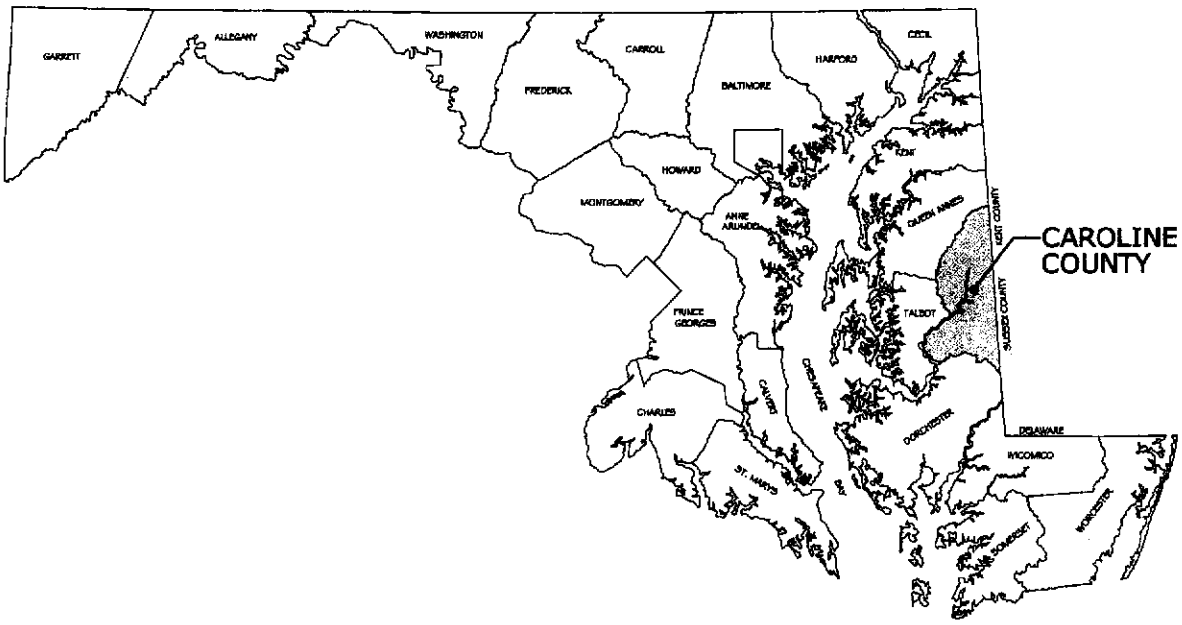
CAROLINE COUNTY

MULTI-HAZARD



MITIGATION

PLAN

Prepared By: S&S Consulting, LLC

August 2005

STATE OF MARYLAND
MILITARY DEPARTMENT

ROBERT L. EHRLICH, JR.
GOVERNOR
MICHAEL S. STEELE
LIEUTENANT GOVERNOR

BRUCE F. TUXILL
MAJOR GENERAL, MDANG
THE ADJUTANT GENERAL
JOHN W. DRONEBURG, III
DIRECTOR

MARYLAND EMERGENCY MANAGEMENT AGENCY
State Emergency Operations Center, Camp Fretterd Military Reservation
5401 Rue Saint Lo Drive, Reisterstown, MD 21136
(410) 517-3600 • Fax (410) 517-3610 • Toll Free 1 (877) 636-2872
TTY Users: 1 (800) 735-2258

September 23, 2005

Mr. Gene Gruber
FIM Director, FEMA Region III
One Independence Mall, Sixth Floor
615 Chestnut Street
Philadelphia, PA 19106-4404

Attention: Joseph Zagone

Dear Mr. Gruber:

The Maryland Emergency Management Agency (MEMA) has reviewed the Caroline County Hazard Mitigation Plan and determined that the local mitigation plan requirements articulated in 44 CFR 201.6 have been satisfied. An original copy of this document is enclosed. This multi-jurisdictional plan was adopted by Caroline County, Denton, Federalsburg, Goldsboro, Henderson, Hillsboro, Marydel, Ridgely, and Templeville. At this time, FEMA review and approval of the plan is requested.

Thank you for your continued support of mitigation in Maryland. Please feel free to contact me at 410-517-5108 with any questions or concerns.

Sincerely,

Russell J. Strickland
Deputy Director
Maryland Emergency Management Agency

cc: Cindy Towers, Assistant Director, Caroline County Emergency Management Agency

RESOLUTION #2005-018

ADOPTION OF CAROLINE COUNTY MULTI-HAZARD MITIGATION PLAN

IT IS HEREBY RESOLVED BY THE COUNTY COMMISSIONERS OF CAROLINE COUNTY, MARYLAND, THAT THE ATTACHED PLAN, WHICH IS INCORPORATED INTO THIS RESOLUTION BY REFERENCE, IS HEREBY PROMULGATED AS THE OFFICIAL CAROLINE COUNTY MULTI-HAZARD MITIGATION PLAN.

THIS PLAN HAS BEEN FORMULATED TO COMPLY WITH ALL APPLICABLE STATE AND COUNTY REGULATIONS.

FURTHERMORE, THIS PLAN SUPERSEDES ALL PREVIOUS COUNTY PLANS.

ADOPTED/EFFECTIVE: AUGUST 9, 2005

ATTEST:

Leigh Sands
Executive Assistant

Bryan Ebling, Director,
Caroline County Department of
Emergency Management

(SEAL)

COUNTY COMMISSIONERS OF CAROLINE COUNTY, MARYLAND

John W. Cole, President

Roger L. Layton, Vice President

Mario J. Gangemi, Commissioner

STATE OF MARYLAND
CAROLINE COUNTY
FILED FOR RECORD
At 10:30 o'clock am
On 8-15 2005 And
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RESOLUTION OF ADOPTION NUMBER 667

ADOPTING the Caroline County, Maryland Multi-Hazard Mitigation Plan

WHEREAS, THE TOWN OF DENTON, A MUNICIPALITY in Caroline County recognizes the threat that natural and technological hazards pose to people and property; and

WHEREAS, an adopted Multi-hazard Mitigation Plan is required as a condition of future funding for hazard mitigation projects; and

WHEREAS, The Town of Denton participated jointly in the planning process with other local units of government within the County to prepare a Multi-hazard Mitigation Plan;

NOW, THEREFORE, BE IT RESOLVED, that the Town of Denton hereby adopts the Caroline County Multi-hazard Mitigation Plan as an official plan; and

BE IT FURTHER RESOLVED, that the Caroline County Department of Emergency Management is authorized to submit on behalf of the participating municipalities the adopted Multi-hazard Mitigation Plan to the Federal Emergency Management Agency for final review and approval.

ADOPTED this 1st day of August, 2005.

DENTON TOWN COUNCIL:

J. Bradford Horsey, Mayor

Carol D. Stockley, Councilperson

Lester L. Branson, Councilperson

John A. Foster, Councilperson

H. Victoria Goldsborough, Councilperson

ATTEST:

Karen L. Monteith
Clerk-Treasurer

RESOLUTION OF ADOPTION 2005-13

ADOPTING the Caroline County, Maryland Multi-Hazard Mitigation Plan.

WHEREAS, Mayor and Council of Federalsburg, A MUNICIPALITY in Caroline County recognizes the threat that natural and technological hazards pose to people and property; and

WHEREAS, an adopted Multi-hazard Mitigation Plan is required as a condition of future funding for hazard mitigation projects; and

WHEREAS, Mayor and Council of Federalsburg participated jointly in the planning process with other local units of government within the County to prepare a Multi-hazard Mitigation Plan;

NOW, THEREFORE, BE IT RESOLVED, that Mayor and Council of Federalsburg hereby adopts the Caroline County Multi-hazard Mitigation Plan as an official plan; and

BE IT FURTHER RESOLVED, that the Caroline County Department of Emergency Management is authorized to submit on behalf of the participating municipalities the adopted Multi-hazard Mitigation Plan to the Federal Emergency Management Agency for final review and approval.

In accordance with Section C3-6, this Resolution shall become effective upon passage by the Mayor and Council and recordation in the Minutes Books.

	YEA/NAY
Betty J. Ballas, Mayor	YEA
Heather Hutson	YEA
Hattie M. Gasser	YEA
D. Scott Phillips	YEA
Phillip S. Gutkin	YEA

I hereby certify that the above Resolution was passed by a yea and nay vote of the Council this 15 day of AUGUST, 2005.

Betty J. Ballas

Betty J. Ballas, Mayor

Delivered by the Mayor and recorded by me in the Minutes Books of the Mayor and Council of Federalsburg this 15th day of AUGUST, 2005.

Shirley A. Greene

Shirley A. Greene, Clerk-Treasurer

TOWN OF GOLDSBORO

RESOLUTION 2005-04

A RESOLUTION ADOPTING CAROLINE COUNTY MULTI-HAZARD MITIGATION PLANS.

WHEREAS, the Mayor and Town Council of Goldsboro, a municipality in Caroline County recognizes the threat that natural and technological hazards pose to people and property; and

WHEREAS, an adopted multi-hazard mitigation plan is required as a condition of future funding for hazard mitigation projects; and

WHERAS, the Mayor and Town Council of Goldsboro, participated jointly in the Caroline County planning process with other local government entities to prepare a multi-hazard mitigation plan; and

NOW, THEREFORE, BE IT RESOLVED, that the Mayor and Town Council of Goldsboro, (Caroline County) Maryland hereby adopt the Caroline County Multi-hazard Mitigation Plan as an official plan; and

BE IT FURTHER RESOLVED, that the Caroline County Department of Emergency Management is authorized to submit on behalf of the participating municipalities the adopted Multi-hazard Mitigation Plan to the Federal Emergency Management Agency for review and approval.

CIRCUIT RIDER/TOWN MANAGER

6/20/05
DATE

MAYOR

Blanche M Bedwell
COUNCIL MEMBER

COUNCIL MEMBER

RESOLUTION NO. 2005-R-13

A RESOLUTION OF THE MAYOR AND COUNCIL OF GREENSBORO ADOPTING THE CAROLINE COUNTY MULTI-HAZARD MITIGATION PLAN AS THE TOWN MULTI-HAZARD MITIGATION PLAN

WHEREAS, the federal Disaster Mitigation Act of 2000 requires that all States and local jurisdictions develop and submit Mutli-Hazard Mitigation Plans to reduce loss during disasters, whether natural and man-made; and,

WHEREAS, each local jurisdiction has the option of developing its own plan or joining in with the County in the development of a plan; and,

WHEREAS, the Town of Greensboro (herein, "Town") has participated in the development of Caroline County's Multi-Hazard Mitigation Plan, which complies with all application State and County regulations, and which identifies public infrastructure within the County and potential hazards associated with each such infrastructure asset, including infrastructure of the Town,

NOW THEREFORE, BE IT RESOLVED BY THE TOWN OF GREENSBORO, that

1. That attached Plan, which is incorporated into this resolution by reference, is hereby promulgated as the Multi-Hazard Mitigation Plan of the Town of Greensboro.

2. That this Multi-Hazard Mitigation Plan supersedes any and all previous mitigation plans adopted by the Town.

Yea or Nay

Gerald P. Garey, Councilman — yea

Alex W. Herzberg, Councilman — yea

David A. Spencer, Councilman — yea

Timothy D. Boyd, Councilman

ATTEST:

Jeannette DeLude, Clerk-Treasurer

Approved:

Thomas L. Riddleberger, Mayor

Date: September 1, 2005

TOWN OF HENDERSON

RESOLUTION 05-01

A RESOLUTION ADOPTING CAROLINE COUNTY MULTI-HAZARD MITIGATION PLAN.

WHEREAS, the Town Commissioners of Henderson, a municipality in Caroline County recognizes the threat that natural and technological hazards pose to people and property; and

WHEREAS, an adopted multi-hazard mitigation plan is required as a condition of future funding for hazard mitigation projects; and

WHERAS, the Town of Henderson participated jointly in the Caroline County planning process with other local government entities to prepare a multi-hazard mitigation plan; and

NOW, THEREFORE, BE IT RESOLVED, that the Mayor and Commissioners of the Town of Henderson (Caroline County) Maryland hereby adopt the Caroline County Multi-hazard Mitigation Plan as an official plan; and

BE IT FURTHER RESOLVED, that the Caroline County Department of Emergency Management is authorized to submit on behalf of the participating municipalities the adopted Multi-hazard Mitigation Plan to the Federal Emergency Management Agency for review and approval.

CIRCUIT RIDER/TOWN MANAGER

DATE 6/24/05

MAYOR

COMMISSIONER

COMMISSIONER

COMMISSIONER

COMMISSIONER

RESOLUTION OF ADOPTION

ADOPTING the Caroline County, Maryland Multi-Hazard Mitigation Plan

WHEREAS, The Town of Hillsboro, A MUNICIPALITY in Caroline County recognizes the threat that natural and technological hazards pose to people and property; and

WHEREAS, an adopted Multi-hazard Mitigation Plan is required as a condition of future funding for hazard mitigation projects; and

WHEREAS, The Town of Hillsboro participated jointly in the planning process with other local units of government within the County to prepare a Multi-hazard Mitigation Plan;

NOW, THEREFORE, BE IT RESOLVED, that The Town of Hillsboro hereby adopts the Caroline County Multi-hazard Mitigation Plan as an official plan; and

BE IT FURTHER RESOLVED, that the Caroline County Department of Emergency Management is authorized to submit on behalf of the participating municipalities the adopted Multi-hazard Mitigation Plan to the Federal Emergency Management Agency for final review and approval.

ADOPTED this Eighteenth day of July 2005

Mayor Ronald A. Stafford
Ronald A. Stafford

Town Clerk Susan E. Seger
Susan E. Seger

RESOLUTION R-12-05

A RESOLUTION OF THE COMMISSIONERS OF RIDGELY TO ADOPT THE CAROLINE COUNTY, MARYLAND MULTI-HAZARD MITIGATION PLAN

WHEREAS, the Commissioners of Ridgely, a municipal corporation in Caroline County, Maryland recognize the threat that natural and technological hazards pose to people and property, and

WHEREAS, an adopted Multi-Hazard Mitigation Plan is required as a condition of future funding for hazard mitigation projects, and

WHEREAS, the Commissioners of Ridgely participated jointly in the planning process with other local governmental units in Caroline County to prepare a Multi-Hazard Mitigation Plan.

NOW, THEREFORE, BE IT HEREBY RESOLVED by the Commissioners of Ridgely that:

Section I. The Caroline County, Maryland Multi-Hazard Mitigation Plan is hereby adopted.

Section II. The Caroline County Department of Emergency Management is authorized to submit on behalf of the Commissioners of Ridgely the adopted Multi-Hazard Mitigation Plan to the Federal Emergency Management Agency (FEMA) for final review and approval.

Section III. This resolution shall take effect this 11th of July, 2005.

Charles W Hunter

Charles W Hunter, Commissioner

Linda D Epperly-Glover

Linda Jo Epperly-Glover, Commissioner

Nancy S Gearhart

Nancy S Gearhart, Commissioner

RESOLUTION OF ADOPTION

ADOPTING the Caroline County, Maryland Multi-Hazard Mitigation Plan

WHEREAS, Templeville, A MUNICIPALITY in Caroline County recognizes the threat that natural and technological hazards pose to people and property; and

WHEREAS, an adopted Multi-hazard Mitigation Plan is required as a condition of future funding for hazard mitigation projects; and

WHEREAS, Templeville participated jointly in the planning process with other local units of government within the County to prepare a Multi-hazard Mitigation Plan;

NOW, THEREFORE, BE IT RESOLVED, that Templeville hereby adopts the Caroline County Multi-hazard Mitigation Plan as an official plan; and

BE IT FURTHER RESOLVED, that the Caroline County Department of Emergency Management is authorized to submit on behalf of the participating municipalities the adopted Multi-hazard Mitigation Plan to the Federal Emergency Management Agency for final review and approval.

ADOPTED this 13 day of June.

Mayor Helen Knotts

Town Clerk Shawn M. Knotts

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CAROLINE COUNTY HAZARD MITIGATION PLAN

INTRODUCTION

In response to continuing large-scale federal outlays of disaster funds to states and communities during the decade of the 1990's, Congress passed the Disaster Mitigation Act of 2000. Section 322 of this Act requires that all states and local jurisdictions develop and submit Mitigation Plans designed to meet the criteria set forth in 44 CFR Parts 201 and 206. The purpose of these plans is to prevent or reduce loss of life and injury and to limit future damage costs by developing methods to mitigate or eliminate damage from various hazards. Beginning in 2002, states were provided funding under this act to carry out the planning process.

In January 2000, the Maryland Emergency Management Agency published the Maryland Hazard Analysis that provides an overview of various hazards which affect the state. These hazards include winter storms, riverine flooding, storm surge, hurricanes, tornadoes, thunderstorms, epidemics, soil movement, drought, extreme heat, hazardous materials, wildfire, fire and explosions and transportation accidents.

Additional funding is being made available to counties to develop Hazard Mitigation Plans for local communities. Each incorporated community has the option of joining with its county government in the preparation of this plan. Local Mitigation Plans will follow a planning methodology that includes public involvement, a risk assessment for various hazards, an inventory of critical facilities and other at-risk structures, a vulnerability analysis, a mitigation strategy for each identified high risk hazard, and a method to maintain and update the Plan.

PLANNING PROCESS

Caroline County chose to develop a Hazard Mitigation Plan meeting the above guidelines and created a Planning Committee composed of representatives from various county and municipal agencies, including Emergency Management, Planning, Health, Public Works, Economic Development, Fire and Police, and Education to review information concerning the hazards that are most likely to affect the County and provide public information to citizens concerning the planning process.

Planning Committee meetings were scheduled to coincide with key phases of the planning process. The first meeting was introductory in nature, to explain the overall process being used in developing the plan. This meeting also included an exercise which allowed each committee member the opportunity to rank various hazards within the county. The second meeting was designed to discuss composite hazard rankings and review hazard profiles. This meeting also included a preliminary review of the vulnerability of various critical facilities in the county. The third meeting concentrated on loss estimates and focused on mitigation actions that the county can take to lessen

damage from each hazard. The fourth and final meeting included a review of the proposed plan and preparation for the required public hearing.

PUBLIC MEETINGS

Two public meetings were scheduled, one to coincide with the review of the draft Plan and the other to coincide with the public hearing for the Plan. Copies of minutes for both the planning committee meetings and the public meetings are included in the Plan Appendix.

MEDIA ANNOUNCEMENTS

Media announcements designed to coincide with the public meeting schedule provide the public with an overview of the planning process and the mitigation measures that are being considered.

MUNICIPAL PARTICIPATION

The ten county municipalities were invited to participate in the planning process and to have their mitigation concerns made part of the county plan. These municipalities are Denton, Federalsburg, Goldsboro, Greensboro, Henderson, Hillsboro, Marydel, Ridgely, Preston and Templeville.

TIMELINE

The timeline for completion of the Hazard Mitigation Plan called for the work plan to be completed in February, 2004; the planning process to be outlined in March, 2004; the risk assessment to be completed by May, 2004; and the mitigation strategy to be completed by June, 2004. The plan was completed in draft form in July, 2004.

CAROLINE COUNTY PROFILE

PHYSICAL LOCATION

Caroline County is located in the central part of the Eastern Shore and is adjacent to Queen Anne's, Talbot and Dorchester Counties in Maryland, and Kent and Sussex Counties in Delaware as shown on Figure 1. Caroline County was founded in 1773 and was named for Lady Caroline Eden, wife of Robert Eden, Maryland's last Colonial Governor, and daughter of Charles Calvert, 5th Lord Baltimore. Caroline is one of the smaller counties in Maryland, containing 325 square miles of land. As shown on Figure 2, Caroline County is located in the Coastal Plain Physiographic Province. The county is situated on the Choptank River and its tributaries, including Tuckahoe Creek, and on the upper reaches of Marshyhope Creek, which flows into the Nanticoke River. These stream basins are shown on Figure 3.

CLIMATE

Because of its nearly level terrain and low elevation (sea level to approximately 75 feet), Caroline County is susceptible to high winds and rain during summer thunderstorms and to some damage from storm surge and wind during the passage of hurricanes either on or near the Eastern Shore. The county is also susceptible to tornadoes that are occasionally spawned by thunderstorms or hurricanes. Precipitation averages between 40 and 48 inches annually as shown on Figure 4. As noted on Figure 5, Caroline County receives on average15-20 inches of snow per year. Most of this snow falls during the passage of the occasional mid-latitude winter storm. Due to its nearly level terrain and its proximity to the Atlantic Ocean, Caroline County receives less snowfall on average than counties to the north and west.

Temperatures usually average a few degrees warmer in Caroline County than on the western shore throughout the year as shown on Figures 6 and 7. According to the USDA publication, Climate and Man, the county has to deal with fog conditions approximately 10-15 times a year, similar to the rest of the Eastern Shore, but much less than in western Maryland as shown on Figure 8. A synopsis of climatic data for Easton, in Talbot County, shown on Figure 9, provides data similar to Caroline County.

GEOLOGY, SLOPE, GROUND WATER AND SOILS

As noted above, the highest elevation in the county is approximately 77 feet above sea level, so steep slopes are virtually nonexistent except along stream channels in Caroline County. The rock units that make up the county's surface are primarily unconsolidated alluvial deposits of relatively recent age as shown on Figure 10. Older coastal plain sediments are found at some depth below this surface and provide the source of most fresh water used in the county. These sediments are recharged primarily from sources on the western shore and are subject to contamination by pollutants both in Caroline County and from areas outside the county. Salt-water intrusion is also possible when aquifers are

drawn down significantly. According to the County Water and Sewer Plan, the Piney Point Aquifer is the primary source for both public and private water supply in the county. This aquifer is within the Cretaceous series shown on the generalized cross-section of the geologic formations on the Eastern Shore on Figure 11. Denton is located near the center of the cross-section where the sediments are nearly 3,000 feet thick.

