental hazards, and
- Environmental resources.

These categories have been selected to recognize that issues pertaining to the environmental impacts of past development, the hazards posed by both human made and natural environmental constraints, and the management of our environmental heritage are somewhat distinct categories.

Many of the environmental policies listed below will be implemented on a case by case basis as land is developed or redeveloped. These policies should be applied as appropriate to both private and public development. Development proposals should not be approved unless and until issues generated by the application of these policies have been resolved.

ENVIRONMENTAL POLLUTION

Our decision to occupy and alter Fairfax County's landscape has resulted in increased volumes and concentrations of specific pollutants in the air, in surface and ground waters, and in the soil. These pollutants can harm both the natural and the human environment.

In recognition of the impacts of human activity on the environment, most existing regulatory authority to protect the environment has been focused on the control of pollution.

Although Fairfax County does not have to contend with the more serious forms of pollution associated with heavy industry, the conversion of land to urban uses and our dependence on the automobile have resulted in unacceptable amounts of pollution.

Air Quality

The County has not attained federal air quality standards for carbon monoxide and ozone.

High ozone concentrations can adversely affect human health. The Washington, D.C. area has not met the Environmental Protection Agency's (EPA) standard for ozone since that standard was established. High ozone concentrations result from the interactions of oxides of nitrogen and hydrocarbons with sunlight. In Metropolitan Washington the generation of ozone is related to the use of the automobile. (See Figure 8.)

High carbon monoxide (CO) concentrations are also harmful to human health. High CO concentrations occur in "hot spots" near points of traffic congestion. Other monitored air quality indicators in Fairfax County comply with state and federal standards.

Objective 1: Preserve and improve air quality.

- Policy a. Establish land use patterns and transportation facilities that encourage the use of public transportation and reduce trip lengths to reduce emissions of oxides of nitrogen, carbon monoxide, and hydrocarbons from automobiles.
- Policy b. Implement transportation strategies that reduce auto travel and improve traffic flow, thereby reducing auto emissions.
- Policy c: Apply state of the art technology toward the reduction of emissions from stationary sources of air pollution.
- Policy d: In cooperation with federal, state and regional agencies, bring Fairfax County into compliance with federal primary and secondary national air quality standards as soon as possible.

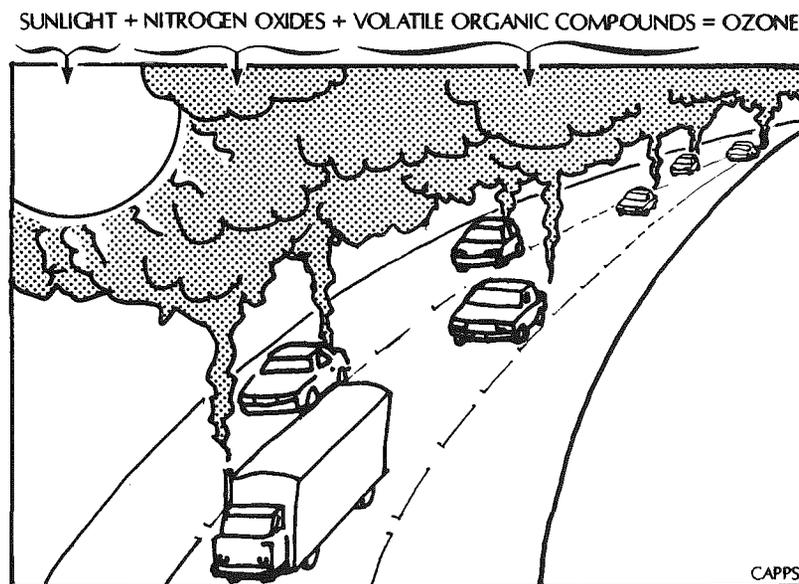


FIGURE 8

Development proposals that are projected to cause a substantial increase in auto related air pollutants should provide a transportation management strategy which minimizes dependence on single occupant automobiles.

Proposals for significant new stationary sources of air pollutants should implement appropriate control technologies.