As shown on Figure 12, most of the soil types in Caroline County are formed on unconsolidated material and are sandy in nature. Low-lying areas are poorly drained and are susceptible to erosion along tidal estuaries such as the Choptank. Where well drained, the soils are well suited for agricultural uses.

TRANSPORTATION

Rt. 404 is the major east-west highway corridor through Caroline County and connects the county with Rt. 50 to the west and Rt. 13 in Delaware as shown on Figure 13. The other major highway is Rt. 313, which runs north-south and connects Caroline County with Rt. 301 in Kent County and with Rt. 50 in Wicomico County. A number of other state highways and county roads connect the county seat in Denton with other municipalities and smaller communities within the county. Other transportation routes include the MDDE Railroad which connects Federalsburg and Preston with the Norfolk Southern Railroad in Delaware. The Ridgely Airpark, which serves the county, is located approximately 10 miles to the north and west of Denton off Rt. 312.

Additionally, Public Assistance Programs provide transportation for elderly, low income, and physically challenged residents using funding provided by the Maryland Department of Transportation and federal grant programs.

Because of its location on the Choptank River, Caroline County has historically been an inland location for small ports for watermen and for barge traffic. A number of landings serve the Choptank and its tributaries as well as the Marshyhope at Federalsburg.

ECONOMIC DEVELOPMENT

Since initial settlement in the seventeenth century, Caroline County has had a predominately agricultural economy. The primary crop was inititially tobacco, then wheat in the late 18th and 19th centuries. Fruit and vegetable production in the late 19th and early 20th century led to a period of prosperity during which the towns experiences rapid development. Currently grains, poultry and vegetables are the principal agricultural products. Since the completion of the Chesapeake Bay Bridge in the mid-1950's this long period of relative stability related to the agriculturally based economy began to change with the increase in tourism and commercial trade related to the steadily increasing flow of traffic crossing the Chesapeake Bay.

Today, Caroline County has an economy that retains much of its past flavor while it attracts new residential growth, particularly in the area near the county seat of Denton,

along the Rt. 313 corridor toward Greensboro, and along the corridor stretching from Tuckahoe Creek to Denton along Rt. 404.

Out of a labor force of 15,045 people, 14,297 were employed in 2000, compared to a labor force of 13,820 in 1990 when 13,229 people were employed. The economy of the county has a great deal of variety with significant employment in the professional and administrative category as well as wholesale and retail trade, manufacturing and construction as shown on Figure 14.

POPULATION

Caroline County's population growth has mirrored the above economic periods with high rates of growth occurring during the early settlement of the county and since 1970. In the 2000 Census report, Caroline County had a population of 29,772, an increase of 2,737 over the 1990 Census as shown on Figure 15. In the year 2000, the incorporated towns had populations ranging from 2,960 in Denton to 80 in Templeville as shown on Figure 15. Total municipal population was 9,854 in 2000, approximately one third of the county total. During that Census year more than 5,700 people lived in the election district surrounding Denton, more than 5,000 lived in the election district surrounding Greensboro, and nearly 4,700 people lived in the election district which includes Federalsburg. A map showing election districts appears on Figure 16.

According to the Maryland Hazard Analysis completed in 2000, Caroline County has a significant number of residents of Hispanic origin and a large number of residents over the age of 65. The U. S. Census for 2000 shows a Hispanic population of 789 in Caroline County and a population of 4,031 for the group 65 and older. The Hispanic population is concentrated in the Henderson area in the northeast part of the County, while the elderly population is concentrated in the Denton and Federalsburg areas.

According to the Maryland Department of Planning, Caroline County's population is projected to grow to 32,050 people by the year 2010 and to 33,850 by 2020. The Caroline County Planning Department projects the county population will grow to 33,030 people by 2010 and to 36,250 by 2020.

HOUSING

According to the U.S. Census, the county's residents were housed in 12,028 units in 2000 of which 250 were constructed in 1999 and 2000. In addition, permits for more than 340 single-family dwellings have been issued by the county in the last two years. In terms of at-risk housing, the Caroline County Planning Department reports there are more than 500 mobile homes in 14 mobile home parks. There are also more than 2000 mobile homes and double-wide mobile homes on individual lots throughout the county. The Maryland Hazard Analysis states that the greatest concentration of mobile homes are in the Census Tracts including Marydel, Henderson, and Goldsboro in the northern part of the County and in the Preston area in the southwest.

The median value of owner occupied housing was $101,700 in 2000 as compared to $75,000 in 1990. Median monthly rents were $482/month in 2000, as compared to $348/month in 1990.

INCOME

The U.S. Census indicates that Caroline County continues to show improvement in its economic condition with a median household income of $27,758 in 1990 increasing to $38,832 in 2000. The poverty rate for the county has remained nearly constant at 9% in 1990 and 2000.

SCHOOL ENROLLMENT

Public school enrollment has been relatively stable in recent years with 5,292 students in 2003. Even though the county's population is projected to increase through the year 2010, school enrollment is projected to decline slightly during the current decade to 5,253 in 2010 according to Caroline County projections.

LAND USE PROFILE

According to the Caroline County Comprehensive Plan updated in 2002, most residential and commercial development is concentrated in the areas within or in close proximity to the municipalities. Projections in that plan call for a continuation of this development style with most new urban development beingin close proximity to existing municipalities through 2010. Countywide land use tabulations from 1983 showed a total of 208,600 acres of land in the county with nearly 6,200 acres being devoted to urban type development. Based on permit records since 2000 that show 150 to 231 new dwelling permits issued county-wide each year it appears reasonable to conclude that another 4,500-5,000 acres have been developed since 1983 in the county. Permits issued in the unincorporated part of the county since 2002 are shown on Plate 17.

Even with this new urban development, the vast majority of land in Caroline County remains in either in agriculture (131,000 acres in 1983) or forest use (71,400 acres in 1983). Approximately 3,400 acres of the forest category is considered tidal wetlands.

MUNICIPAL PERSPECTIVES

The ten municipalities in Caroline County are in large part still the centers for most residential and commercial activity in the county with the exception of the corridor along Rt. 404 between Hillsboro and Denton. The municipalities with water and sewer service should be able to control the pace of development through the provision of these utility services. Those municipalities with water service include Denton, Federalsburg, Preston, Ridgely, Greensboro and Henderson. Since all of these public water service areas depend on ground water supplies there is a great deal of concern about using potable water for fire suppression. One method for limiting the use of potable water for fire-fighting is to use dry hydrants which can be installed at surface water sources, to be

activated during time of need. Those municipalities providing sewer service include Denton, Federalsburg, Preston, Ridgely and Greensboro. The communities of Marydel, Templeville, Goldsboro and Henderson are working with the county in the process of creating a water and sewer district to serve those municipalities with both water and sewer.

POPULATION PROJECTIONS AND LAND USE TRENDS

As noted earlier in the Population Profile, the Caroline County Planning Department projects Caroline County to have a population of 33,030 by the year 2010, and a population of 36,250 by 2020. The County Comprehensive Plan projects that most of the population growth and associated urban development in the county will continue to be centered on designated growth areas in or adjacent to municipalities where a good portion of the land is projected to be served by public water and sewer as shown on Figures 18 and 19. According to the Comprehensive Plan future urban development will most likely follow the water and sewer extensions and be concentrated in the areas near the municipalities as shown on Figure 20.

PREVIOUS AND ONGOING HAZARD MITIGATION EFFORTS

ACQUISITION AND ELEVATION OF HOMES

The Towns of Greensboro and Federalsburg have each engaged in floodplain acquisition projects within the past decade. Greensboro has purchased five houses in the floodplain of the Choptank River, while Federalsburg has purchased two properties in the floodplain of Marshyhope Creek as shown on Figure 21.

FIRE PROTECTION

The Town of Federalsburg also developed a mitigation project to install 10 dry hydrants in Marshyhope Creek and two of its tributaries. This project improved accessibility to water for fire protection and lessened the town's reliance on potable water for fire protection during periods of drought.

COMPREHENSIVE PLAN and LAND USE REGULATIONS

The Caroline County Comprehensive Plan, amended through 2002, includes a number of goals and objectives that promote mitigation activities. This plan also is in compliance with the Maryland Economic Growth, Resource Protection and Planning Act of 1992. That Act requires each county to address seven visions that, in large part, promote hazard mitigation through land use regulation. These visions are designed to concentrate development in suitable areas having existing or planned water and sewer service, protect sensitive areas, including 100-year floodplains and steep slopes, and direct growth to existing population centers.

The Comprehensive Plan Goals include measures designed to meet the above visions. These measures include the provision of adequate environmental safeguards to control and minimize development in floodplain areas and on steep slopes. The plan also calls for measures to control or eliminate environmental health hazards, and calls for measures to provide adequate public safety services. The county Subdivision Regulations, Erosion and Sediment Control Regulations, Stormwater Management Ordinance, Floodplain Regulations, Zoning Ordinance and Municipal Zoning Ordinances all address regulatory measures designed to meet the above visions, goals and objectives.

WATER AND SEWER PLAN

The Water and Sewer Plan shares many of the goals and objectives set forth in the Comprehensive Plan, including the concentration of development in areas having adequate water and sewer service and the elimination or treatment of hazardous pollutants. Requirements for water and sewer service require that utilities be elevated to the base 100-year flood elevation.

BUILDING CODE

During the mid-1990's Caroline County adopted the state-mandated BOCA Building Code. This code contains wind load requirements for new structures tailored to the climate of the county. The code also contains footer depth requirements and tie-down requirements for mobile homes. These requirements are shown on Figure 22. The county had a Building Code Effectiveness Grading Report (BCEGS) completed by the Insurances Services Office, Inc. in 2002 and received a passing score for single family and other structures.

FLOODPLAIN REGULATIONS – FLOOD INSURANCE PROGRAM

Caroline County also has a FEMA approved Floodplain Ordinance that requires the first floor of new structures and additions be elevated one foot above the base flood elevation as shown on Figure 22. Caroline County also participates in the Flood Insurance Program and since 1995 has participated in the Community Rating System program.

REPETITIVE LOSS PROPERTIES

According to the Maryland Department of the Environment, FEMA has not identified any Repetitive Loss properties in Caroline County.

HAZARD IDENTIFICATION AND RISK

MARYLAND HAZARD ANALYSIS

The first step in preparing mitigation strategies for Caroline County involves the identification of various hazards and the risk associated with each hazard. In 2000, the Maryland Emergency Management Agency published the Maryland Hazard Analysis, a document designed to show the probability and impact of various hazards across the state. As shown on the following chart, Caroline County ranked medium-high for the risk of extreme heat, epidemic and major fire/explosion; and medium for the risk of drought, coastal flooding, hurricane, thunderstorm, tornado, winter weather and wildfire. The county ranked low or medium-low for the risk of riverine flooding, soil movement, dam failure, HazMat and transportation accident. Compared to other Maryland counties, Caroline ranked among the highest for the risk of extreme heat and major fire/explosion.

Summary of Risk for Caroline County, MD.
Maryland Hazard Analysis, 2000

HAZARD	High	Medium High	Medium	Medium Low	Low
Drought			X		
Extreme Heat		X			
Riverine Flooding				X	
Coastal Flooding			X		
Hurricane			X		
Thunderstorm			X		
Tornado			X		
Winter Weather			X		
Epidemic		X			
Soil Movement					X
Wildfire			X		
Dam Failure				X	
Fire/Explosion		X			
HazMat				X	
Transportation					X

PLANNING COMMITTEE ANALYSIS

During the preparation of the county's Hazard Mitigation Plan, one of the first steps taken by the county Planning Committee was to perform a Risk Assessment exercise. During this assessment, made during the spring of 2004, extreme heat and riverine flooding were rated as medium-high. The committee rated drought, hurricane, thunderstorm, winter weather, epidemic, fire/explosion and HazMat incidents as medium risks. Coastal flooding, tornado, wildfire and transportation accidents were rated

medium-low, while soil movement and dam failure were rated as low risks. The results of the Planning Committee's assessment are shown on the next chart.

Summary of Risk for Caroline County, MD.
Caroline County Planning Committee, 2004

HAZARD	High	Medium High	Medium	Medium Low	Low
Drought			X		
Extreme Heat		X			
Riverine Flooding		X			
Coastal Flooding				X	
Hurricane			X		
Thunderstorm			X		
Tornado				X	
Winter Weather			X		
Epidemic			X		
Soil movement					X
Wildfire				X	
Dam Failure					X
Fire/Explosion			X		
HazMat			X		
Transportation				X	

COMBINED RISK

By combining the results of the above studies and exercises, and reviewing both probability and impact for various hazards from the Maryland Hazard Analysis, the next chart shows the combined risk for various hazards in Caroline County on a scale of 1 to 10 with 10 being the highest risk. This analysis matches very closely with the Planning Committee rankings, but varies somewhat from the Maryland Hazard Analysis, particularly with respect to riverine flooding, which was rated as a medium-low risk in the state analysis.

Summary of Combined Risk

Type of Hazard	Probability	Impact	Combined Risk
Riverine Flooding	4	4	8
Extreme Heat	4	4	8
Thunderstorm	4	3	7
Major Fire/Explosion	3	4	7
Drought-Groundwater	4	3	7
Hurricane	3	3	6
Severe Winter Weather	3	2	5
Epidemic	2	3	5

HazMat	2	3	5
Tornado	2	3	5
Coastal Flooding	2	3	5
Wildfire	2	2	4
Transportation Accident	2	2	4
Soil Movement	2	1	3
Dam Failure	1	1	2

HAZARD: RIVERINE FLOODING

FLOOD PROFILE:

The FEMA definition for flooding is "a general and temporary condition of partial or complete inundation of normally dry land areas from the overflow of inland or tidal waters or the rapid accumulation of runoff of surface waters from any source." Floods can be caused by the passage of frontal storms, thunderstorms, hurricanes, snow melt or some combination of the above events. According to the Maryland Hazard Analysis, flood damage in the U.S. averages 3.5 billion dollars per year. Between 1983 and 1997 Maryland averaged near $10 million per year in flood damage. Historically, the greatest riverine flooding events in Maryland remain the 1936 flood on the Potomac and the 1972 flood resulting from Hurricane Agnes. Man made activities such as timbering and road building can cause increased runoff that makes downstream areas more susceptible to damage from natural occurring events.

COUNTY PERSPECTIVE:

As shown in the Maryland Hazard Analysis, Caroline County has a composite risk of 2 for both flash flooding and riverine flooding on a scale of 1-5. Based on local experience, however, riverine flooding is ranked as a medium-high risk because of the potential loss of life and possible severe property damage inherent with flooding of roadways and bridges.

Because local climatic conditions can produce large amounts of precipitation at any time of the year, the potential for flooding is not limited to any particular season. Historically, however, most major floods have occurred during heavy thunderstorm activity or in late summer or early fall during the hurricane season.

RIVERINE FLOOD HISTORY:

According to records kept by the U. S. Geological Survey, the central Eastern Shore has been affected by several 100 year flood events since the mid 1960's and by a number of 25-50 year events as shown on Figure 23. Approximate 100 year floodplain areas for major streams are shown on Figure 27 along with the approximate Category 4 Storm Surge Area. While there are only a few gauging stations on the central Eastern Shore, it is safe to say that Caroline County has been affected to some extent by these events. However, due to the county's low elevation and relief, riverine flooding does not cause the same type of problems that it does in areas on the western shore where relief is much more pronounced.

MUNICIPAL PERSPECTIVE:

The towns of Denton, Greensboro and Marydel are located along the floodplain of the Choptank River, while Hillsboro is located on Tuckahoe Creek and Federalsburg is

located on Marshyhope Creek. While these streams are primarily susceptible to storm surge flooding, their upper reaches and tributaries are subject to riverine flooding.

PREVIOUS MITIGATION MEASURES:

As mentioned in the Previous and Ongoing Hazard Mitigation Section, the county and each municipality are subject to Floodplain Ordinances which establish criteria for new development in the floodplain of mapped streams and Stormwater Management Ordinances which prescribe controls for runoff in newly developing areas. These measures are noted on Figure 22.

HAZARD: EXTREME HEAT

EXTREME HEAT PROFILE:

According to the National Weather Service, when temperature and humidity together exceed certain levels (85 degrees and 100 % humidity, 90 degrees and 70% humidity, or 110degrees and 30% humidity) heatstroke is likely if exposure continues for many hours. Such conditions, which can create a heat index temperature of 105 degrees F or greater are encountered in Maryland virtually each summer. For example, Baltimore normally has 32 days per year with temperatures over 90 degrees while the humidity is in the 70% range, while Frederick normally has 33 days per year with temperatures in the 90's but the relative humidity is in the 60-65% range.

COUNTY PERSPECTIVE AND HISTORY:

As noted in the County Profile, Caroline County normally averages close to the same temperature and humidity during the summer months as Baltimore and Washington D.C. This translates into a similar number of days in inland areas (30-35) per year with a heat index above 105 degrees F. According to the Maryland Hazard Analysis, Caroline County has a composite risk for extreme heat of 4 on a scale of 1-5. The county Planning Committee essentially agrees with this ranking, and urges caution on days when the heat index approaches 105 degrees.

MUNICIPAL PERSPECTIVE:

As is the case with most weather related hazards, the municipalities in Caroline County generally face the same risk for extreme heat as does the county.

PREVIOUS MITIGATION MEASURES:

Due to the relatively high number of extreme heat days when the humidity is high along with temperatures over 90 degrees F, it is recommended that citizens follow the heat index warnings issued by the National Weather Service.

HAZARD: THUNDERSTORM-LIGHTNING

THUNDERSTORM PROFILE:

Thunderstorms are usually high intensity storms of short duration originating in a warm moist air mass that either is forced to rise by mountainous terrain or by colliding with a cooler dense air mass. The process of convection in the atmosphere brings about the release of moisture from the warm air mass as it rises, cools and condenses. This condensation proceeds until most of the moisture in the air mass has been precipitated. Since the motion of the air is nearly vertical, and attains high velocities, rainfall is intense and generally concentrated over a small area in a short time frame. Thunderstorms can be 10-15 miles in diameter and normally last 20 to 30 minutes. Lightning, high winds, and occasionally tornadoes are associated with thunderstorms.

When wind speeds exceed 58 mph, thunderstorms are considered severe. According to the Maryland Hazard Analysis, a downburst or sudden descent of cold air during a severe thunderstorm can result in straight line winds up to 134 mph. One of the most extreme hazards from thunderstorms is a lightning strike. Lightning has been known to strike up to 6-10 miles from the storm in an area of clear sky. It is estimated that more than 30,000,000 points on the ground in the continental 48 states are hit by lightning in a single year.

COUNTY PERSPECTIVE AND HISTORY:

According to the Maryland Hazard Analysis, Caroline County's composite risk for thunderstorms is 3 on a scale of 1-5. Based on local experience with flash flooding and high winds the local Planning Committee has ranked thunderstorms as a medium high risk. Caroline County is affected primarily by thunderstorm activity through the interaction of warm and cool air masses along frontal systems. Thunderstorms are more common in the spring when frontal zones are passing over the county from west to east and during the summer months when warm, moist air is lifted over the eastern shore by differential heating of the land and surrounding water. Intense thunderstorms can result in rapid runoff, particularly in the headwaters of small stream basins. In urban areas runoff from stormwater can be a problem for downstream property owners when new construction occurs upslope from inadequate stormwater management facilities in older developed areas. Locally, runoff during severe thunderstorms causes problems at various roads and bridges along the Choptank including River Road near North Caroline High School.

MUNICIPAL PERSPECTIVE:

The municipalities in Caroline County face the same threat from thunderstorms as the county. In some cases inadequate stormwater management facilities in older communities contributes to damage from flash flooding in low lying residential areas

downslope from new construction. In particular, streets in Greensboro near the Choptank are susceptible to flooding as are sections of Federalsburg along Marshyhope Creek.

PREVIOUS MITIGATION MEASURES:

As mentioned in the Riverine Flooding Profile, the County and its municipalities enforce Floodplain Ordinances in mapped floodplain areas which are prone to thunderstorm runoff and the County requires a setback from unmapped streams. In addition, the Stormwater Management Ordinances require storage and release of runoff at predetermined rates in newly developing areas. The County has also installed adequate size drainage pipes at a number of problem sites.

HAZARD: MAJOR FIRE/EXPLOSION

FIRE/EXPLOSION PROFILE:

In this document, fire/explosion refers to a major incident involving a commercial/industrial or transportation fire or explosion. Fire is defined as the state, process, or instance of combustion in which fuel or other material is ignited and combined with oxygen, giving off heat, light and flame. An explosion is defined as an expansion with violent force of materials through a chemical change or through decomposition. As noted in the Maryland Hazard Analysis, more than 8,700 fires and 4 explosions occur each year in the state with a damage toll of more than $15,000 per event. In fact, the field of Emergency Management came into being as a way to coordinate fire control activities. Fire insurance itself dates to attempts to alleviate the damage from fires during the early settlement of the colonies in New England.

COUNTY PERSPECTIVE AND HISTORY:

Caroline County is no different than other rural counties throughout the country, having a network of volunteer fire companies whose primary role historically has been to suppress fires and minimize damage to life and property as a result of these fires. Although Caroline County has had few major fires, several commercial fires that stand out in recent years include a fire at Choptank Electric and a fire at a yacht building facility. According to the Maryland Hazard Analysis, Caroline County has a composite risk of 4 for a major fire and explosion on a scale of 1-5. The county Planning Committee agrees with this risk

MUNICIPAL PERSPECTIVE:

All municipalities in Caroline County share the threat of fire to commercial, industrial or other structures. Federalsburg and Preston face the threat of fire or explosion from a railway transportation incident while Denton, Greensboro, Goldsboro and Federalsburg share the possibility of a transportation incident along major highways including Rts. 404 and 313. Due to the age of structures and less building setback in older communities, the threat of fire spreading to other structures is greater than in newly developing areas.

Those municipalities providing fire suppression from public water supplies include Denton, Federalsburg, Preston, Ridgely, Greensboro and Henderson. According to the County Water and Sewer Plan, the town of Henderson had a public water system installed during the mid 1990's which included fire hydrants. The town of Greensboro had two active wells, a .200 MG tank, and a new .150 MG storage tank and new fire hydrants. The town of Preston installed a new .150 MG storage tank in 1991 and had a new well drilled to provide additional water at the same time. The town of Federalsburg has two active wells and two new storage tanks holding a combined .45 MG of water. The town of Ridgely installed a new .200 MG tank in 1985 and installed new fire hydrants at the same time. The town of Denton has a total storage of .480 MG of water supplied by three active wells. All of the municipalities have been working to replace

undersized lines and plan to have lines of 6" or greater diameter in all areas equipped with fire hydrants. So far as water pressure for fire suppression is concerned, the county Water and Sewer Plan notes that most of the municipalities have problems with pressure within their systems and that during periods of drought, water storage is inadequate.

PREVIOUS MITIGATION EFFORTS:

As noted earlier, most early efforts at hazard suppression revolved around fire. Caroline County has volunteer fire companies that cover the urban and rural areas of the county. Most of these companies date to the early 20th century when vehicles became available that could cover the distance from a fire station to the fire scene in a relatively short period of time. Over the years, training standards and improved methods of fire fighting have been developed by the Maryland Fire and Rescue Institute and implemented at the local level. The Maryland Fire Marshal's office provides expertise in tracing the origins of fires and explosions at the local level. Educational efforts alerting property owners to fire prevention measures are transmitted through the Emergency Management Agency. Additionally, the state mandated Building Code requires certain fire mitigation measures during construction or renovation of buildings.

As noted in the Municipal Perspective section, all the municipalities in Caroline County either have replaced undersized water lines or are planning to replace these lines in the future. As noted in the section on Mitigation Efforts, the town of Federalsburg has installed 10 dry hydrants at a number of locations on Marshyhope Creek and its tributaries to provide improved fire protection and to relieve the use of potable water during times of drought.

HAZARD: DROUGHT

DROUGHT PROFILE:

A drought is essentially a deficiency of precipitation over a period of time resulting from a weather pattern that brings no moisture into an area. Droughts may be short term (a few weeks to a month) or long term (several months to several years). A long term drought may be interrupted by occasional precipitation without breaking the drought cycle. The midwestern states are prone to cyclic long term droughts that last several years. Beginning in 1930, the states in the Great Plains began a long term drought that lasted most of the decade of the 1930's and led to the abandonment of farms and ranches on a scale not seen in this country since that time. According to the Maryland Hazard Analysis, this same drought affected Maryland in 1930 and early 1931. During the 15 months from December 1929 through February 1931, rainfall was 21 inches below normal for much of the state. Other drought periods that have affected the state include 1953-56, 1968-71, 1980-83, and 1994-98.

Droughts are measured on the Palmer Index developed by W. C. Palmer in 1965 to measure the departure of moisture from the norm. The index provides measurements of moisture conditions so that comparisons can be made between locations and between time periods in the same location. The index is really a hydrological index rather than a meteorological index because it is based on moisture availability (precipitation, outflow, and storage) over time.

COUNTY PERSPECTIVE AND HISTORY:

As shown in the Maryland Hazard Analysis, Caroline County has a composite risk for drought of 3 on a scale of 1-5. The county Planning Committee agrees this risk should be medium because some small community water supplies and private wells may be adversely affected by drought conditions. The committee is also concerned about the affect of long-term drought on the county's agricultural community. As shown in the County Profile, Caroline County normally receives 44-48 inches of precipitation per year, above the state average. However, that does not mean the county is immune to drought. During the 1930's, the eastern U.S. received less precipitation and experienced higher temperatures than normal. As noted above, this drought was the longest on record in the state. During the mid-1950's the area endured another prolonged dry spell and has had several shorter droughts in recent decades. More recently, 1999 was a very dry year until the passage of Hurricane Floyd, which brought the precipitation level back to normal for the year. The primary effect of these prolonged dry periods has been felt by the agricultural community. Water supply has also been affected, particularly where ground water is relied on to supply community systems as well as for the agriculture industry which relies on ground water for crop irrigation.

MUNICIPAL PERSPECTIVE

As noted in the County Profile, all municipalities in Caroline County rely on ground water for their supply. Since the aquifers underlying the eastern shore have their recharge areas primarily to the west of the Chesapeake Bay, as shown on Figure 11, localized drought conditions have little affect on the water supply. However, long term draw-down of these aquifers combined with drought on the western shore could adversely affect water supply on the Eastern Shore.

PREVIOUS MITIGATION MEASURES:

Although not specifically aimed at drought mitigation, Caroline County does have a Ground Water Management Program designed to protect groundwater supplies from contamination by septic systems and other pollutants.

Additionally, the town of Federalsburg has installed 10 dry hydrants along Marshyhope Creek to alleviate the use of potable water for fire fighting during periods of drought. These dry hydrants can be installed at existing ponds or streams and provide a way for fire companies to pump water from the stream or pond into a tanker which is then taken to the scene of the fire.

HAZARD: HURRICANE AND COASTAL FLOODING

HURRICANE AND COASTAL FLOODING PROFILE:

According to Strahler's Physical Geography text, a hurricane is essentially a tropical cyclone which develops over oceans in latitudes between 8 and 15 degrees N and S of the equator where the water temperature is normally over 80 degrees Fahrenheit. Warming of the air at low levels creates instability, and along with an easterly "wave" creates a deep circular low pressure area. Once formed, the storm moves north and west in the northern hemisphere. The diameter of a hurricane may be 100-300 miles with wind velocities more than 75 miles per hour and the barometric pressure in the center or eye of the storm commonly falling to 965 mb or lower. Hurricanes are rated for intensity by using the Saffir-Simpson Scale which gives an estimate of the potential damage that a hurricane may cause based on wind speed and surface pressure. This scale, shown in Figure 24, ranges from Category 1 to 5, with Category 1 having winds from 74-95 mph and pressure greater than 980 mb, while a Category 5 hurricane can have winds in excess of 156 mph and pressure of less than 920 mb. Some notable hurricanes that have affected Maryland include Hazel in 1954, Category 4; Donna in 1960, Category 4; Camille in 1969, Category 5; David in 1979, Category 5; Fran in 1996, Category 3; Floyd in 1999, Category 1; and Isabel in 2003, rated at Category 5 at sea, but Category 2 at landfall.

When damages are considered in 1998 dollars, the most expensive recent hurricanes that affected Maryland are Donna at nearly $14,000,000; Camille at $12,700,000; Agnes at $12,400,000; and Hazel at $8,160,000. Because of the extensive storm surge associated with Hurricane Isabel, damages were estimated at $410,000,000 by the Maryland Emergency Management Agency.

Although high winds and excessive amounts of precipitation are common and cause tremendous damage, the most serious effect of hurricanes is coastal destruction caused by storm waves or surge. If a hurricane strikes at high tide, the storm surge can be devastating as was the case in Galveston, Texas in 1900 when more than 6,000 people drowned in a sudden hurricane generated storm surge. In India more than 300,000 people died in 1737 as a result of a 40-foot storm surge accompanying a severe tropical cyclone in the Bay of Bengal. Damage estimates for the 1900 Galveston hurricane topped $30,000,000 in 1998 dollars.

On Maryland's Eastern Shore, particularly on the Bay side, storm surge is also related to rising sea level and to shoreline subsidence. As noted in the County Profile, under the Geology Section, counties fronting on the east side of the Bay are facing shoreline submergence that has been ongoing since the last glacial period when sea level was approximately 400 feet lower than today. While the process has been continuing for approximately 10,000 years, sea level is still rising at a rate of +1 ft or so per century. This rise in sea level will certainly affect the relative height of future storm surge events.

COUNTY PERSPECTIVE AND HISTORY:

According to the Maryland Hazard Analysis, Caroline County has a composite risk of 3 for hurricanes and 3 for coastal flooding on a scale of 1-5. The county's Planning Committee ranks hurricanes as a medium risk and coastal flooding as a medium-low risk. However, when considering both probability and impact in light of the recent passage of Hurricane Isabel, it seems prudent to rank both risks as medium because of the high winds and potential storm surge that can occur on the Choptank River and on Marshyhope Creek during the passage of a hurricane. Caroline County has been affected over the years by the passage of hurricanes as shown on Figure 25, including an unnamed hurricane in 1929, Hurricane Hazel in 1954, Hurricane Connie in 1955, Hurricane Floyd in 1999, and most recently, Hurricane Isabel in 2003. As shown on Figure 26, hurricanes can affect Caroline County from either the Gulf of Mexico or the Atlantic. Normally the greatest damage results from hurricanes that come ashore in the Tidewater area of Virginia or the Carolina Capes as was the case with Isabel. The Storm Surge area related to the passage of a Category 4 storm as depicted in the Maryland Hazard analysis is shown on Figure 27.

MUNICIPAL PERSPECTIVE:

As with other weather phenomenon, Caroline County municipalities share the same concerns as the county. The towns of Denton and Greensboro face more danger from flooding associated with the passage of a hurricane because of their location partially in the storm surge area of the Choptank River while Federalsburg is partially located in the storm surge area of Marshyhope Creek.

PREVIOUS MITIGATION EFFORTS:

As mentioned in the Hazard Mitigation Section, the Town of Greensboro has acquired five properties in the floodplain of the Choptank River and Federalsburg has acquired two properties in the floodplain of Marshyhope Creek.

Caroline County has adopted a Floodplain Ordinance which establishes criteria for building new structures in the mapped 100 year floodplain. Additionally, the county's Building Code contains requirements for wind loading of new structures and has tie down requirements for mobile homes. These criteria are shown on Figure 22.

HAZARD: SEVERE WINTER WEATHER

WINTER STORM PROFILE:

The typical winter storm in Maryland usually brings heavy snowfall (6+ inches), sleet or freezing rain accompanied by cold temperatures and occasionally high winds. According to the Maryland Hazard Analysis, such a storm usually starts as a mid-latitude depression in the central U.S. and moves north and east between the Appalachians and the east coast. Depending on the speed at which these storms travel and the airmass temperature, heavy amounts of snow, sleet, freezing rain or some combination will be the result. Typically, a winter storm will last for 24 – 48 hours and move out of the area into New England. Then, depending on the controlling air mass, temperatures will continue to be cold and the snow or ice will linger for days or sometimes weeks, or, conversely the temperature will warm quickly and the snow or ice will melt in a short time.

COUNTY PERSPECTIVE:

While the above profile is true for much of the state, in Caroline County winter storms occur with less frequency and are usually less severe in terms of cold temperature, snow accumulation and the amount of time snow is on the ground. As noted in the County Profile, Caroline County normally receives between 15 to 20 inches of snow per season. The county does sometimes receive freezing rain during storms that produce snow to the north and west. Caroline County on average has temperatures in the upper 30's during a typical winter day, but has seen temperatures as low as –10 on rare occasions. Because of the normally warmer temperatures and low snowfall amounts, the Maryland Hazard Analysis shows a composite risk of 3 for winter storms in Caroline County on a scale of 1-5. The local Planning Committee agrees that winter storms should be rated as a medium risk.

WINTER STORM HISTORY:

While each winter season brings with it the possibility of major snow and ice storms, including nor'easters, some winter storms do stand out for their severity and duration. Recent storms that stand out include the winter storm of 1979 that dropped more than two feet of snow on the Eastern Shore in Ocean City, an ice storm in February, 1994 that resulted in widespread power outages in Caroline county, and the President's Day storm in 2003 that resulted in more than 16 inches of snow in Denton. So far as cold weather is concerned, in 1912, temperatures dropped to nearly –20 F over much of the state. During a prolonged cold spell in 1977, much of the Chesapeake Bay froze over for an extended period of time.

MUNICIPAL PERSPECTIVE:

Winter storms in Caroline County are normally widespread and affect the municipalities in much the same way as they do the county in general. There are occasions when ice or

snow may be heavier in one part of the county, but by and large, the towns are similar to the county in terms of winter storm effects.

PREVIOUS MITIGATION STRATEGIES:

Both the State Highway Administration and the County Public Works Department have dealt with the occasional winter storm for many years and are trained and equipped to do so. The county's Department of Emergency Management and the local police, fire and rescue departments are also trained to deal with winter storms and the types of situations that result from these storms.

Additionally, the County's Building Code contains snow loading and wind load requirements for new structures as shown on Figure 22.

HAZARD: EPIDEMIC

EPIDEMIC PROFILE:

According to the Maryland Hazard Analysis, epidemics can be considered as part of a broad hazard category that could be termed "public health emergencies". In addition to disease epidemics, such events can take the form of large scale incidents of food or water contamination, infestations of disease bearing insects or rodents, or extended periods without adequate water or sewer service. Epidemics may also be secondary to some other disaster such as flood, tornado, hurricane or HazMat incident. According to the U.S. Centers for Disease Control, in 1997 Maryland ranked high in terms of sexually transmitted diseases, but low for vaccine preventable diseases such as hepatitis B. The state's Department of Health and Mental Hygiene (DHMH) maintains counts for 69 diseases as reported by health care providers and 62 diseases notifiable by laboratories. The surveillance and reporting of these diseases is the responsibility of the local health department, which investigates and completes reporting both electronically and manually as per DHMH regulations. Notifiable diseases include measles, hepatitis B, AIDS, salmonellosis, giardiasis, malaria, lyme disease and rabies.

COUNTY PERSPECTIVE:

As shown in the Maryland Hazard Analysis, Caroline County has a composite risk of 4 on a scale of 1-5 for epidemics. The county's risk for hepatitis B is 4, salmonellosis is 4, AIDS is 2, TB is 3, lyme disease is 4, animal bites is 4, and giardiasis is 2. The county Planning Committee ranks the risk for epidemic as medium.

MUNICIPAL PERSPECTIVE:

Because the statistics for disease and epidemics are gathered on a county basis, municipalities are included in the overall risk analysis performed by the state.

PREVIOUS MITIGATION MEASURES:

Unlike mitigation strategies for most other hazards, disease and epidemic mitigation measures are handled by the state through the Department of Health and Mental Hygiene. County Health Departments are essentially an extension of the state agency, and any mitigation strategies would have to be addressed at that level. According to DHMH, the state has plans in place to respond to disease outbreaks.

HAZARD: TORNADO

TORNADO PROFILE:

A tornado is defined by Strahler in his Physical Geography Text as a violently rotating column of air extending from a thunderstorm to the ground. Normally thunderstorms and associated tornadoes develop in warm, moist air in advance of strong eastward moving cold fronts in late winter and early spring. Tornadoes can also occur along a "dryline" which separates very warm, moist air to the east from hot, dry air to the west. Both of these scenarios are common in the Central Plains. Under the right temperature and moisture conditions, intense thunderstorms can produce tornadoes in areas of differential heating such as occurs on the Eastern Shore.

As shown on Figure 28 tornadoes can occur in every state, although the mid-west states have by far the greatest potential for this type of event. According to the Maryland Hazard Analysis, the state had 210 tornado touchdowns reported between 1950 and 1998. The most recent large scale tornado outbreak occurred in the vicinity of the town of LaPlata in southern Maryland in 2002.

Tornadoes can be ranked by intensity by using the Fujita Scale devised by Dr. Theodore Fujita at the University of Chicago in 1971. This scale is shown on Figure 24, and is broken into 6 categories from F-0 to F-5. F-0 relates to a tornado having a wind speed up to 72 miles per hour, while an F-5 tornado would have winds up to 318 mph.

COUNTY PERSPECTIVE AND HISTORY:

As shown in the Maryland Hazard Analysis, Caroline County has a composite tornado risk of 3 on a scale of 1-5. The local planning committee believes the risk for a tornado outbreak is at the medium-low level. Between 1950 and 1998 there were 6 reported touchdowns of a tornado in Caroline County as shown on Figure 29. Two of these tornadoes were rated F2 and the other four were rated Class F0 or F1 tornadoes. Since 1998, however, there have been at least two other events reported in the Eastern Shore area including the La Plata outbreak in 2002. The approximate path of the La Plata outbreak is shown on Figure 30.

MUNICIPAL PERSPECTIVE:

As is the case with most other weather related events, municipalities in Caroline County share the same concerns as the county. Because the terrain is essentially flat there is no area of the county that would be sheltered from this type of storm. However, housing units in older municipalities were not subject to the same stringent building codes as newer residential units and may be more susceptible to wind damage associated with the passage of a tornado.

PREVIOUS MITIGATION MEASURES:

While mitigating tornado damage is difficult, Caroline County does have a state mandated Building Code which includes wind loading requirements and tie-down requirements for mobile homes as shown on Figure 22.

HAZARD: TRANSPORTATION AND ON-SITE HAZARDOUS MATERIALS EVENTS

HAZARDOUS MATERIALS PROFILE:

A hazardous material may be defined as a substance or material, which, because of its chemical, physical or biological nature, poses a threat to life, health, or property if released from a confined setting. A release may occur by spilling, leaking, emitting toxic vapors, or any other process that enables the material to escape its container, enter the environment, and create a potential hazard. Several common hazardous materials include materials that are explosive, flammable or combustible, poisonous or radioactive. Related combustible hazardous materials include oxidizers and reactive materials, while toxins produced by etiological (biological) agents are types of poison that can cause disease.

According to the Maryland Hazard Analysis, the release of hazardous materials while in transit is of great concern to the U. S. Department of Transportation. While most hazardous materials are stored and used at fixed sites, these materials are usually produced elsewhere and shipped to the fixed facility by rail car, truck, or onboard ships or barges. While these vehicles are identified by signs denoting the hazard, the possibility of release is present at any time. Hazardous materials are constantly being moved in Maryland on highways, the rail system and on shipping lanes in the Chesapeake Bay and its tributaries. On site use of hazardous materials is particularly evident in the Baltimore area near rail, truck and shipping terminals.

COUNTY PERSPECTIVE AND HISTORY:

Historically, most hazardous materials moving through Caroline County have been on Rts. 404 and 313, and the MDDE Railroad as shown on Figure 13. Additionally, Chesapeake Utilities operates a natural gas pipeline in the southern part of the county. Although the county has had no major hazardous materials incidents in recent years, the county has recorded a number of petroleum spills and some illegal dumping of hazardous materials. According to the Maryland Hazard Analysis, Caroline County has a composite risk of 2 for a transportation hazardous materials incident on a scale of 1-5. The local Planning Committee also rated this hazard as a medium-low risk.

So far as on-site hazardous materials are concerned, Caroline County has a file concerning Hazardous Materials Data Sheets for sites and the materials stored. These sites include a number of industrial and commercial establishments in the Denton area and several sites in other municipalities as shown on Figure 31. The Maryland Hazard Analysis rates on-site hazardous materials in Caroline County at a risk level of 2 on a scale of 1 to 5. The local Planning Committee has also ranked on-site hazardous materials as a medium-low hazard.

MUNICIPAL PERSPECTIVE:

Denton is probably more susceptible to transportation hazardous materials incidents than other municipalities because it is on Rts. 404 and 313, which are the major connecting highways between Rt. 50 and Delaware. On site hazardous materials are limited in number, but are primarily located in or near the municipalities of Denton, Federalsburg, Greensboro, Ridgely and Preston as shown on Figure 31.

PREVIOUS MITIGATION EFFORTS:

Although Caroline County does not have an organized HazMat emergency response team, the county does have a hazardous materials response plan that outlines the County's emergency response to a hazardous materials incident. In addition, the State of Maryland has HazMat capabilities through the Department of the Environment, the Department of Transportation and the Department of Health and Mental Hygiene. These agencies are on call through the Department of Emergency Management.

HAZARD: WILDFIRE

WILDFIRE PROFILE:

A wildfire is defined as any large fire that spreads rapidly and is difficult to extinguish. In the United States more than 2,000,000 acres burn each year as a result of wildfire. Since 1960, more than 6,000,000 acres have been consumed during 8 fire seasons, with more than 8,000,000 acres in 2000, and nearly 7,000,000 acres in 2002. Estimated fire suppression costs for federal agencies topped $1 billion in 2000, and $1.6 billion in 2002. Most of the acreage involved and the accompanying suppression efforts are in the western states on land managed by the U.S. Forest Service, the Bureau of Land Management, the Bureau of Indian Affairs, the U.S. Fish and Wildlife Service and the National Park Service. Unfortunately, in recent years, more private property has been affected by wildfires as urban development encroaches on forest and range land.

As noted in the Maryland Hazard Analysis, wildfires in the state are more limited in extent, with more than 95% burning one acre or less. However, in 2002, fires in Somerset and Dorchester Counties burned more than 2000 acres in each county, and in 1947 more than 5,000 acres burned in Anne Arundel and Baltimore counties. Occasionally brush fires threaten urban development where homes are built in close proximity to forest or brush covered land. As more former agriculture land reverts to brush, this problem will become more prevalent. A recent example of a forest fire threatening residential properties occurred in Allegany County in the late 1990's when a forest fire on Wills Mountain threatened homes built on the ridgetop within the city of Cumberland.