Water Quality

Some Fairfax County streams and lakes are characterized by poor water quality. The Department of Public Works maintains monitoring stations at Burke Lake, Kingstowne, and Upper Holmes Run to assess the impact of urban development on these streams and lakes. The Fairfax County Health Department routinely monitors surface waters throughout the County for pollutants and water quality indicators such as fecal coliform, dissolved oxygen, phosphorous, and nitrate nitrogen. Fecal coliform concentrations frequently exceed state standards.

The Occoquan Reservoir, one of Fairfax County's principal sources of drinking water, and many smaller impoundments in the County are highly stressed due to the impacts of urban stormwater runoff.

Point source pollution is not currently a problem in the County due to the effectiveness of the sewage treatment plants, and the lack of heavy industry. Care should be taken to anticipate and prevent ground and surface water contamination.

Objective 2: Prevent and reduce pollution of surface waters.

- Policy a. Implement a best management practices (BMP) program for Fairfax County.
- Policy b. Update BMP requirements as newer, more effective strategies become available.
- Policy c. Minimize the amount of impervious surface created as a result of development consistent with planned land uses.
- Policy d. Minimize the application of fertilizers, pesticides, and herbicides to lawns and landscaped areas.
- Policy e. Preserve the integrity and the scenic and recreational value of stream valleys when locating and designing storm water detention and BMP facilities.
- Policy f. Update erosion and sediment regulations and enforcement procedures as new technology becomes available. Minimization of grading shall be a preferred means of limiting erosion.
- Policy g. Encourage, where practical and feasible, the retrofitting of storm water management ponds to become BMPs.
- Policy h. Monitor the performance of BMPs.
- Policy i. Protect water resources by maintaining high standards for discharges from point sources.

Development proposals should implement best management practices to reduce runoff pollution. Preferred practices include; those which recharge groundwater when such recharge will not degrade groundwater quality, those which preserve as much natural open space as possible, and those which contribute to ecological diversity by the creation of wetlands. Regional solutions to stormwater management are preferable to small drainage area, on-site controls.

Programs to improve water quality in the Potomac River/Estuary, and Chesapeake Bay will have significant impacts on planning and development in Fairfax County. There is abundant evidence that water quality and the marine environment in the Bay are deteriorating, and that this deterioration is the result of land use activities throughout the watershed.

In order to protect the Chesapeake Bay and other waters of Virginia from degradation resulting from runoff pollution, the Commonwealth has enacted regulations requiring localities within Tidewater Virginia (including Fairfax County) to designate "Chesapeake Bay Preservation Areas", within which land uses are either restricted or water quality measures must be provided.

The more restrictive type of Chesapeake Bay Preservation Area is known as the "Resource Protection Area (RPA)." With a few exceptions (e.g. water wells, recreation, infrastructure improvements, "water dependent" activities, and redevelopment), localities must prohibit new development in these areas. The Commonwealth is requiring that, at a minimum, the following areas be included within RPAs:

- o perennial streams;
- o tidal wetlands (including tidal shores);
- o nontidal wetlands contiguous with and connected by surface flow to perennial streams or tidal wetlands; and
- o a buffer area not less than 100 feet in width around the above features.

Other areas which "have an intrinsic water quality value due to the ecological and biological processes they perform or are sensitive to impacts which may cause significant degradation to the quality of state waters" may be included at the discretion of local governments.

The other, less sensitive category of land in the Preservation Areas is called the "Resource Management Area (RMA)." Development is permitted in RMAs as long as it meets water quality goals and performance criteria for these areas. These goals and criteria will include stormwater management standards, maintenance requirements and reserve capacity for on-site sewage disposal facilities, erosion and sediment control requirements, demonstration of attainment of wetlands permits, and conservation plans for agricultural activities. Localities, using general guidance provided by the Commonwealth, must define the extent of RMAs.

Objective 3: Protect the Potomac Estuary and the Chesapeake Bay from the avoidable impacts of land use activities in Fairfax County.

Policy a. Comply with the Chesapeake Bay Agreement and the regulations adopted pursuant to the Virginia Chesapeake Bay Preservation Act.