COUNTY PRESPECTIVE AND HISTORY:

Because more than 71,400 acres of Caroline County's land surface is covered by forests, with 3,400 acres having wetland species, wildfire is a major concern. With a substantial amount of forest land owned by the State of Maryland in Tuckahoe State Park and the Idylwild Wildlife Management Area near Marshyhope Creek, the Department of Natural Resources takes a leading role in fire suppression throughout the county. According to records kept by DNR, Caroline County averages about 29 wildfires per year, with 46 fires recorded during 1995, a particularly dry year in the county and throughout the Eastern Shore. Figure 32 shows the number of wildfires in the county each year since 1993.

According to the Maryland Hazard Analysis, Caroline County has a composite risk for wildfire of 3 on a scale of 1-5. The county's Planning Committee rates the risk for wildfires at medium-low.

MUNICIPAL PERSPECTIVE:

All municipalities in Caroline County are near or adjacent to forest land, wetlands or agricultural land. Federalsburg is adjacent to the Idylwild Wildlife Management Area, while Hillsboro is near Tuckahoe State Park. As urban development extends into forest

or brush covered lands the possibility of wild fire in urban areas increases as it does throughout the county.

PREVIOUS MITIGATION MEASURES:

As noted above, the Maryland Department of Natural Resources is the lead agency in forest fire suppression in the State. Through the years, this agency has developed working relationships with local volunteer fire departments and the Department of Emergency Management to suppress and control wildfires. Local police and the Sheriff's office assist with fire suppression and traffic control in fire situations.

As noted earlier, the town of Federalsburg has installed 10 dry hydrants along Marshyhope Creek that can be utilized in the event of wildfire as well as for structural fires. With its close proximity to the Idylwild Wildlife Management Area, this is a valuable resource for fighting wildfires in that Area.

HAZARD: MAJOR TRANSPORTATION ACCIDENT

TRANSPORTATION PROFILE:

In the context of this document, transportation refers to modes of mass transportation including airplanes and railways, as well as shipping on waterways. Major causes of airline crashes are pilot error, mechanical failure and weather. Derailment is by far the leading cause of rail accidents followed by rail-highway crossing incidents. Overall, Maryland has a relatively low rate of major accidents, with an average of 26 air accidents per year and 39 rail accidents per year.

COUNTY PERSPECTIVE AND HISTORY:

According to the Maryland Hazard Analysis, Caroline County has a composite risk of 1 for a major transportation accident on a scale of 1-5. Even though the county has not recorded any major transportation accidents in recent years the local Planning Committee ranked a major transportation accident slightly higher as a medium-low risk. This level of risk is due primarily to the limited number of flights into and out of the Ridgely Air Park and the limited amount of traffic on the MDDE Railroad. County officials do anticipate growth in usage of the Ridgely Air Park and also noted concern that the MDDE Railroad transports a considerable volume of propane to a facility just over the county border in Dorchester county.

Another transportation risk that should be recognized is the County's relatively close location to the Dover Air Force base in Delaware which is less than 25 air miles from Denton and less than 15 air miles from the town of Marydel. While the runways at the base are oriented N-S and NW-SE, Dover has one low altitude flight path over Caroline county.

MUNICIPAL PERSPECTIVE:

The town of Denton probably has the highest risk for a major transportation accident because of the volume of truck traffic on Rts. 404 and 313. The municipalities located on the MDDE Railroad have a smaller risk related to the small amount of rail traffic.

PREVIOUS MITIGATION MEASURES:

Both the Ridgely Airpark and the MDDE Railroad are subject to safety standards set respectively by the FAA and the Railroad Safety Board.

HAZARD: SOIL MOVEMENT

SOIL MOVEMENT PROFILE:

Throughout much of Maryland, when you think of soil movement, you think of landslides and stream bank erosion. In limestone areas or in old mine diggings subsidence is also a problem. However on most of the Eastern Shore, rising sea level presents an entirely different form of soil loss in the form of shore erosion as noted in the County profile in the Geology section.

COUNTY PERSPECTIVE:

According to the Maryland Hazard Analysis, Caroline County has a composite risk of 1 for soil movement on a scale of 1-5. This rating is in large part due to the way of thinking that relates to soil movement on the western shore. The county Planning Committee agreed with this rating. That rating is justified for normal soil movement concerns. However, when viewed from the perspective of rising sea level, the risk should be higher. As noted in the County Profile, Caroline County is underlain by unconsolidated sedimentary rocks that are easily eroded when exposed to wave action.

SOIL MOVEMENT HISTORY:

According to personal observation by long time residents of Dorchester County, on the Chesapeake Bay south of Caroline County, the shoreline in the southern and western part of that county has migrated landward a significant distance over the past 30-40 years. Areas that were once used for agricultural purposes in the southern part of the county are now wetlands and appear to be significantly lower than 30-40 years ago. While the wetland area of Caroline County is not anywhere as extensive as in Dorchester County, the concerns about shoreline migration and the conversion of agriculture land to wetlands should be similar in both counties.

MUNICIPAL PERSPECTIVE:

The same submergence that affects the County also has the potential to affect the municipalities. Parts of Denton and Greensboro are within the present storm surge area of the Choptank River in the central part of the county, while Federalsburg is on the edge of the storm surge area along Marshyhope Creek. Any rise in sea level will likely affect these communities adversely with respect to storm surge.

PREVIOUS MITIGATION MEASURES:

Perhaps the most important mitigation measures taken by the county with respect to soil movement are the enforcement of Floodplain Regulations, sediment control and stormwater management measures. While these measures do little to address the problem of rising sea level, sediment control measures do help to minimize the loss of soil that is disturbed during construction projects. Additionally, the local Soil Conservation District

has undertaken many projects since the early 1960's with Public Drainage Associations that help to alleviate soil loss.

HAZARD: DAM FAILURE

DAM FAILURE PROFILE:

Dam failure refers to a collapse, overtopping, breaching or any related condition that causes downstream flooding. Approximately one-third of all dam failures are caused by overtopping due to inadequate spillway capacity, one-third are caused by seepage through or under the structure, and the remainder from improper design or construction or because of earthquake or landside events which trigger the failure of the dam. Examples of dam failure in the United States include the Johnstown Flood in 1889 resulting in 2,209 deaths, the Saugus, California dam collapse in the Los Angeles Aqueduct system in 1928 resulting in 450 deaths, and the Teton Dam breach on the Snake River in Idaho during a flash flood in 1976 resulting in 11 deaths. During Hurricane Agnes in 1972, concern about the Conowingo Dam on the Susquehanna River led to the opening of all flood gates to release pressure when the water level was three feet higher than the dam's rated capacity.

COUNTY PERSPECTIVE AND HISTORY:

According to the Maryland Hazard Analysis, Caroline County has 7 dams, none of which are rated as high hazard dams. The state Hazard Analysis rates Caroline County's composite risk for dam failure at 2 on a scale of one to five. The county's Planning Committee believes the risk for dam failure is low.

MUNICIPAL PERSPECTIVE:

Federalsburg is the only municipality in the County that is located downstream from any impoundments of significant hazard. Lake Chambers on the Tanyard Branch of Marshyhope Creek is located on the east side of Federalsburg near Rt. 306, while Smithville Lake is located upstream of Federalsburg on Marshyhope Creek.

PREVIOUS MITIGATION EFFORTS:

All dams are subject to inspection by the state through its Dam Safety Program, and by the Corps of Engineers.

COMMUNITY CAPABILITY

GENERAL OVERVIEW:

Through its Department of Emergency Management, Caroline County is working to enter into the Maryland MEMAC, a statewide mutual aid agreement to mitigate and respond to a variety of hazards. This network includes state agencies such as the Maryland State Police, Department of Natural Resources, Department of the Environment, Department of Health and Mental Hygiene, State Highway Administration and the Maryland Emergency Management Agency.

The county has written mutual aid agreements with Talbot, Queen Anne's and Dorchester counties and a verbal agreement with Kent County, Delaware. The county has also developed working relationships with volunteer organizations including the fire and rescue units that are active in incorporated communities and in rural areas. Fire and rescue units and their service areas are shown on Figure 34. The County also works with the American Red Cross and other groups, such as the Talbot County Haz-Mat team, that may be called upon in special circumstances. In addition, the county works with private utility companies, including Conectiv Power, Choptank Electric and Verizon, to coordinate mitigation activities.

Through its Planning and Zoning Office, Caroline County has developed a system to regulate land use in sensitive areas, including 100-year floodplains, stream buffer areas, wetlands and Critical Areas. The county also has subdivision regulations for the creation of new lots and a zoning ordinance. Most municipalities have similar regulations that are administered locally.

WEATHER RELATED EVENTS

WINTER STORM CAPABILITY:

As noted in the Introduction, Caroline County normally receives 15-20 inches of snow annually. The Public Works Department, the School Board and local municipalities, along with the State Highway Regional Office are equipped to deal with the occasional snow storm or ice storm during the winter months.

In addition to the Public Works Department and State Highway Administration, the Department of Emergency Management has close ties with Conectiv Power, Choptank Electric and Verizon which provide electrical and telephone service to the citizens of the county. These utility companies clear dead or overhanging trees from utility rights-of-way during summer months so that ice and wind damage is lessened during winter storms.

With respect to new construction, the county's Building Code has snow loading and wind loading requirements.

COASTAL AND RIVERINE FLOODING - HURRICANE AND TORNADO CAPABILITY:

During major weather events, including thunderstorms, tornadoes and the passage of hurricanes, most of the agency and volunteer groups mentioned in the General Overview are called upon for assistance by the Department of Emergency Management. Caroline County's capabilities are similar to other counties that deal with hurricanes and storm surge flooding. Usually local roads are blocked to some extent and when warranted, residents are asked to evacuate from the storm surge area.

The Department of Emergency Management has a plan which coordinates evacuation activities with the Public Works Department and State Highway Administration and with local police, fire and rescue units, the Health Department and the Red Cross. While Caroline County makes a great effort to mitigate flood events, the character of the natural environment, with the storm surge inundation area, lends itself to further mitigation efforts, particularly that of moving people and structures from harm's way.

The county also has the capability to mitigate future flood losses through its Subdivision Regulations, its Floodplain Management Ordinance and its Building Code. The Floodplain Ordinance requires that the first floor of new structures be 1 foot above the base flood level in the storm surge area. The Building Code has wind loading requirements for new structures and tie-down requirements for mobile homes. As noted in the section on Previous Mitigation Efforts, the county participates in the Flood Insurance Program to allow property owners to purchase insurance through this federally sponsored program, and also participates in the Community Rating System Program.

HEAT AND DROUGHT CAPABILITY:

As noted in the Hazard Profile, heat and drought can occasionally be a severe problem in Caroline County. When dry conditions disrupt water service in an area of the county, the Department of Emergency Management can request the Maryland Emergency Management Agency to ask the Maryland National Guard to provide temporary water storage tanks. Additionally, the Health Department monitors well development through the building permit process and has access to well records through the Department of the Environment to monitor ground water use and replenishment. The Department of Agriculture also monitors soil moisture conditions and provides farmers with information on crop development through the Soil Conservation District during low soil moisture conditions.

EPIDEMIC CAPABILITY:

As noted in the Epidemic Profile, the Maryland Department of Health and Mental Hygiene administers the County Health Department. This administrative setup allows the full capabilities of the state to be utilized to mitigate an epidemic or other outbreak of disease in Caroline County.

TECHNOLOGICAL OR OTHER EVENTS

FIRE OR EXPLOSION:

As noted in the Fire/Explosion Profile, Caroline County developed its fire and rescue capability as a response to fire hazard early in the 20th Century. More recently, fire prevention measures such as regulatory requirements mandated through the county's Building Code and the dissemination of public information through the State Fire Marshall's office have become the norm. Safety requirements for explosive materials in containers being shipped by rail or truck are enforced by the Department of Transportation.

The County is also working with municipalities that have water systems to bring these systems up to a common standard in terms of hydrant pressure and flow capacity. The municipality of Federalsburg has installed dry hydrants along Marshyhope Creek to reduce its reliance on the municipal system in the event of fire. In the future, the use of dry hydrants should be considered in all areas having public water service in order to reserve potable water for other uses.

WILDFIRE:

The Department of Natural Resources is the lead agency in wildfire suppression and works with local fire departments in training related to wildfire suppression. In addition, the Department of Natural Resources has strict requirements for burning in outdoor areas to help prevent forest and brush wildfires.

DAM FAILURE CAPABILITY:

As noted in the Hazard Profile, all dams in the county are subject to inspections by the state's Dam Safety Division and the Corps of Engineers. A potential failure at any of the dams in the county would be called into the Department of Emergency Management and relayed to citizens via local radio outlets.

TRANSPORTATION/HAZARDOUS MATERIALS CAPABILITY:

As noted in the Hazard Profile, Caroline County has a Hazardous Materials Response Plan that outlines the county's response to hazardous materials incident. The state Department of the Environment is on call to assist in the cleanup of hazardous materials. The state Department of Transportation would be called upon to assist with a major transportation accident or transportation hazardous materials incident.

VULNERABILITY ASSESSMENT

HAZARD PRIORITY

As noted in the Hazard Identification and Risk Section, the priority for mitigating hazards in Caroline County begins with riverine flooding, extreme heat, thunderstorm and fire/explosion. Other hazards of concern include drought, hurricane and storm surge, and hazardous materials incidents. The natural hazards outlined in the Hazard Profile section for the most part mirror the hazard event summary shown on Figure 33. That summary is based on observations made by Emergency Management personnel over the period from 1950 through mid-2003 and shows that most events relate to thunderstorms, winter weather, high wind, drought and extreme heat. While riverine flooding does not have as high a numerical ranking, the severity of flooding moves that hazard high on the risk and vulnerability assessment.

CRITICAL FACILITIES

Caroline County has chosen to identify and classify Critical Facilities by Fire Districts as shown on Table I. This inventory includes schools, libraries, government buildings, transportation facilities, post offices, fire and rescue stations, utility structures, hospitals and nursing homes, police and corrections, and communication structures. These Critical Facilities are shown on a series of maps running from Figure 34 through 37. Fire District boundaries are shown on Figure 34. Table I also shows the vulnerability for each Critical Facility to a number of hazards including storm surge and hurricane, riverine flooding, wildfire, tornado, hazardous materials and shore erosion.

As noted on Table II, there are more than 270 Critical Facilities identified in Caroline County including 12 schools, 6 fire and rescue stations (note: 2 other stations serve Caroline county from adjacent jurisdictions), 64 utility structures, 60 major bridges and 10 landing facilities.

RESIDENTIAL STRUCTURES

Caroline County has also chosen to identify residential structures at high risk for riverine flooding or hurricane storm surge by Fire District. As shown on Table III, 346 structures have been identified as at risk for Category 4 storm surge. Communities having substantial numbers of at risk residential structures include Federalsburg-278, Preston-78, Greensboro-23, Denton-22 and Choptank and Dover Bridge-78(These communities are in the Preston Fire District). An additional 10 structures are at risk for riverine flooding.

Caroline County has not identified residential structures at risk for other hazards, but certainly recognizes that most structures, including those mobile homes clustered near Henderson, Marydel and Goldsboro in the northeast section of the county and near Preston in the southwest are vulnerable to tornado activity. Additionally, residences along Rts. 404 and 313 are at risk for hazardous materials events as are residences near

the Maryland and Delaware Railroad at Federalsburg. Finally, residences along the forested areas paralleling the Choptank River and Tuckahoe and Marshyhope Creeks are at risk for wildfire. Once again, because of the random nature of these events it would be difficult to quantify the risk for residential structures.

In terms of at-risk populations, the highest concentrations of the elderly population are in the Denton and Federalsburg communities, while the Hispanic population centers on Henderson.

ESTIMATED VALUE

The estimated replacement value of at risk Critical Facilities and residential structures for stream flooding or storm surge hazard is shown on Tables IV and V. By using the FEMA guidelines shown on Table VI for estimating values of various structures, the value of Critical Facilities affected by riverine flooding or storm surge is estimated at nearly $79,600,000. Note that the value of contents is not included in these estimates. Also please be aware that the value of bridges and certain utilities is not based on FEMA guidelines, but is estimated from information provided by construction engineers.

As also noted on Tables IV and V the replacement value of residential structures at-risk for storm surge is estimated at more than $41,000,000. Combined with Critical Facilities this gives for a combined total replacement value of nearly $120,700,000 for riverine flooding and storm surge damage in Caroline County.

HAZARD RATING SYSTEM

While Caroline County ranked a total of 15 different hazards in the Hazard Identification and Risk section of the plan and prepared profiles for each of those hazards, the Planning Committee chose to combine several hazards when addressing them in the Vulnerability Assessment. These combined hazards include hurricane and storm surge; riverine flooding and thunderstorm; and fire/explosion, transportation and hazardous materials. The other hazards addressed include wildfire, tornado, shore erosion (soil movement) and dam failure. While dam failure and shore erosion were not ranked high they are included because they are risks that can be delineated from existing maps. Drought, extreme heat and severe winter weather do not appear on the Table because these hazards are usually widespread when they do occur rather than being specific to a Critical Facility.

Of the hazards addressed in the Vulnerability Assessment, hurricane and storm surge and riverine flooding pose the greatest threat to Critical Facilities and residences in Caroline County. As such, the County has chosen to estimate values for those facilities having a high risk for storm surge and riverine flooding because those hazards can be quantified based on Storm Surge map and Floodplain map information. Of those facilities listed on the Critical Facilities Table, 75 have been identified as having a high risk for storm surge or riverine flooding.

In terms of vulnerability to the other listed hazards, most Critical Facility buildings are rated as having a "low" risk for tornado based on a low frequency of occurrence and the random chance of an occurrence at any given location. Even though wildfire is a risk to those Critical Facilities along the Choptank River and Tuckahoe and Marshyhope Creeks, the risk is rated "low" for wildfire based on a low frequency of occurrence. By the same token those Critical Facilities near major transportation routes are rated "low" for HazMat based on a low frequency of occurrence. Where the vulnerability for a Critical Facility to a particular risk is not rated, the risk was considered either very low or not applicable to that facility by the Planning committee

Critical and Public Facilities
Caroline County
Hazard Data

Fire District	Facility Type	Facility Name	Hurricane/St. Surg	Riverine Flood	Wildfire	Tornado	HazMat	Shore Erosion	Dam Failure	Location	Estimated Value
			Hazard Type								
Denton *	Park	Daniel Crouse Memorial Park	H							Choptank River	
*		Fourth Street Park								Fourth St.	
*		Lions Park								Maryland Ave.	
		Martinak State Park	H		L			L		Choptank River	
*		Coursey Memorial Park								High St. Pk.	
*		Olive Branch Lodge Park								Fifth St.	
		Caroline Co. 4-H Park								Detour Rd.	
		Girl Scout Camp			L					Beauchamp Bridge Rd.	
	Museum	Choptank Maritime Center	H			L				River Landing Rd.	
*		Museum of Rural Life				L				16 N. Second St.	
	School	Co. Career & Tech. Center				L				10855 Central Ave.	
		N. Caroline HS				L				10990 River Rd.	
*		Lockerman MS				L				410 Lockerman Rd.	
		Denton ES				L				303 Sharp Rd.	
		Wesleyan Christian School				L				401 Aldersgate Dr.	
*	Library	Central Library				L				100 Market St.	
*	County Gov't.	Health & Public Services				L				403 S. Seventh St.	
*		Mental Health				L				606 Sunnyside St.	
*		County Public Works				L				520 Wilmuth St.	
*		Caroline Co. Court House				L				109 Market St.	
*		Caroline Co. Emergency Mgt.				L				7 North First St.	
*		Board of Education				L				112 Market St.	
		Caroline Co. Warehouse				L				414 Gay St.	
*	Town Gov't.	Denton Town Hall				L				13 North Third St.	
	State Gov't	District Court Multi-Services				L				207 S. Third St.	
		Job Services				L				300 Market St.	
	Federal Gov't	USDA NRCS				L				640 Legion Rd.	
*	Post Office	Denton P.O.				L				503 Market St.	
*	Fire/Rescue	Denton Co. #300				L				400 S. Fifth St.	

Critical and Public Facilities
Caroline County
Hazard Data

Fire District	Facility Type	Facility Name	Hurricane/St. Surge	Riverine Flood	Wildfire	Tornado	HazMat	Shore Erosion	Dam Failure	Location	Estimated Value
			Hazard Type								
Denton *	Police	Caroline Co. Sheriff & Jail				L				101 Gay St.	
(cont'd) *		Denton Police Dept.				L				601 N. Sixth St.	
	Transportation	SHA				L				Caroline St.	
*	Nursing Home	Shore Nursing and Rehab.				L	L			420 Colonial Dr.	
		Caroline Nursing Home				L				520 Kerr Ave.	
		Caroline Nursing Home				L				309 Academy Ave.	
		Caroline Hospice				L				920 Market St.	
*	Industrial Pk.	Denton Industrial Park				L	L			Engerman Rd.	
*	Utility	Water Tank				L				North Sixth St.	
		Water Tank				L				Martinak State Park	
		Water Tank				L				Engerman Rd.	
		Water Tank				L				Camp Rd.	
		Well (3)								West of Choptank R.	
*		Well (3)								Denton	
		Well (1)								Martinak State Park	
*		WWTP					L			Denton	
*		WW Pump Station (6)								Denton	
		Electric Substation					L			River road	
		Electric Substation					L			Greensboro Rd.	
		Electric Substation					L			Substation Road	
		Electric Substation					L			Clark Rd	
*	Communication	Telephone				L	L			310 Franklin St.	
		800 Mhz Tower				L				508 Caroline Ave.	
	Bridge	Rt. 404								Choptank River	
*		Bus. Rt. 404	H							Choptank River	$ 10,000,000.00
		Rt. 313	H							Chapel Branch	$ 1,500,000.00
		Rt. 328 Tuckahoe Br.	H							Tuckahoe River	$ 5,000,000.00
		Rt. 313 & 404	H							Watts Creek	$ 5,000,000.00

Critical and Public Facilities
Caroline County
Hazard Data

Fire District	Facility Type	Facility Name	Hurricane/St. Surge	Riverine Flood	Wildfire	Tornado	HazMat	Shore Erosion	Dam Failure	Location	Estimated Value
			Hazard Type								
Denton		Detour Rd.		H						Trib. to Choptank	$ 214,246.00
		Double Hill Rd.	H	H						Watts Creek	$ 101,030.00
(cont'd)		Garland Rd.	H	H						Chapel Branch	$ 142,647.00
		Anthony Mill Rd.		H						Watts Run	$ 115,318.00
		Double Hill Rd.		H						Herring Run	$ 123,941.00
		Hobbs Rd.		H						Watts Creek	$ 189,407.00
		Legion Rd.		H						Watts Creek	$ 87,492.00
		Sennett Rd.		H						Herring Run	$ 204,725.00
*	Marina/Dock	Daniel Crouse Boat Ramp	H					L		Choptank River	$ 230,000.00
		Martinak State Park	H					L		Choptank River	$ 230,000.00
		River Landing	H					L		10216 River Landing Rd.	$ 230,000.00
	Dam	Williston Creek							L	Mill Creek	

Critical and Public Facilities
Caroline County
Hazard Data

Fire District	Facility Type	Facility Name	Hurricane/St. Surg	Riverine Flood	Wildfire	Tornado	HazMat	Shore Erosion	Dam Failure	Location	Estimated Value
			Hazard Type								
Federalsburg *	Park	Elliott Chambers Mem. Park	H							Liberty Rd.	
*		Marshyhope Greenway	H		L					Main St.	
		Idylwild WMA	H		L					Marshyhope Creek	
		Smithville Lake Comm. Park								Marshyhope Creek	
*	School	Federalsburg ES				L	L			302 S.University Ave.	
		Col. Richardson MS				L				25320 Richardson Rd.	
		Col. Richardson HS				L				25320 Richardson Rd.	
*	Library	Federalsburg Library	H							123 Morris Ave.	$ 400,000.00
*	Post Office	Federalsburg P.O.	H			L				116 Morris Ave.	$ 150,000.00
*	Town Gov't.	Federalsburg Town Hall	H			L				118 North Main St.	$ 200,000.00
*	Fire/Rescue	Federalsburg Co. #100				L				208 N. University Ave.	
*	Police	Federalsburg Police	H			L				204 South Main St.	$ 190,000.00
	Industrial Park	Federalsburg Industrial Park					L			Industrial Park Rd.	
		Caroline Industrial Park					L			Caroline Dr.	
*	Utilities	M&M Water Tower				L				Caroline Dr.	
		Industrial Park Water Tower				L				Industrial Park Rd.	
		Municipal Water Tank				L				Morris and Vernon Ave.	
*		Wells (5)								Federalsburg	
*		WWTP	H				L			125 Kerney St.	$ 2,397,800.00
*		WW Pump Station (4)	H							Federalsburg	$ 400,000.00
		Electric Substation					L			Reliance road	
*	Communication	Telephone	H			L	L			218 N. Main St.	$ 100,000.00
*		800 Mhz Tower				L				302 N. University Ave.	
*	Bridge	Rt. 313								Marshyhope Creek	
*		Central Ave. (Rt. 306)	H							Marshyhope Creek	$ 5,000,000.00
*		MD & DE Railroad								Marshyhope Creek	
		Rt. 313	H							Miles Branch	$ 1,500,000.00
		Rt. 306	H							Tanyard Branch	$ 1,500,000.00
		Rt. 313	H							Faulkner Branch	$ 1,500,000.00
		Meeting Bridge Rd.		H						Marshyhope Creek	$ 1,500,000.00
		Noble Rd.	H	H						Marshyhope Creek	$ 569,158.00
		Bloomery Rd.		H						Marshyhope Creek	$ 113,818.00

Critical and Public Facilities
Caroline County
Hazard Data

Fire District	Facility Type	Facility Name	Hurricane/St. Surge	Riverine Flood	Wildfire	Tornado	HazMat	Shore Erosion	Dam Failure	Location	Estimated Value
			Hazard Type								
Federalsburg		Long Swamp Rd.		H						Tull Branch	$ 79,605.00
		Old Denton Rd.		H						Faulkner Branch	$ 470,438.00
		Laurel Grove Rd.		H						Faulkner Branch	$ 230,917.00
(cont'd)		Morgan Mill Rd.		H						Sullivan Br.	$ 53,561.00
		Pepper Rd.		H						Faulkner Branch	$ 192,821.00
		Smithville Rd.		H						Sullivan Br.	$ 124,986.00
*	Marina/Dock	Federalsburg Ramp	H					L		Marshyhope Creek	$ 230,000.00
*		Federalsburg Marina	H					L		Marshyhope Creek	$ 230,000.00
*	RR Xing	Rt. 318					L			Federalsburg	
		Guard Rd.					L			Southeast of Federalsburg	
		Wright Rd.					L			Southeast of Federalsburg	
*		Rt. 313					L			Federalsburg	
*		Main St. South					L			Federalsburg	
*		Sunshine Rd.					L			Federalsburg	
*		Sullivan Rd.					L			Federalsburg	
*		Caroline Dr.					L			Federalsburg	
		Rt. 313 By-pass					L			West of Federalsburg	
*	Dams	Lake Chambers							M	Tanyard Branch	
		Smithville Lake							L	Marshyhope Creek	

Critical and Public Facilities
Caroline County
Hazard Data

Fire District	Facility Type	Facility Name	Hurricane/St. Surg	Riverine Flood	Wildfire	Tornado	HazMat	Shore Erosion	Dam Failure	Location	Estimated Value
			Hazard Type								
Hillsboro	Park	Tuckahoe State Park		H	L					Tuckahoe Creek	
*	Post Office	Hillsboro P.O.				L				22043 Main St.	
	Utility	Electric Substation					L			Cemetery Road	
	Bridge	MDOT RR								Tuckahoe Creek	
		Rt. 404								Tuckahoe Creek	
*		Alt. Rt. 404	H							Tuckahoe Creek	$ 5,000,000.00
		Tuckahoe Rd.		H						Trib. to Tuckahoe Cr.	$ 238,054.00
		Tuckahoe Rd.		H						Trib. to Tuckahoe Cr.	$ 83,047.00
*	Marina/Ramp	Hillsboro Ramp	H					L		Tuckahoe Creek	$ 230,000.00
		Stoney Point Landing	H					L		Tuckahoe Creek	$ 230,000.00

Critical and Public Facilities
Caroline County
Hazard Data

Fire District	Facility Type	Facility Name	Hurricane/St. Surge	Riverine Flood	Wildfire	Tornado	HazMat	Shore Erosion	Dam Failure	Location	Estimated Value
Preston	Park	Jonestown Comm. Park								Harmony Rd.	
		Harmony Community Park								Harmony Rd.	
*		James Wright Park								Backlanding Rd.	
*		Preston Lions Club Park								Railroad St.	
		Choptank Wetland Preserve	H		L			L		Choptank River	
	Museum	Linchester Mill	H	H						3390 Linchester Rd.	$ 115,000.00
	School	Preston ES				L				225 Main St.	
*	Library	Preston Library				L				Chambers St.	
*	Post Office	Preston P.O.				L				Main St.	
		Bethlehen P.O.				L				Dover Bridge Rd.	
*	Town	Preston Town Hall				L				Main St.	
*	Fire/Rescue	Preston Co. #200				L				Chambers St.	
*	Police	Preston Police				L				172 Main St.	
*	Industrial Park	Preston Professional Center				L	L			Main St.	
*	Communication	Telephone				L	L			100 Harmony Rd.	
*	Utility	Water Tank				L				Near Back Landing Rd.	
*		Wells (2)								Preston	
		WWTP					L			Near Linchester Rd.	
		WW Pump Station								Near Linchester Rd.	
		Electric Substation					L			Bethlehem Rd.	

Critical and Public Facilities
Caroline County
Hazard Data

Fire District	Facility Type	Facility Name	Hurricane/St. Surge	Riverine Flood	Wildfire	Tornado	HazMat	Shore Erosion	Dam Failure	Location	Estimated Value
Preston	Bridge	Blades Road	H	H						Hunting Creek	$ 822,773.00
(cont'd)		Rt, 331 Dover Bridge	H							Choptank River	$ 10,000,000.00
		Rt, 331 & Rt. 16	H	H						Hunting Creek	$ 5,000,000.00
		Poplar Neck Rd.	H	H						Marsh Creek	$ 273,766.00
		Back Landing Rd.	H	H						Hunting Creek	$ 1,500,000.00
		Frazier Neck Rd.	H	H						Little Creek	$ 164,260.00
		Hog Creek Rd.	H	H						Hog Creek	$ 75,756.00
		Craft Rd.	H	H						Hunting Creek	$ 221,396.00
	Marina/Dock	Ganeys Wharf	H					L		Choptank River	$ 230,000.00
		Choptank Landing	H					L		Choptank River	$ 230,000.00
		Yacht Basin	H					L		Choptank River	$ 500,000.00
*	RR Xing	Maple Rd.					L			Preston	
*		Back Landing Rd.					L			Preston	
	Dam	Fowling Creek Mill Pond							M	Fowling Creek	

Critical and Public Facilities
Caroline County
Hazard Datat

Fire District	Facility Type	Facility Name	Hurricane/St. Surg	Riverine Flood	Wildfire	Tornado	HazMat	Shore Erosion	Dam Failure	Location	Estimated Value
			Hazard Type								
Ridgely *	Park	Railroad Comm. Park								Railroad St	
		Tuckahoe St. Park			L					Tuckahoe Creek	
		Dayspring Park								School St.	
*		Martin Sutton Memorial Park								6th St.	
*	School	Ridgely ES				L				2 Central Ave.	
		Benedictine School				L				14259 Benedictine Lane	
	County	Caroline Humane Society				L				407 W. Belle St.	
		Public Works				L				11930 Holly Road	
*	Town	Town Hall				L				105 W. Belle St.	
*	Post Office	Ridgely P.O.				L				502 Maryland Ave.	
*	Fire/Rescue	Ridgely Co. #400				L				First Street	
*	Police	Ridgely Police				L				2 Central Ave.	
*	Transportation	Ridgely Air Park				L				Racetrack Rd.	
*	Utility	Water Tank				L				North First St.	
*		Wells (3)								Ridgely	
*		WWTP					L			23236 Belle Rd.	
*		WW Pump Station (3)								Ridgely	
	Communication	Telephone					L			11589 Ridgely Rd.	
	Bridge	Mason Bridge Rd.		H						Mason Branch	$ 289,232.00
		Eveland Rd.		H						Piney Branch	$ 93,972.00
		Holly Rd.		H						Trib. to Choptank	$ 183,006.00
		Log Cabin Rd.		H						Trib to Tuckahoe Creek	$ 215,585.00
		River Rd.		H						Trib to Choptank	$ 118,290.00
		Crouse Mill Rd. Br.		H						Tuckahoe Creek	$ 1,500,000.00
	Dam	Tuckahoe St. Park							L	Tuckahoe Creek	

Critical and Public Facilities
Caroline County
Hazard Data

Fire District	Facility Type	Facility Name	Hurricane/St. Surg	Riverine Flood	Wildfire	Tornado	HazMat	Shore Erosion	Dam Failure	Location	Estmated Value
			Hazard Type								
Greensboro *	Park	Greensboro Carnival Grounds		H	L					Sunset Ave.	
*		Senior League Ball Park								School St.	
*		Ober Park								Bernard Ave.	
		Lions Club Comm. Park		H						Ridgely Rd.	
		Greensboro Christian Park		H						Choptank R.	
		Pelot Bird Sanctuary		H	L					Gravelly Branch	
	School	Greensboro ES				L				625 N. Main St.	
	Library	North County Branch				L				101 Cedar Lane	
*	County	Hist. Society of Caroline Co.				L				Sunset Ave.	
*	Town	Greensboro Town Hall				L				104 Sunset Ave.	
*	Post Office	Greensboro P.O.				L				202 W. Sunset Ave.	
*	Fire/Rescue	Fire Co. #600				L				118 N. Main St.	
*	Police	Greensboro Police				L				118 N. Main St.	
*	Utility	Water Tank				L				Academy St.	
*		Wells (4)								Greensboro	
*		WWTP		H			L			Near Elmore Ct.	$ 500,000.00
*		WW Pump Station (1)		H						Near Sunset Ave.	$ 100,000.00
*		WW Pump Station (2)								Greensboro	
*	Communication	Telephone								104 W. Sunset Ave.	
*	Bridge	Rt. 313					L			Choptank	$ 5,000,000.00
		Gregg Rd.		H						Gary Mill Pond Br.	$ 76,887.00
		Sunset Ave.		H						Forge Branch	$ 136,143.00
		Knifebox Rd.		H						Gary Mill Pond Br.	$ 254,725.00
		Holly Rd.		H						Forge Branch	$ 209,787.00
		Drapers Mill Rd.		H						Gravely Branch	$ 368,985.00
		Boyce Mill Rd.		H						Gravely Branch	$ 137,251.00

Critical and Public Facilities
Caroline County
Hazard Data

Fire District	Facility Type	Facility Name	Hurricane/St. Surge	Riverine Flood	Wildfire	Tornado	HazMat	Shore Erosion	Dam Failure	Location	Estimated Value
			Hazard Type								
Marydel * T	Park	Templeville Comm. Park								Crown Stone & Barclay Rd.	
		Henderson Comm. Park								Bee Tree Rd.	
* MD	Post Office	Marydel P.O.				L				Halltown Rd.	
	Bridge	River Bridge Rd.		H						Choptank R.	$ 235,081.00
		Stafford Rd.		H						Beaverdam Ditch	$ 125,298.00
Goldsboro * G	Park	Goldsboro Comm. Park				L				Oldline Rd. & Oldtown Rd.	
* G	Town Hall	Goldsboro Townhall				L	L			Oldtown Rd.	
	County Gov't	Public Works				L				Melville Rd.	
	Community	Goldsboro Comm. Hall				L				Greensboro Rd.	
* G	Post Office	Goldsboro P.O.				L	L			Oldtown Rd.	
* H		Henderson P.O.				L	L			321 Bee Tree Rd.	
* G	Fire & Rescue	Goldsboro Co. #700				L				Greensboro Rd.	
* G	Police	Goldsboro Police								Oldtown Rd.	
*G	Communication	800 Mhz Tower				L				700 Old Line Rd.	
	Bridge	Rt. 313-Goldsboro Rd.		H						Mason Branch	$ 1,500,000.00
		Rt. 304-Bridgetown Rd.		H						Mason Branch	$ 1,500,000.00
		Rt. 287-Sandtown Rd.		H						Choptank R.	$ 1,500,000.00
		Taylor Rd.		H						Long Marsh Ditch	$ 130,638.00
* H	Utility	Water Tank				L				Nr. Bee Tree Rd.	
* H		Well								Nr. Bee Tree Rd.	
		Water Tank				L				Caroline Acres	
		Well								Caroline Acres	
	Dam	Lake Bonnie							L	Oldtown Br.	

G: Golsboro MD: Marydel H: Henderson

Critical and Public Facilities by Fire District
Caroline County

Type of Facility	Federalsburg	Preston	Denton	Hillsboro	Ridgely	Greensboro	Goldsboro	Marydel	Total
Park	4	5	8	1	4	6	1	2	31
Museum		1	2						3
School	3	1	5		2	1			12
College									
Library	1	1	1			1			4
County Govt.			7		2	1	1		11
State Govt.									
Federal Govt.			1						1
Town Govt.	1	1	1		1	1	1		6
Community			1				1		2
Hosp./N.Home			4						4
Post Office	1	2	1	1	1	1	2	1	10
Fire/Rescue	1	1	1		1	1	1		6
Transportation			1		1				2
Police/Corr	1	1	2		1	1	1		7
Military			1						1
Water/Sewer	13	5	18		8	9	4		57
Garbage									
Elect. Substat.	1	1	4	1					7
Communication	2	1	2		1	1	1		8
Ind. Park	2	1	1						4
Marina/Dock	2	3	3	2					10
Maj. Bridge	15	8	13	5	6	7	4	2	60
RR Xing	9	2							11
Dam	2	1	1		1		1		6
Haz MSDS	6	2	1		1	2			12
Total	64	37	79	10	30	32	18	5	275

Table II

Residential Communities at Risk for Storm Surge and Riverine Flooding by Fire District in Caroline County

	Federalsburg	Preston	Denton	Hillsboro	Ridgely	Greensboro	Goldsboro	Marydel	Total
Category 4 Storm Surge	217	78	22	6		23			346
Riverine Flood					1		5	4	10
Total									356

Source: FEMA FIRM maps for Caroline County
Maryland Hazard Analysis Storm Surge Map

Table III

Damage Estimates by Fire District
Caroline County
Storm Surge and Riverine Flooding

	Federalsburg	Preston	Denton	Hillsboro	Ridgely	Greensboro	Goldsboro	Marydel	Total
Museum		115,000							115,000
School									
Library	400,000								400,000
Town Hall	200,000								200,000
Hospital									
Post Office	150,000								150,000
Fire/Rescue									
Transportation									
Police	190,000								190,000
Military									
Water/Sewer	2,797,800					600,000			3,397,800
Communication	100,000								100,000
Elect. Substat.									
Major Bridge	12,835,364	18,057,951	22,678,806	5,321,101	2,400,085	6,183,778	4,630,638	360,379	72,468,102
Marina	460,000	960,000	690,000	460,000					2,570,000
Total Critical	17,133,164	19,132,951	23,368,806	5,781,101	2,400,085	6,783,778	4,630,638	360,379	79,590,902
Residential	25,063,500	8,970,000	2,541,000	693,000	115,500	2,656,500	577,500	462,000	41,079,000
Grand total	42,196,664	28,102,951	25,909,806	6,474,101	2,515,585	9440,278	5,208,138	822,379	120,669,902

Note: See Table V for Estimate Values
Residential value estimated from Table III and Table V
Critical Facilities values from Hazard Data Table

Table IV

Damage Estimates for Caroline County
Storm Surge and Riverine Flooding

Type of Facility	Number of Structures	Value in Dollars
Museum	1	115,000
School		
Library	1	400,000
Town Hall	1	200,000
Hospital		
Post Office	1	150,000
Fire/Rescue		
Transportation		
Police	1	190,000
Military		
Water/Sewer	7	3,397,800
Communication	1	100,000
Major Bridge	52	72,468,102
Marina	10	2,570,000
Total Critical	75	79,590,902
Residential	356	41,079,000
Total Structures	431	120,669,902

Note: Estimates for buildings based on FEMA Criteria: Residential - $77/sq. ft. @ 1500 sq ft. avg
School - $91/sq. ft.
Fire/Rescue - $130/sq. ft.
General - $87/sq. ft.

Estimates for utilities: WWTP- $.5M Pump Station-$.1M Comm-$.25M Tower
WTP- $.1M Water Tank- $.25M $.1M Telephone

Estimates for bridges: County - $1.5M or DPW value where available Landings: $.23M
State -$10.0, $5.0, or $1.5M depending on size $.50M for Preston Yacht Basin
Does not include estimate for Rt. 404 bridge over the Choptank River

Table V

FEMA REPLACEMENT VALUES

BUILDING REPLACEMENT VALUE/SQUARE FOOT	
Occupancy Class	**Total Value per Square Foot**
Single Family Dwelling	$77
Mobile Home	52
Multi-Family Dwelling	98
Dormitory	98
Nursing home	89
Retail Trade	67
Wholesale Trade	53
Repair Services	92
Prof/Technical Services	87
Banks	151
Hospitals	145
Medical Office/Clinic	112
Entertainment	131
Theatres	98
Industrial	69
Construction	69
Agriculture	26
Church/Non-Profit	113
General Government	88
Emergency Response	130
Schools	91
College	115

CONTENTS VALUE	
Occupancy Class	**Contents as Percent of Building Value**
Residential(all types)	50%
Commercial	100%
Hospital/Clinic/Medical Office	150%
Industrial	150%
Construction	100%
Agriculture	100%
Church/Non-Profit	100%
General Government	100%
Emergency Response	150%
Schools	100%
Colleges	150%

Source: FEMA State and Local Mitigation Planning Guide Table VI

MITIGATION STRATEGIES

INTRODUCTION

Following the completion of the vulnerability analysis, the Caroline County Hazard Mitigation Planning Committee developed a mitigation strategy that includes a set of goals and objectives which serves as the basis for implementing a number of mitigation action items for mitigating the hazards described in Section III of the plan. The eight goals and accompanying objectives are listed in this section.

Upon completion of the goals and objectives, the Planning Committee developed six broad categories of mitigation action items. These actions include Prevention, Property Protection, Public Education and Awareness, Natural Resource Protection, Emergency Services and Structural Projects. The Planning Committee has identified and prioritized nearly forty separate mitigation action items that address one or more of the plan goals.

The mitigation action items relate back to the high risk hazards described and prioritized in Section III of the plan. Of these items, ten relate to flooding, three relate to hazardous materials, six relate to tornado, hurricane or high winds, and three relate to fire suppression. Finally, a number of the action items pertaining to Public Education and Awareness, and Emergency Services, relate to all of the identified hazards.

Goals as identified in this plan are broad-based and long-term in nature. The following goals identify what the community expects to accomplish through mitigation actions during the next five years. Objectives as identified in this plan are more specific and narrow in scope than goals. They expand upon the goals and provide more detail on how the County can accomplish them.

These goals, objectives, and mitigation action items apply to municipal participants as well as the unincorporated part of the county.