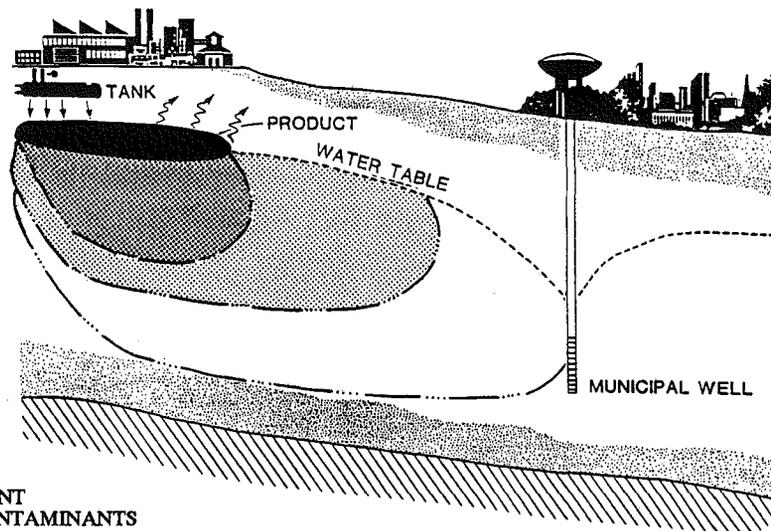
Approximately 18,000 County households rely on private wells for drinking water. The County's well monitoring program is limited. Little is known about the potential for hazardous materials and leaking underground storage tanks to contaminate these wells. (See Figure 9.)

Objective 4: Protect groundwater resources in Fairfax County.

Policy a. Monitor Fairfax County's groundwater resources.

Policy b. Regulate land use activities to protect groundwater resources.

Proposals that include the use or storage of hazardous materials should provide adequate containment facilities, monitoring, and spill prevention strategies to protect surface and groundwater resources.



EXAMPLE OF MOVEMENT
OF GROUNDWATER CONTAMINANTS

Source: Rothschild, Edward R., 1988, "Underground Storage Tank Management," p. 64, in Geraghty and Miller, Inc., 1988, *The Fundamentals of Ground-Water Contamination*, Fall 1988/Winter 1989 Seminar notes.

FIGURE 9

Noise

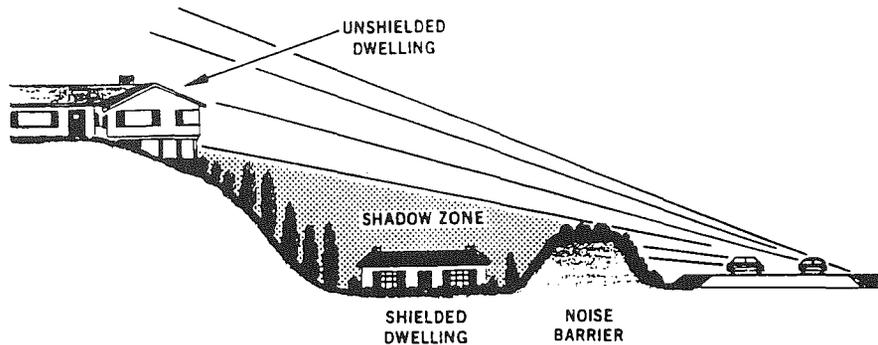
Transportation generated noise impacts the lives of many who live in the County. Some County residents are subjected to unhealthy levels of noise from highway traffic, aircraft operations and railroads, including WMATA's metrorail (See Figure 10). Federal agencies with noise mitigation planning responsibilities have worked with the health community to establish maximum acceptable levels of exposure (Guidelines for Considering Noise in Land Use Planning and Control). These guidelines expressed in terms of sound pressure levels are; 65 dBA Ldn for outdoor activity areas, 50 dBA Ldn for office environments, and 45dBA Ldn for residences, schools, theaters and other noise sensitive uses.

Objective 5: Minimize human exposure to unhealthful levels of transportation generated noise.