GOAL 1 **Maintain and enhance Caroline County's Department of Emergency Management's capacity to continuously make Caroline County less vulnerable to hazards.**

Objective 1.1 Institutionalize hazard mitigation.
Objective 1.2 Improve organizational efficiency.
Objective 1.3 Maximize utilization of best technology.

GOAL 2 **Build and support municipal capacity and commitment to become continuously less vulnerable to hazards.**

Objective 2.1 Increase awareness and knowledge of hazard mitigation principles and practice among local and municipal public officials.
Objective 2.2 Provide assistance to municipal officials and help municipalities obtain funding for mitigation planning and project activities.
Objective 2.3 Prepare technical reports for critical facilities as necessary

GOAL 3 **Improve coordination and communication with other relevant organizations.**

Objective 3.1 Establish and maintain lasting partnerships.
Objective 3.2 Streamline policies to eliminate conflicts and duplication of effort.
Objective 3.3 Incorporate hazard mitigation into activities of other organizations.

GOAL 4 **Increase public understanding, support, and demand for hazard mitigation.**

Objective 4.1 Identify hazard specific issues and needs.
Objective 4.2 Heighten public awareness of natural hazards.
Objective 4.3 Publicize and encourage the adoption of appropriate hazard mitigation actions.
Objective 4.4 Increase the number of business that have developed a business risk reduction plan.
Objective 4.5 Increase the proportion of businesses and residences that have flood insurance.

GOAL 5 **Protect existing and future properties (residential, commercial, public, and critical facilities).**

Objective 5.1 Utilize the most effective approaches to protect buildings from flooding, including acquisition and elevation.
Objective 5.2 Enact and enforce regulatory measures to ensure that new development will not increase hazard threats from riverine flooding, storm surge or the threat of wildfire at the urban/forest interface.
Objective 5.3 Review and update Building Codes to ensure that manufactured housing, including mobile homes, are constructed and installed in a manner to minimize wind and storm surge damage.
Objective 5.4 Reduce the number of houses in the floodplain that are subject to losses from flooding.
Objective 5.5 Increase the number of critical facilities that have carried out mitigation measures to ensure their functionality.

GOAL 6 **Ensure that public funds are used in the most efficient manner.**

Objective 6.1 Prioritize new mitigation projects, starting with sites facing the greatest threat to life, health, and property.
Objective 6.2 Use public funding to protect public services and critical facilities.
Objective 6.3 Use public funding on private property where benefits exceed costs.
Objective 6.4 Maximize the use of outside funding sources.
Objective 6.5 Encourage property-owner self-protection measures.

GOAL 7 **Promote sustainable development to improve the quality of life.**

Objective 7.1 Establish open space parks and recreational areas in flood hazard areas.
Objective 7.2 Provide for the conservation and preservation of natural resources.
Objective 7.3 Limit additional housing (especially elderly and high density) in areas of high hazard risk.

GOAL 8 **Prevent destruction of forests and structures in the Urban Wildland Interface.**

Objective 8.1 Identify specific high hazard areas in the Urban Wildland Interface and notify residents of means to protect their property from wildfire damage.

Objective 8.2 Develop evacuation procedures to enable residents near forested areas to evacuate safely.

MITIGATION ACTIONS

Mitigation Actions address the goals and objectives developed by the Hazard Mitigation Planning Committee and the Local Emergency Planning Committee. These actions form the core of the Caroline County Multi-Hazard Mitigation Plan. The Mitigation Actions are grouped into the following six broad categories:

1. **Prevention.** Government administrative or regulatory actions or processes that influence the way land and buildings are developed and built. These actions also include public activities to reduce hazard losses. Examples include planning and zoning, building codes, capital improvement programs, open space preservation, and storm water management regulations.
2. **Property Protection**. Actions that involve the modification of existing Critical Facilities and other buildings or structures to protect them from hazards. Examples include acquisition, elevation, relocation, structural retrofits, and storm shutters.
3. **Public Education and Awareness**. Actions to inform and educate citizens, elected officials, and property owners about the hazards and potential ways to mitigate them. Such actions include outreach projects, real estate disclosure, hazard information centers, and school-age and adult education programs.
4. **Natural Resource Protection**. Actions that, in addition to minimizing hazard losses, also preserve or restore the functions of natural systems. These actions include sediment and erosion control, stream corridor restoration, watershed management, forest and vegetation management, and wetland restoration preservation.
5. **Emergency Services**. Actions that protect people and property during and immediately after a disaster or hazard event. Services include warning systems and emergency response services.
6. **Structural Projects**. Actions that involve the construction of structures to reduce the impact of a hazard. Such structures include dams, levees, floodwalls, seawalls, retaining walls, and safe rooms.

MITIGATION ACTION RATINGS

The following table lists the Mitigation Action Items set forth by the Planning Committee and denotes which Goals and Objectives are met by each item and gives the Time Frame for completion and the Rating established by the Planning Committee. Planning Committee members rated each action item on a scale of 1-5, with 5 being the highest. The Mitigation Actions Table shows a composite of the committee's rankings.

Overall, six action items were rated as high. An additional fifteen action items were rated medium. The final twelve action items were rated as low.

Of the six high rated actions, one is Prevention related, one is related to Public Education and four are related to Emergency Services. Of the fifteen medium actions, six are Prevention oriented, two are Property Protection related, three are Education oriented, and four are related to Emergency Services.

POTENTIAL MITIGATION PROJECTS

The last page of the Table shows a list of potential Mitigation Projects that address the six highest rated Mitigation Actions. These projects include increasing training opportunities for emergency responders, improving water systems for fire suppression, providing dry hydrants for fire suppression, inspecting power generators at shelters and specified facilities, and reviewing and updating the Caroline County Emergency Operations Plan. Most of these projects can be accomplished at minimum expense to the County but do require staff time. Other potential projects can be taken directly from the medium rated Mitigation Actions as the County's needs change over time.

MITIGATION ACTIONS

ACTION	GOALS	OBJECTIVES	TIMEFRAME	RATING
Prevention				
Expand the mission of the Local Emergency Planning Committee to include All Hazards disaster planning.	1 3	1.1; 1.2 3.1; 3.2	Short-term	Low
Work with FEMA, MEMA, and MDE to develop digital FIRMS and identify areas for revision of FIRMS.	1 4 5 6	1.1; 1.2; 1.3 4.1; 4.3 5.1; 5.2 6.5	Long-term	Medium
Conduct a Hazardous Materials Survey to identify all hazardous materials that are either stored or traveling through the county.	4	4.1; 4.2	Long-tern	Low
Using Hazardous Materials Survey results, develop a plan to mitigate any identified risks.	4	4.1; 4.2	Long-term	Medium
Allocate county resources and assistance to mitigation projects when possible. Include mitigation projects in Capital Improvement Plan.	2 6	2.2 6.1; 6.2; 6.3; 6.4	Long-term	Medium
Review existing network of Datum Markers and re-survey, replace, and add new Datum Markers in areas identified as high risk for flooding.	2 5 6	2.3 5.2 6.2; 6.3; 6.4	Long-term	Medium
Work with DNR, Conectiv, Choptank Coop. and other utilities to promote an ongoing tree-trimming program.	1 3 6	1.1 3.1; 3.3 6.4	Ongoing	Medium
Initiate a program to install, inspect and ensure operation of power generators at pre-identified critical facilities.	1 3 4	1.1 3.3 4.3	Ongoing	**High**
Work with DNR to identify areas of high risk for wildfire in the Urban Wildland Interface, and monitor and warn residents of Wildfires dangers.	3 8	3.1; 3.3 8.1; 8.2	Long-term	Low

ACTION	GOALS	OBJECTIVES	TIMEFRAME	RATING
Work with Public Utility Companies to identify and prioritize facilities at risk in high hazard areas.	2 3 4 5	2.1 3.1 4.1 5.4	Long-term	Medium
Property Protection				
Elevate or acquire residential properties affected by flooding in targeted areas including the Storm Surge area in Federalsburg.	1 2 5 6	1.1; 1.3 2.1; 2.2; 2.3 5.1; 5.3 6.2; 6.3; 6.4; 6.5	Long-term	Low
For the critical facilities listed as having a high vulnerability in the risk assessment and identified by the planning committee as a high priority, a technical report should be completed to provide information on Mitigation alternatives such as the installation of a berm or related measures. Detailed cost/benefit analyses need to be completed for each structural project.	2 5 6	2.3 5.4 6.2; 6.4	Long-term	Medium
Identify residential structures that would be candidates for retrofit projects to reduce flood damage.	2 5	2.2 5.1; 5.3; 5.4 6.2; 6.3; 6.4	Long-term	Medium
Public Education and Awareness				
Distribute annual mitigation informational brochure or newsletter to residents and business owners. Distribute with local water/sewer bills or tax or other utility bills	4 6	4.2; 4.4 6.5	Ongoing	Low
Work with the County Visitors/Tourism Bureau, MD DNR to alert tourists to potential hazard areas and what to do in the event that a man-made or natural hazard event occurs. This would include brochures to be left at hotels, visitor centers, and attractions to inform visitors about evacuation routes, and sheltering info.	4 8	4.2 8.1; 8.2	Short-term	Medium

ACTION	GOALS	OBJECTIVES	TIMEFRAME	RATING
Work with the County Health Department to provide information to citizens on infectious diseases.	4	4.1; 4.2; 4.3	Ongoing	Medium
Incorporate information about disaster preparedness and mitigation activities and opportunities on the County's website.	4 6	4.1; 4.2 6.5	Ongoing	**High**
Work with representatives from the National Flood Insurance Program to hold courses in the County for real estate and flood insurance agents.	3 4	3.1; 3.3 4.1; 4.2; 4.4; 4.5	Short-term	Low
Work with FEMA & MEMA to hold Business Continuity Training Workshops.	3 4	3.1 4.1; 4.2; 4.3; 4.4; 4.5	Short-term	Medium
Partner with the National Weather Service to provide training to people throughout the county on Storm Spotting.	3 4	3.1 4.1; 4.2	Short-term	Low
Develop a one-page handout on flood insurance and distribute to local insurance agencies.	4	4.1; 4.2	Long-term	Low
Develop and administer outreach programs to identified business organizations that should prepare for flood events.	3 4	3.1 4.1; 4.2; 4.3; 4.4	Short-term	Low
Conduct natural hazards awareness programs in schools and community centers.	3 4	3.1; 3.3 4.1; 4.2; 4.3	Short-term	Low
Natural Resource Protection				
Pursue vegetation and restoration practices that assist in enhancing and restoring the natural and beneficial functions of watersheds.	1 7	1.3 7.1; 7.2; 7.3	Short-term	Low
Promote community & neighborhood planning for wildfire protection and for access for emergency vehicles.	8	8.1; 8.2	Short-term	Low
Emergency Services				
Coordinate with the American Red Cross to upgrade all shelter resources.	1 3	1.2 3.1	Short-term	Medium
Teach CERT (Community Emergency Response Training) classes to interested citizens to assist first responders at specified emergencies throughout the county.	1 3 4	1.2 3.1; 3.2 4.1	Ongoing	**High**

ACTION	GOALS	OBJECTIVES	TIMEFRAME	RATING
Hold disaster exercises in various areas of the county. Types of exercise: flood, high wind, winter storm. Hazardous Materials spills, Weapons of Mass Destruction, and Bio-Terrorism exercises.	1 2 3 4	1.1; 1.2; 1.3 2.1 3.1; 3.2 4.1	Ongoing	Medium
Develop list of all training opportunities and distribute to all local emergency responders.	1 3	1.1; 1.2 3.1; 3.3	Ongoing	**High**
Review and update all annexes in the County Emergency Operations Plan. Include participation from all municipalities.	1 2 3	1.1; 1.2 2.1 3.2	Long-term	**High**
Utilize and where necessary update hazard warning systems.	1 6 8	1.2; 1.3 6.4 8.1	Long-term	Medium
Create HazMat Team for Caroline County	1 6	1.1; 1.2; 1.3 6.4	Long-term	Medium
Improve communications with Dover Air Force Base concerning flight paths over Caroline County.	3	3.1; 3.2; 3.3	Short-term	**High**
Structural Projects				
Work with Municipalities to upgrade undersized water lines for fire suppression.	1 2 3 6	1.2; 1.3 2.1; 2.2 3.1 6.1; 6.2; 6.4	Long-term	**High**
Install Dry Hydrants for improved water supply for fire suppression at strategic locations.	1 2 3 6	1.2; 1.3 2.1; 2.2 3.1 6.1; 6.2; 6.4	Long-term	**High**

CAROLINE COUNTY POTENTIAL PROJECTS LISTING

The following listing was derived from the Caroline County Action Items and the accompanying prioritization ranking assigned by the Hazard Mitigation Planning Committee. Those Action Items that were ranked as **High** are addressed by these projects.

Project Description	Potential Partners	Estimated Cost
Initiate systematic training program for local emergency responders.	Caroline County Emergency Management Emergency Response Personnel	Staff Time Training Materials
Initiate CERT Training classes.	Caroline County Emergency Mgt. Fire & Rescue Departments	Training Equipment Average Cost: $ 150.00 per student
Initiate standard communication procedures with Dover Air Force Base.	Caroline County Emergency Mgt. Maryland Emergency Management Agency LEPC Members	No Direct Cost
Update County Emergency Operation Plan and all Annexes.	Caroline County Emergency Mgt. Appropriate County Agencies Municipal Representatives Maryland Emergency Management Agency	No Direct Cost: In-House
Install, inspect and ensure operation of power generators at Emergency Shelters, Medical Offices, Nursing Homes, water and sewer facilities and media outlets. This includes municipalities having such facilities as listed on the Vulnerability Table in Section 6.	Caroline County Emergency Mgt. Caroline County Public Works Caroline County Municipalities Caroline County Social Services Caroline County Board of Education American Red Cross	No Direct Cost: In-House Or Could have Contracting Cost
Upgrade community water systems for fire suppression, specifically the Towns of Denton, Federalsburg, Greensboro, Ridgely and Preston.	Caroline County Emergency Mgt. Caroline County Public Works Caroline County Municipalities Caroline County Planning & Zoning Maryland Department of the Environment	To be determined.

Install a network of dry hydrants for fire suppression in both urban and rural communities. This includes all municipalities.	Caroline County Emergency Mgt. Caroline Soil Conservation District Caroline County Municipalities Caroline County Public Works Maryland Emergency Management Agency MD Dept. of the Environment	Average Cost per Hydrant $ 1,500
Add disaster preparedness and information regarding mitigation activities and opportunities to the County's website.	Caroline County Emergency Mgt. Caroline County Office of Technology LEPC Members Private Sector Partners Maryland Emergency Management Agency	No Direct Cost
Prepare and distribute brochure on burning since permits are no longer issued	Caroline County Emergency Management Caroline County Health Department	No Direct Cost

FEDERAL MITIGATION PROGRAMS

INTRODUCTION

The federal government offers a number of mitigation programs, activities and initiatives for state and local governments to use in carrying out Hazard Mitigation Actions. These programs are administered by a number of federal agencies including the Federal Emergency Management Agency (now part of the Homeland Security Department), the U. S. Geological Survey, the National Science Foundation, the Natural Resources Conservation Service, the Department of Defense, the Department of Commerce, the Environmental Protection Agency, the National Oceanic and Atmospheric Administration, the Department of Housing and Urban Development, and other subsidiary offices.

Mitigation programs include applied research, hazard identification and mapping, technical and planning assistance, project support and financing and loan guarantees. A listing of federal programs is shown on the following pages. This listing includes a brief synopsis of each program and contact information.

FUNDING CRITERIA

Most federal programs require local matching funds. For example, FEMA's Hazard Mitigation Grant Program requires a local contribution of 25% to be in-kind services or matching funds. However, the Maryland Department of the Environment Comprehensive Floodplain Management Grant Program may provide one half of the local match for FEMA flood mitigation projects which lowers the local share to 12.5%. In some cases this local share can be contributed as in-kind services through existing employees time attributed to the project or through the use of office space or similar service provision. The local share can also be contributed by local organizations or property owners, as is sometimes the case with acquisition or elevation projects. In short, there are a number of ways in which projects can be assembled through innovative funding techniques. The programs listed are a good starting point for any local agency seeking to carry out Hazard Mitigation projects.

Federal Mitigation Programs

Hazard ID & Mapping		
Available Program	**Type of Assistance**	**Agency**
National Flood Insurance Program Flood Mapping	Technical and Financial	FEMA
National Digital Orthophoto Program	Technical	DOI-USGS
Streamgaging and Flood Monitoring	Technical	DOI-USGS
Soil Surveys	Technical	USDA-NRCS
National Earthquake Hazard Reduction Program	Technical	DOI-USGS
Technical & Planning Assistance		
Disaster Mitigation Planning and Technical Assistance	Technical	DOC-EDA
Watershed Surveys and Planning	Technical	USDA-NRCS
National Flood Insurance Program	Financial	FEMA
National Dam Safety	Technical	FEMA
Floodplain Management Services	Technical & Planning	DOD-USACE
Watershed Protection and Flood Prevention Program	Technical & Financial	USDA-NRCS
Rivers, Trails, and Conservation Assistance Program	Technical	DOI-NPS
Project Support		
Beneficial Uses of Dredged Materials	Financial	DOD-USACE
Clean Water Act Section 319 Grants	Financial	EPA
Coastal Zone Management Program	Financial	DOC-NOAA
Community Development Block Grant	Financial	HUD
Rural Development Assistance-Utilities	Financial	USDA-RUS

Available Program	Type of Assistance	Agency
Flood Mitigation Assistance	Financial	FEMA
Hazard Mitigation Grant Program	Financial	FEMA
Public Assistance Program	Financial	FEMA
National Flood Insurance Program	Financial	FEMA
Pre-Disaster Mitigation Grant Program	Financial	FEMA
Non-Structural Alternatives to Structural Rehabilitation of Damaged Flood Control	Financial	DOD-USACE
Land Protection	Financial	USDA-NRCS
Land Acquisition	Financial	DOI-FWS

PLAN MAINTENANCE AND IMPLEMENTATION

PLAN ADOPTION

The Disaster Mitigation Act of 2000 requires that local Hazard Mitigation Plans and any updates be formally adopted by the County Commissioners following review by the Maryland Emergency Management Agency and FEMA. The Plan and any updates will be subject to a public hearing prior to adoption by the Commissioners.

PLAN UPDATE AND CONTINUED PUBLIC INVOLVEMENT

The Disaster Mitigation Act of 2000 requires local Hazard Mitigation Plans to be monitored, evaluated, and updated during a five-year cycle. The County's Planning Committee, which was instrumental in developing the Hazard Mitigation Plan, will continue to meet at least once annually during the five-year cycle to monitor and evaluate mitigation projects and to keep the plan current. The Planning Committee will submit annual status reports to the County Commission to update that group on the progress of various mitigation activities. Copies of these reports will be made available to the general public.

The annual status report will detail mitigation activities undertaken over the course of the year and will highlight completed activities. The report will also address the following points:

- Evaluate the goals and objectives to ensure they address current and expected conditions.
- Determine if the nature or magnitude of risk has changed.
- Evaluate whether current resources are adequate for implementing the plan.
- Document any technical, legal or coordination issues.
- Document agency and partner participation along with public involvement.

Copies of the annual status report will be made available to Planning Committee members, local governments, participating agencies and partners and citizens.

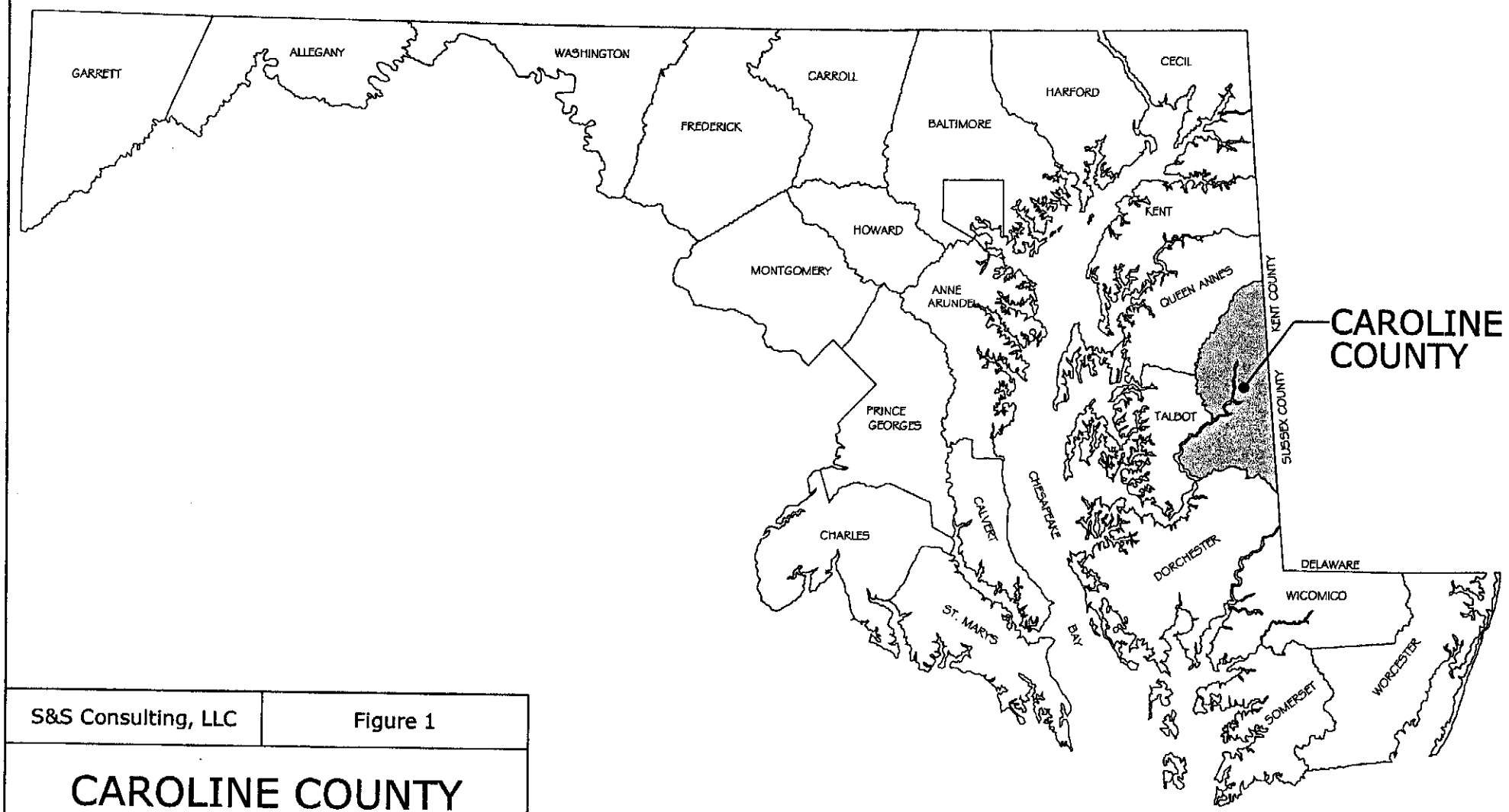
The Hazard Mitigation Plan is to be updated and readopted at the end of each five-year cycle. In the event of a significant disaster or any substantial changes in land use or regulations that impact mitigation efforts, more frequent updates may be required. The Planning Committee and the Department of Emergency Management will be responsible for overseeing the update to the Hazard Mitigation Plan. The process used to update the plan would follow the procedure used to prepare the original plan. This would include participation by the Planning Committee and would also include municipal and citizen involvement.