Policy a: Regulate new development to ensure that people are protected from unhealthful levels of transportation noise.

Policy b: Reduce noise impacts in areas of existing development.

New development should not expose people in their homes, or other noise sensitive environments to noise in excess of 45 dBA L_{dn} , or to noise in excess of 65 dBA L_{dn} in the outdoor recreation areas of homes. To achieve these standards new residential development in areas impacted by highway noise between 65 and 75 dBA L_{dn} will require mitigation. New residential development should not occur in areas with projected highway noise exposures exceeding 75 dBA L_{dn} . Because noise in recreation areas cannot be screened from aircraft noise, new residential development should not occur in areas with projected aircraft noise exposures exceeding 65 dBA L_{dn} .



EFFECT OF ACOUSTIC BARRIER

Explanatory Note: This figure illustrates the function of an acoustical barrier. The shadow zone indicates a mitigated area that is sheltered by a noise barrier and is therefore relatively quiet.

Source: American Association of State Highway and Transportation Officials, 1985, *Guide on the Evaluation and Attenuation of Traffic Noise*, p. 2.

FIGURE 10

LIGHT POLLUTION

Increasing urbanization requires that care be taken to reduce unfocused emissions of light and that efforts be made to avoid creating sources of glare which may interfere with residents' and/or travelers' visual acuity.

Objective 6: Minimize light emissions to those necessary and consistent with general safety.

Policy a. Recognize the nuisance aspects of unfocused light emissions.

ENVIRONMENTAL HAZARDS

Unlike some parts of the United States, Fairfax County is not subject to major natural disasters such as earthquakes, or major forest fires. However the County is not free of natural and human made hazards to new and existing development.

There are hazards to property in some areas of the County posed by wet or unstable soils. Marine clay soils found in the eastern part of the County and shrink-swell clay soils found primarily in the western area can cause foundation failures, cracked and shifting walls, and in extreme cases, catastrophic slope failure. Asbestos bearing soils may pose a health risk to construction workers requiring special precautions during excavation.

Objective 7: Ensure that new development either avoids problem soil areas, or implements appropriate engineering measures to protect existing and new structures from unstable soils.

Policy a: Limit densities on slippage soils, and cluster development away from slopes and potential problem areas.

Policy b: Require new development on problem soils to provide appropriate engineering measures to ensure against geotechnical hazards.

There is a hazard to people and property posed by potential failure of any one of the several larger dams in Fairfax County. The "Fairfax County Dam Safety Committee" oversees the development of emergency action plans for County owned dams and reviews the emergency plans for private dams. These plans will be activated in the event of a dam failure. Nevertheless, should a dam fail, there is a potential flood impact area down stream of the dam that may put a small number of people and property at risk.

Objective 8: Minimize the exposure of new development to the potential of flood impacts.

Policy a: Prohibit new residential structures within flood impact hazard areas.

Fairfax County is crossed by several major gas and petroleum pipelines. Ruptures of these lines could cause environmental degradation from spillage, or could result in a fire or explosion with the possibility of loss of life.

Objective 9: Minimize the exposure of County residents to potential pipeline ruptures and explosions and avoid hazards from electrical transmission and distribution facilities.

Policy a: Require appropriate construction practices and building setbacks to minimize the hazards associated with gas and petroleum pipelines.

Policy b: Regulate new development to minimize unnecessary human exposure to unhealthful impacts of low level electromagnetic fields from electrical transmission lines.

ENVIRONMENTAL RESOURCES

The third category of environmental issues addresses the protection, preservation, and restoration of environmental resources. These issues reflect a need to conserve or restore appropriate examples of the County's rapidly disappearing natural landscape, to protect and manage its ecological resources, and to provide visual relief in the form of natural vegetation between adjacent and sometimes incompatible land uses.

The County continues to lose open space, much of which has been cumulatively significant for environmental resources. "Open space" land, as distinguished from developed land, includes golf courses, parks, private open space, and vacant land. The quantity of land included within these categories has diminished by 23 percent from 1975 to 1988, and is now less than 86,000 acres. Although not all open space land is ecologically significant or appropriate for preservation, the data suggest a loss of some of Fairfax County's environmental resources, and a fragmentation of remaining ecologically significant land. Large tracts of natural land are especially scarce in the more urban inner part of the County. However, several areas of low density development and some ecologically significant areas remain.