IMPLEMENTATION

The Disaster Mitigation Act of 2000 also requires that the County implement the Plan through existing programs. This can be accomplished through inclusion of mitigation

measures in the Comprehensive Plan, the Land Use and Building Codes, the Floodplain Ordinance and through Federal grant programs which are identified in the previous section. As these documents are updated, reference to the mitigation measures included in the Hazard Mitigation Plan can be amended into various plans and regulations.

FIGURES



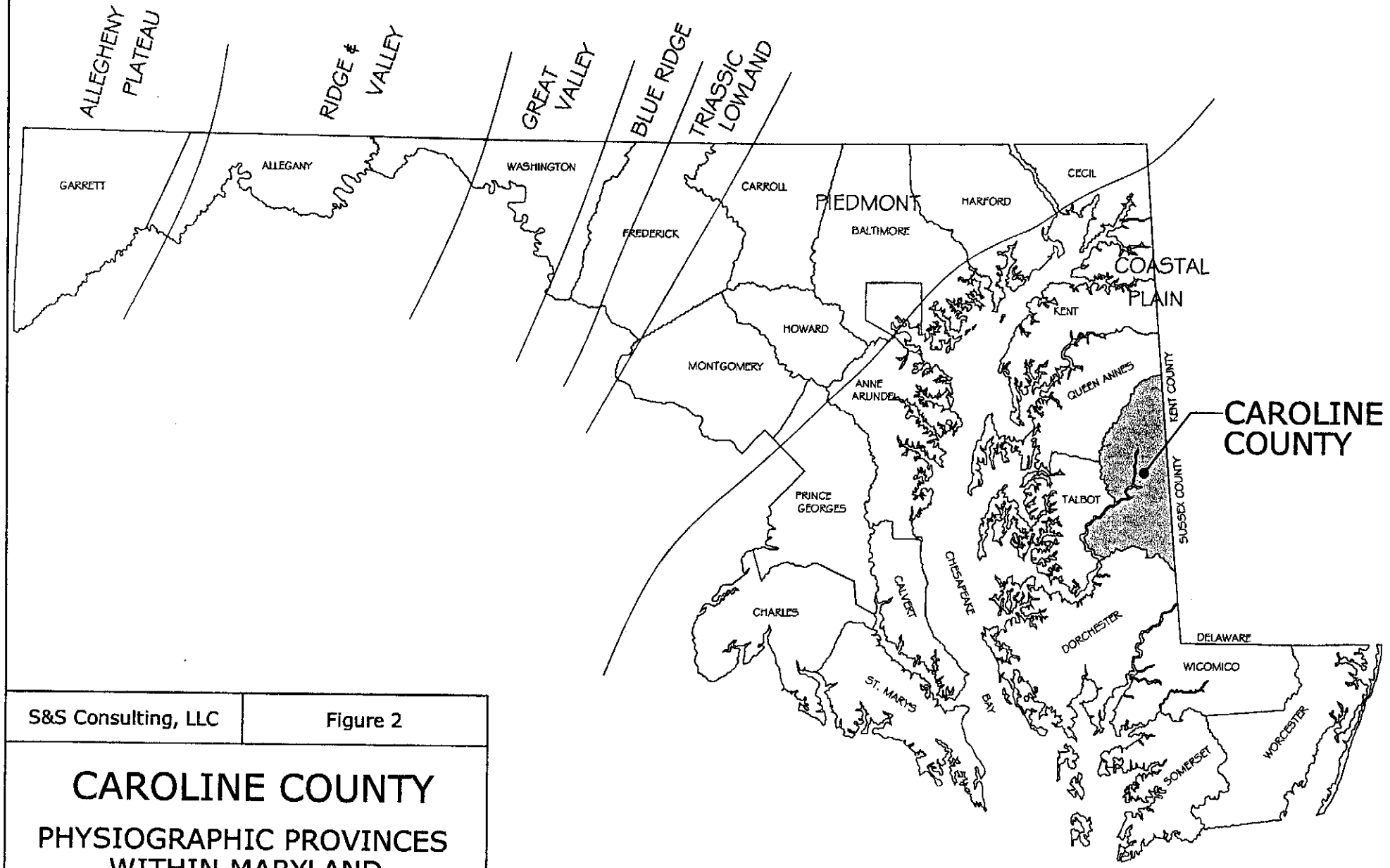
S&S Consulting, LLC	Figure 1

CAROLINE COUNTY

LOCATION MAP WITHIN MARYLAND

Souce: Maryland Geological Survey

Date: Sept. 20, 2004	Scale: N.T.S.



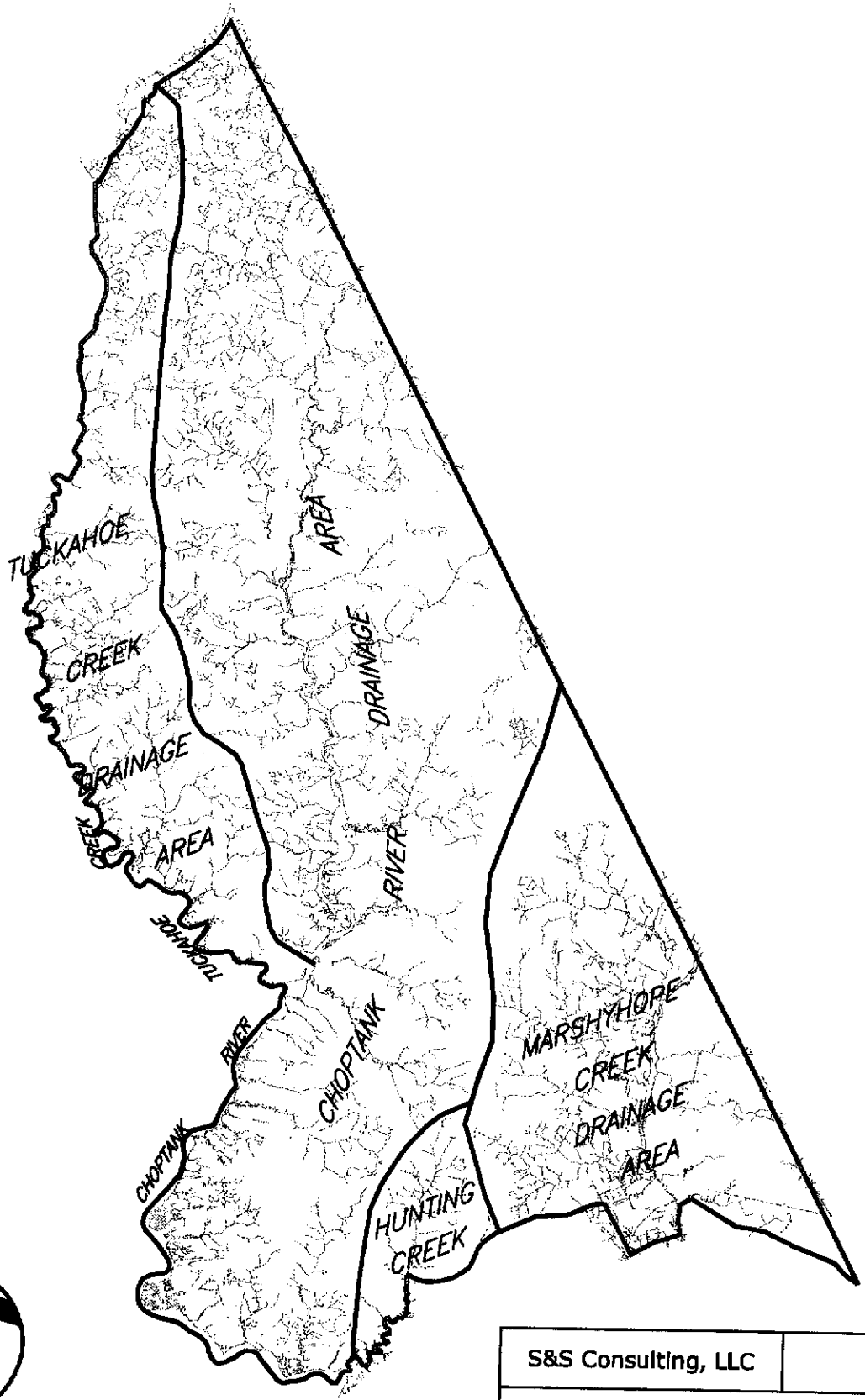
S&S Consulting, LLC	Figure 2

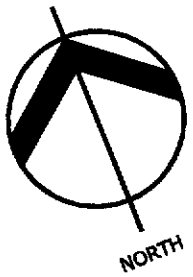
CAROLINE COUNTY

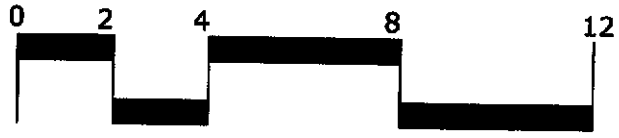
PHYSIOGRAPHIC PROVINCES WITHIN MARYLAND

Source: Powell-Physiographic Provinces of the U.S.

Date: Sept. 20, 2004	Scale: N.T.S.







SCALE: 1"=4 mi.

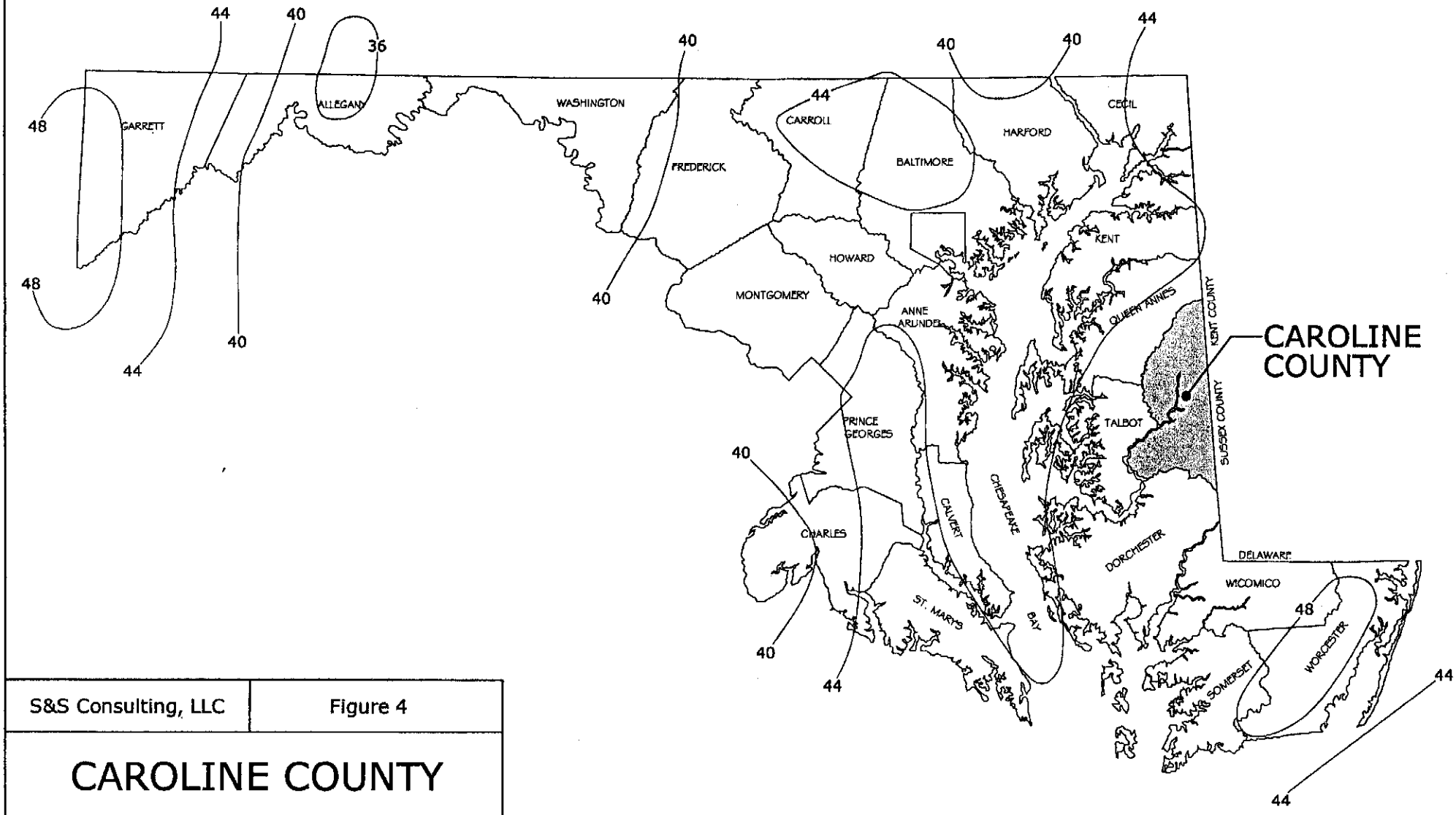
S&S Consulting, LLC	Figure 3

CAROLINE COUNTY

MAJOR STREAMS & WATERSHED BOUNDARIES

Source: Caroline Co. Planning and Zoning

Date: Sept. 20, 2004	Scale: 1"=4 mi.



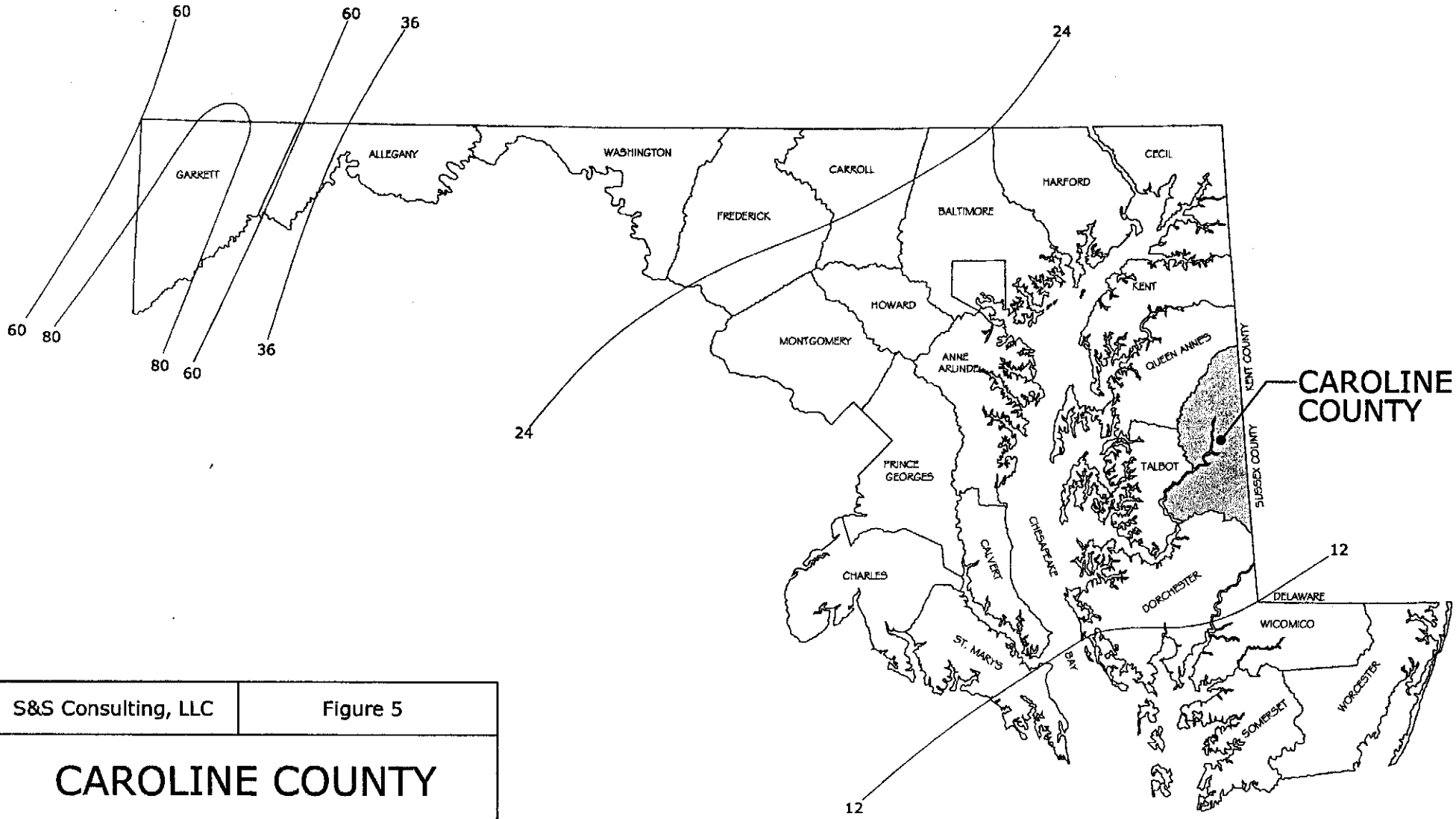
S&S Consulting, LLC	Figure 4

CAROLINE COUNTY

MEAN ANNUAL PRECIPITATION

Source: N.O.A.A.

Date: Sept. 20, 2004	Scale: N.T.S.



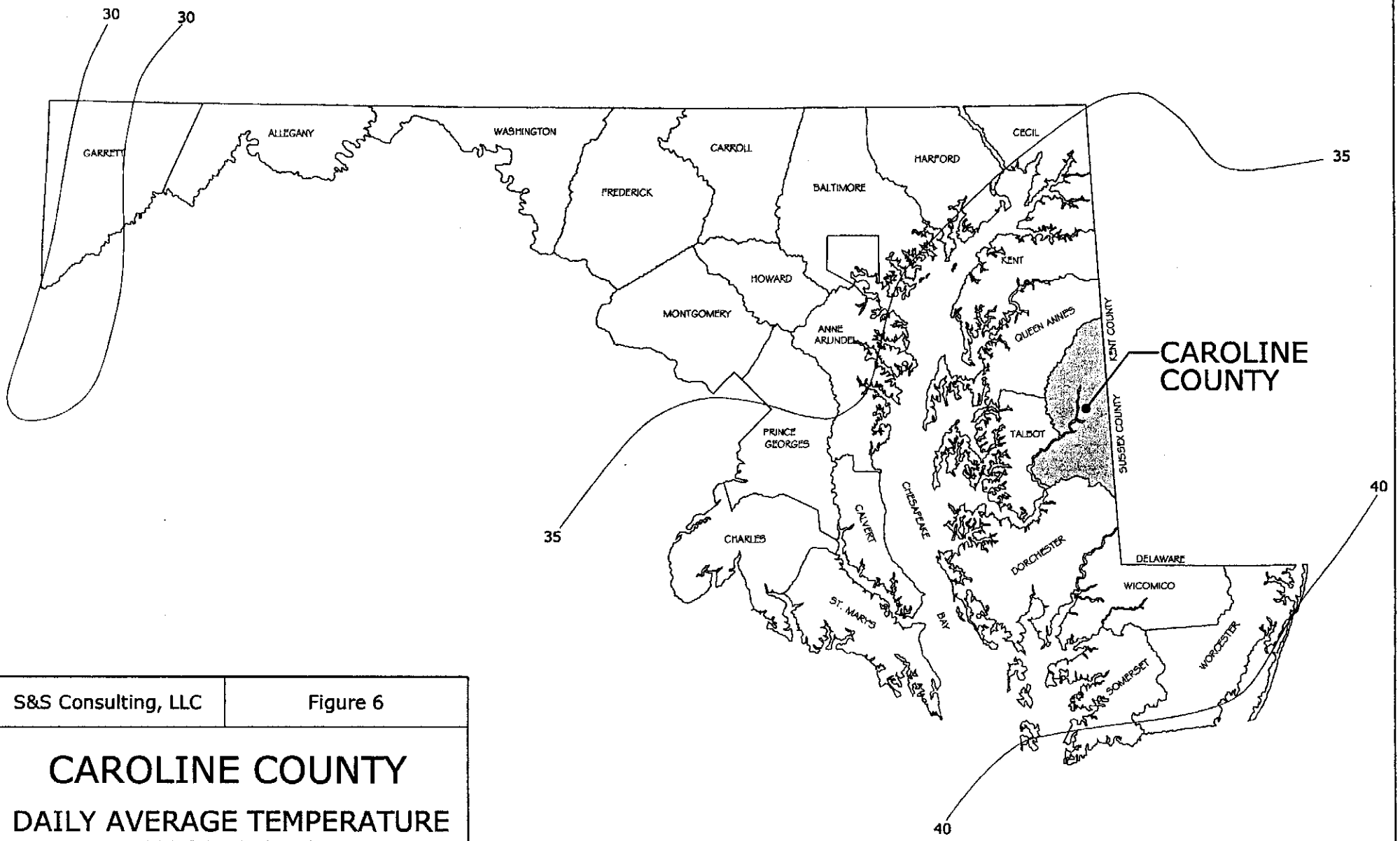
S&S Consulting, LLC	Figure 5

CAROLINE COUNTY

MEAN ANNUAL SNOWFALL

Source: N.O.A.A.