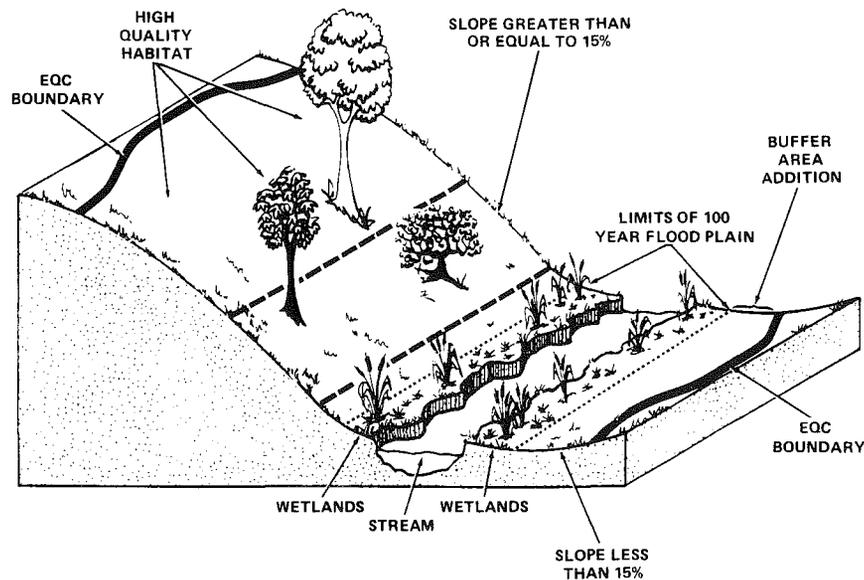
Low density zoning is a valuable conservation tool. However, as a single measure it is not an adequate means to conserve our resources. As currently prescribed in the Zoning Ordinance, neither conventional, nor cluster subdivision regulations are preserving the quality of the landscape that these low density zoning districts were enacted to protect.

It is desirable to conserve a portion of the County's land in a condition that is as close to a predevelopment state as is practical. A conserved network of different habitats can accommodate the needs of many scarce or sensitive plant and animal species. Natural open space also provides scenic variety within the County, and an attractive setting for and buffer between urban land uses. In addition, natural vegetation and stream valleys have some capacity to reduce air, water and noise pollution.

Objective 10: Identify, protect and enhance an integrated network of ecologically valuable land and surface waters for present and future residents of Fairfax County.

Policy a: For ecological resource conservation, identify, protect and restore an Environmental Quality Corridor system (EQC). (See Figure 11.) Lands may be included within the EQC system if they can achieve any of the following purposes:

- **Habitat Quality:** The land has a desirable or scarce habitat type, or one could be readily restored, or the land hosts a species of special interest.
- **"Connectedness":** This segment of open space could become a part of a corridor to facilitate the movement of wildlife.
- **Aesthetics:** This land could become part of a green belt separating land uses, providing passive recreational opportunities to people.



A TYPICAL ENVIRONMENTAL QUALITY CORRIDOR

Source: Fairfax County Office of Comprehensive Planning

FIGURE 11

- Pollution Reduction Capabilities: Preservation of this land would result in significant reductions to nonpoint source water pollution, and/or, micro climate control, and/or reductions in noise.

The core of the EQC system will be the County's stream valleys. Additions to the stream valleys should be selected to augment the habitats and buffers provided by the stream valleys, and to add representative elements of the landscapes that are not represented within stream valleys. The stream valley component of the EQC system shall include the following elements (See Figure 11):

- All 100 year flood plains as defined by the Zoning Ordinance;
- All areas of 15% or greater slopes adjacent to the flood plain, or if no flood plain is present, 15% or greater slopes that begin within 50 feet of the stream channel;
- All wetlands connected to the stream valleys; and
- All the land within a corridor defined by a boundary line which is 50 feet plus 4 additional feet for each % slope measured perpendicular to the stream bank. The % slope used in the calculation will be the average slope measured within 110 feet of a stream channel or, if a flood plain is present, between the flood plain boundary and a point fifty feet up slope from the flood plain. This measurement should be taken at fifty foot intervals beginning at the downstream boundary of any stream valley on or adjacent to a property under evaluation.

Modifications to the boundaries so delineated may be appropriate if the area designated does not benefit habitat quality, connectedness, aesthetics, or pollution reduction as described above. In addition, some intrusions that serve a public purpose such as unavoidable public infrastructure easements and rights of way are appropriate. Such intrusions should be minimized and occur perpendicular to the corridor's alignment, if practical.

Preservation should be achieved through dedication to the Fairfax County Park Authority, if such dedication is in the public interest. Otherwise, EQC land should remain in private ownership in separate undeveloped lots with appropriate commitments for preservation.

When preservation of EQC land is achieved through the development process it is appropriate to transfer some of the density that would otherwise have been permitted on the EQC land to the non-EQC portion of the property to provide an incentive for the preservation of the EQC and to achieve the other objectives of the Plan. The amount of density transferred should not create an effective density of development that is out of character with the density normally anticipated from the land use recommendations of the Plan. For example, town homes should not normally be built adjacent to an EQC in an area planned for two to three dwelling units per acre. Likewise, an increase in the effective density on the non EQC portion of a site should not be so intense as to threaten the viability of the habitat or pollution reduction capabilities that have been preserved on the EQC portion of the site.

- Policy b. To provide an incentive for the preservation of EQCs while protecting the integrity of the EQC system, allow a transfer of some of the density from the EQC portion of developing sites to the less sensitive areas of these sites. The increase in effective density on the non-EQC portion of a site should be no more than an amount which is directly proportional to the percentage of the site that is preserved. Overall site yield will decrease as site constraints increase. Maximum density should be determined according to a simple mathematical expression based upon the ratio of EQC land to total land. This policy is in addition to other plan policies which impact density and does not supersede other land use compatibility policies.

The retention of environmental amenities on developed and developing sites is also important. The most visible of these amenities is the County's tree cover. It is possible to design new development in a manner that preserves some of the existing vegetation in landscape plans. It is also possible to restore lost vegetation through replanting. An aggressive urban forestry program could retain and restore meaningful amounts of the County's tree cover.

Objective 11: Conserve and restore tree cover on developed and developing sites. Provide tree cover on sites where it is absent prior to development.

- Policy a: Protect or restore the maximum amount of tree cover on developed sites consistent with planned land use and good silvicultural practices.
- Policy b: Require new tree plantings on developing sites which were not forested prior to development and on public rights of way.

ENVIRONMENTAL COORDINATION

Fairfax County has many regulations and policies designed to protect the environment and conserve our ecological resources. If the objectives discussed above are implemented, there will be more. Environmental coordination is a remaining area of concern. In the final analysis, an environmental policy or a regulation that applies to development will only achieve the desired effect if it is identified at the time of application review, enforced during development, maintained after development is over, and monitored for continued performance.

Fairfax County does not have an integrated environmental management program. The responsibility for environmental planning, monitoring and enforcement is spread throughout the County government. This administrative structure has resulted in a fragmented and inconsistent application of resources to environmental protection in Fairfax County. For example, several different County agencies are responsible for environmental monitoring. Many of these monitoring programs are quite modest. There is no central data base regarding environmental pollution. The individuals responsible for enforcing environmental regulations often have many additional enforcement responsibilities.

Objective 12: Improve the identification and mitigation of environmental impacts, and the monitoring and enforcement of environmental policies as applied to land disturbing activities.

Policy a: Require both public and private development proposals to identify environmental constraints and opportunities and demonstrate how environmental impacts will be mitigated.

Policy b: Establish a centralized environmental planning and monitoring function with responsibility for coordinating the actions of individual county agencies to effect a comprehensive program to preserve and improve the environment.