Date: Sept. 20, 2004	Scale: N.T.S.



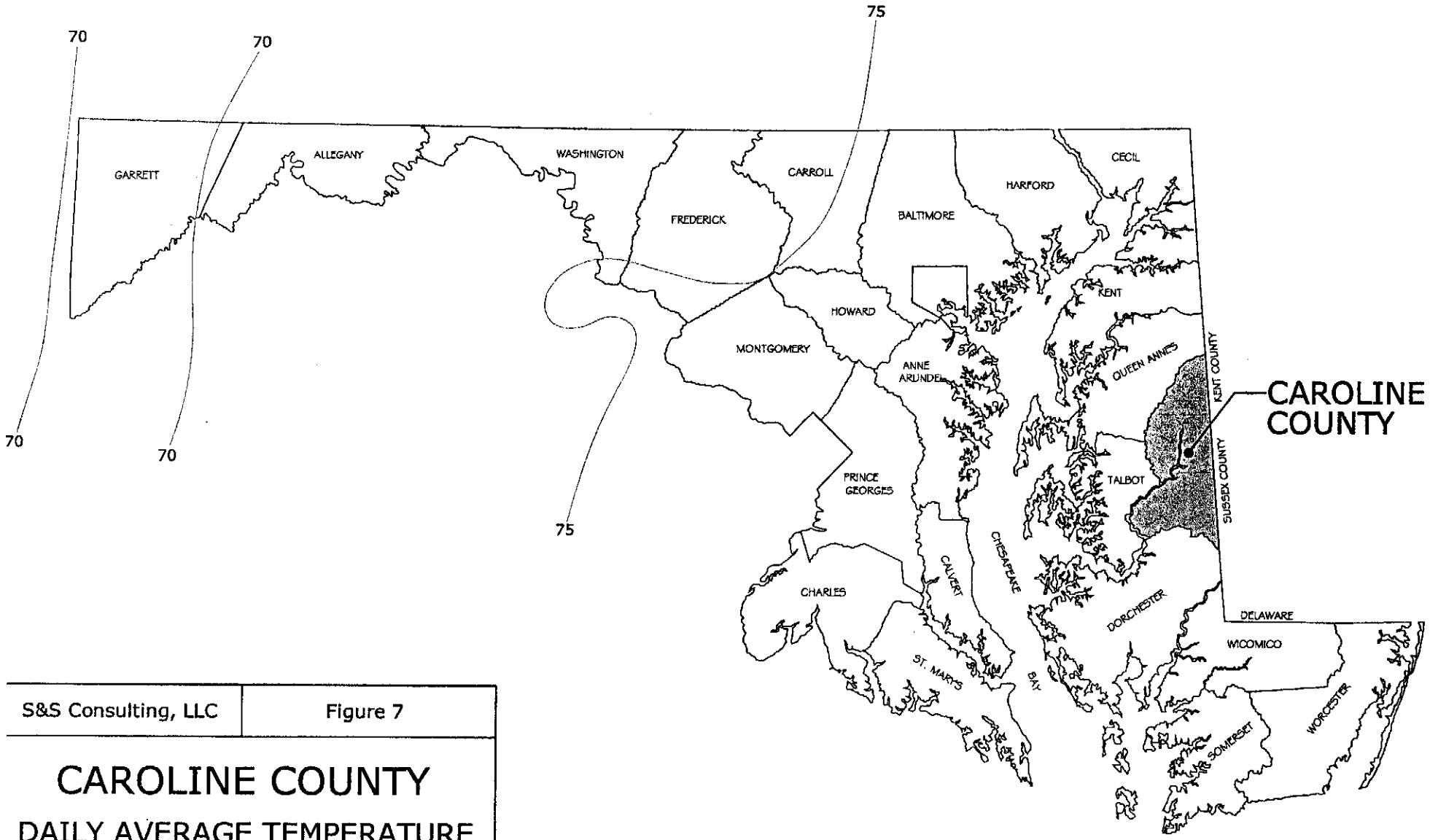
S&S Consulting, LLC	Figure 6

CAROLINE COUNTY

DAILY AVERAGE TEMPERATURE IN JANUARY

Source: N.O.A.A.

Date: Sept. 20, 2004	Scale: N.T.S.



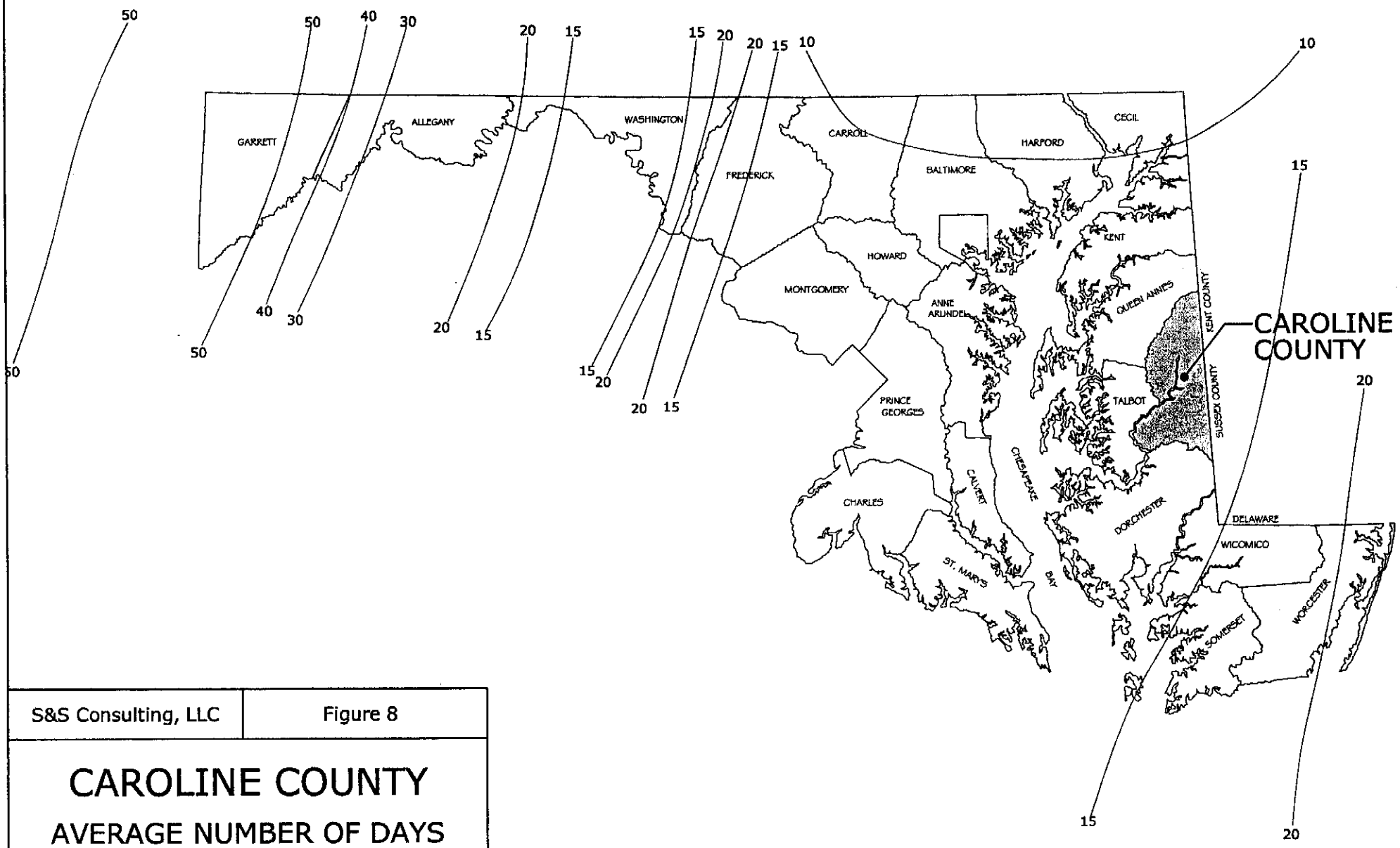
S&S Consulting, LLC	Figure 7

CAROLINE COUNTY

DAILY AVERAGE TEMPERATURE IN JULY

Source: N.O.A.A.

Date: Sept. 20, 2004	Scale: N.T.S.



S&S Consulting, LLC	Figure 8

CAROLINE COUNTY

AVERAGE NUMBER OF DAYS WITH DENSE FOG

Source: USDA-Climate and Man

Date: Sept. 20, 2004	Scale: N.T.S.

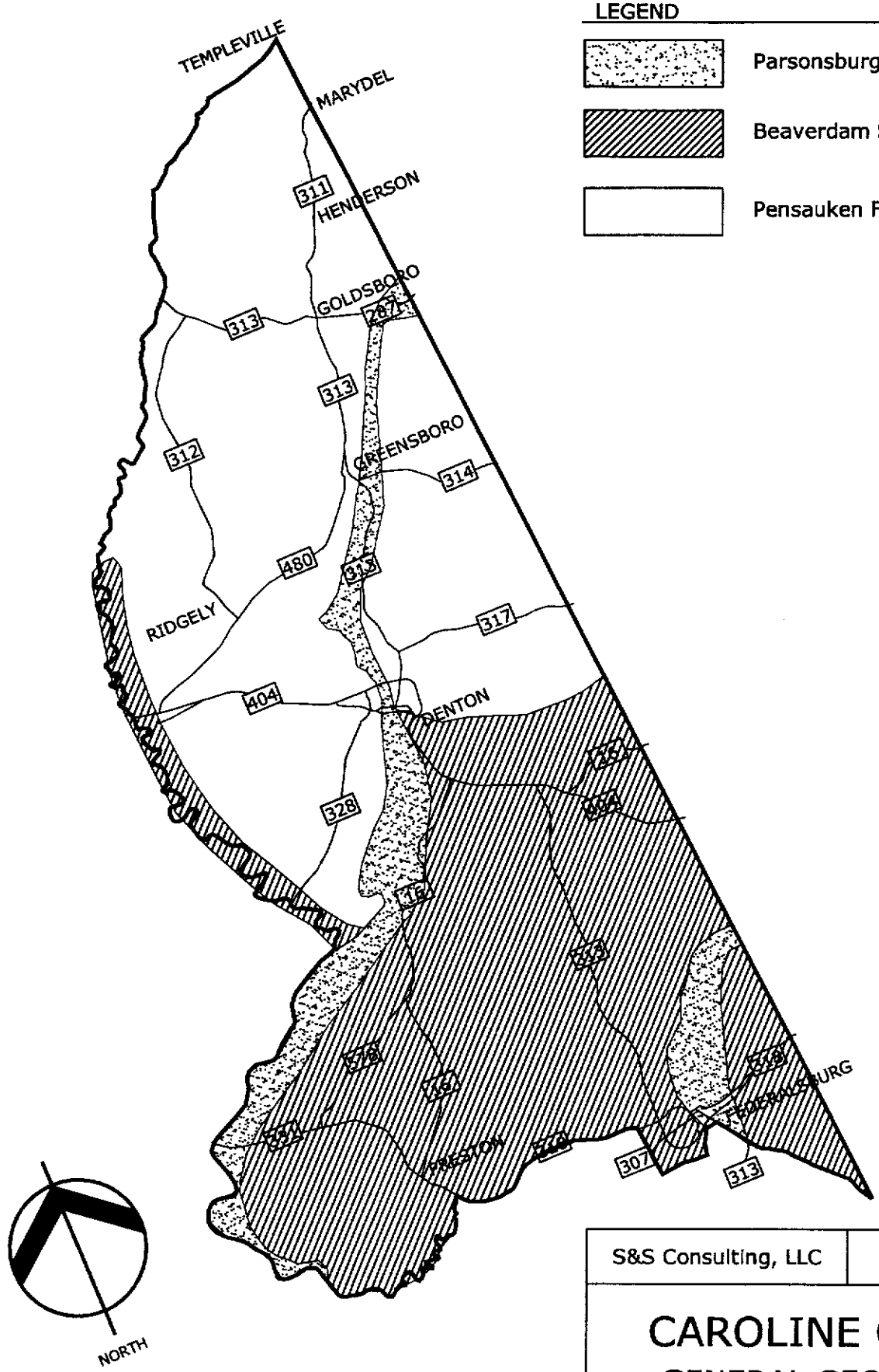
Weather & Climate Data

EASTON, MD

Month	Temperature Norms in Degrees	Precipitation Norms in Inches
January	36.6	3.47
February	37.2	2.95
March	44.4	3.95
April	54.6	3.48
May	64.7	3.88
June	73.2	3.36
July	77.3	4.74
August	75.6	5.03
September	69.2	3.95
October	58.3	3.18
November	47.9	3.53
December	37.9	3.13
Annual	56.4	44.65

Source: Climates of the States, NOAA

Figure 9

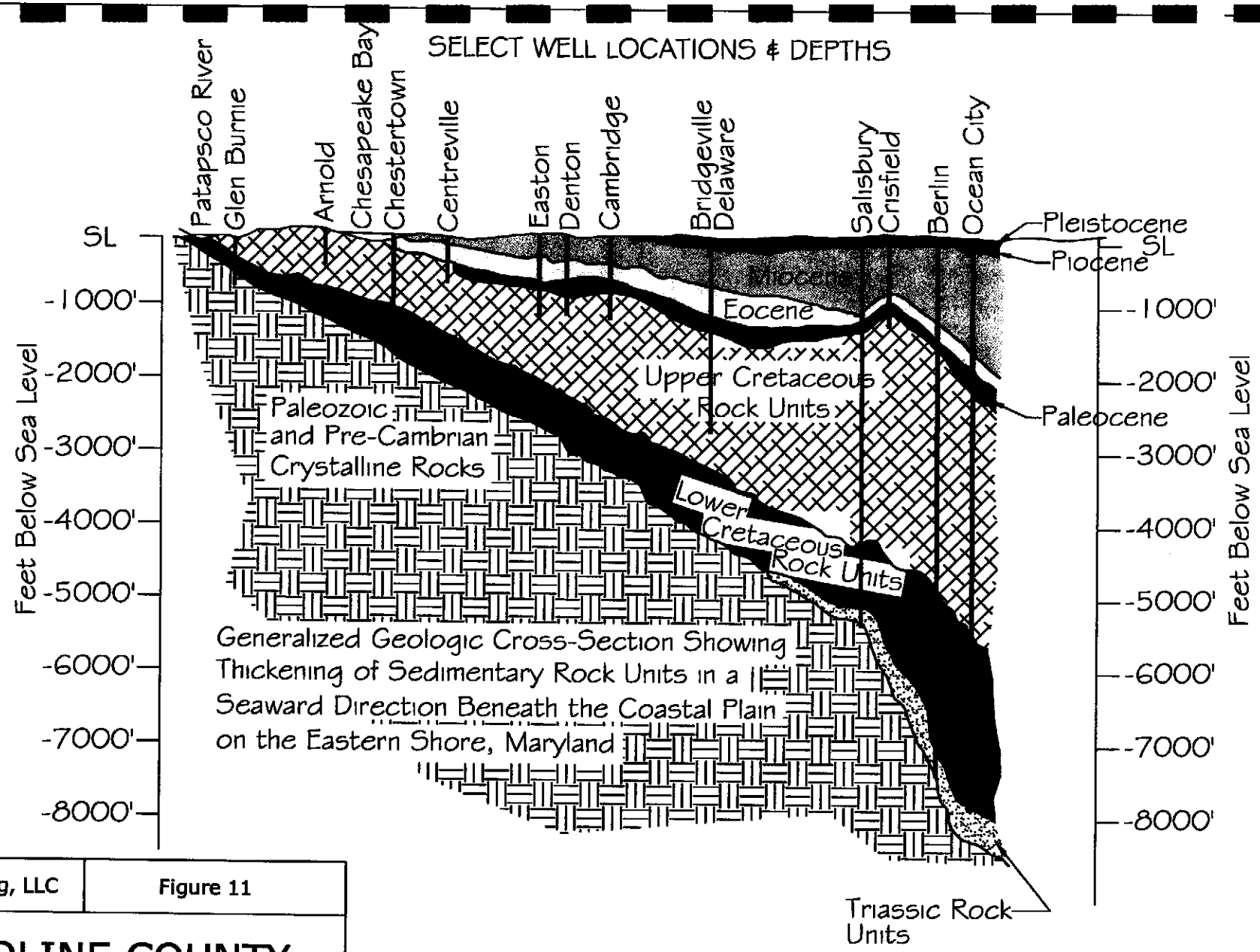


S&S Consulting, LLC	Figure 10

CAROLINE COUNTY
GENERAL GEOLOGY MAP

Source: Caroline Co. Planning and Zoning

Date: Sept. 20, 2004	Scale: 1"=4 mi.



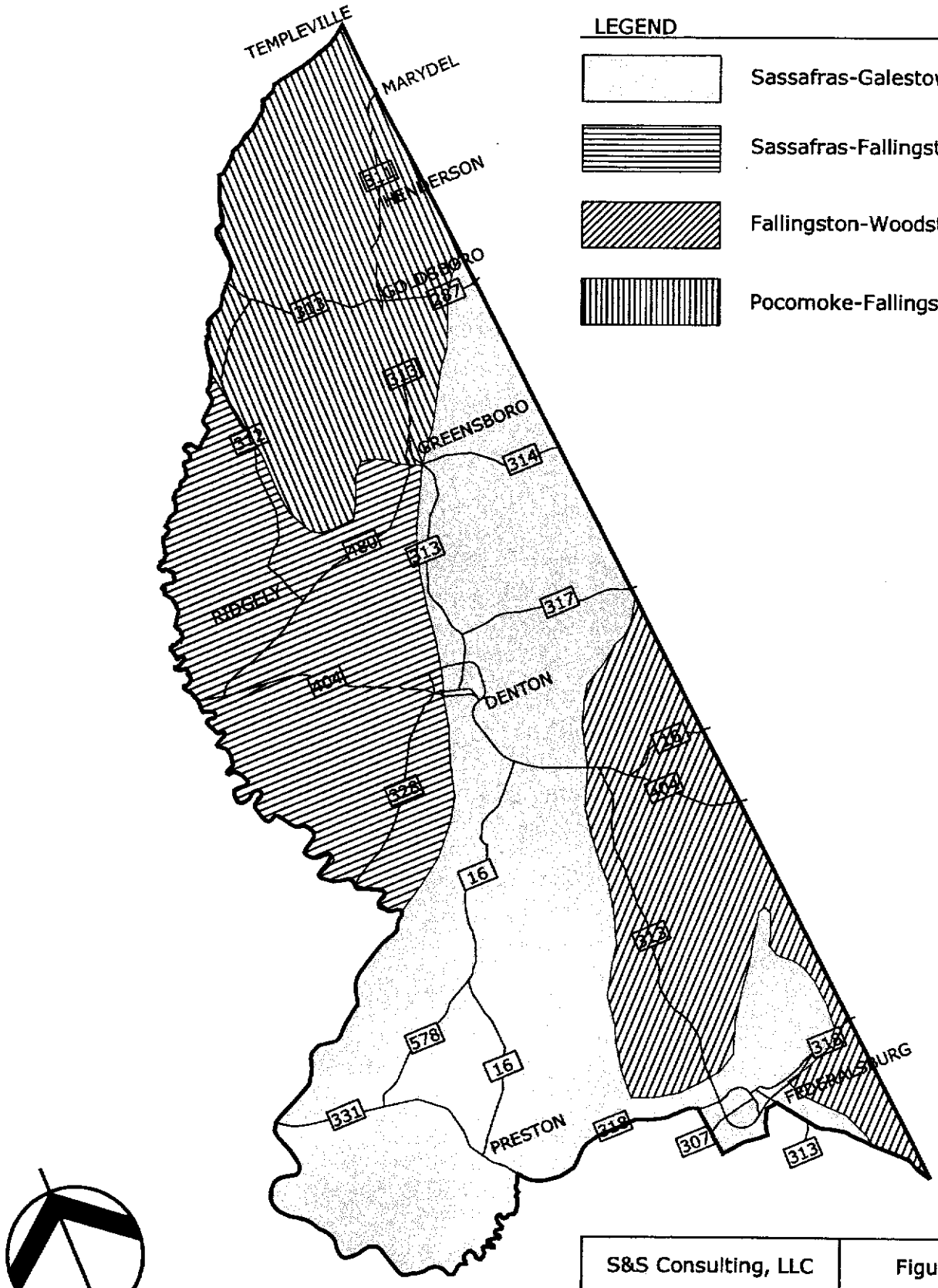
S&S Consulting, LLC	Figure 11

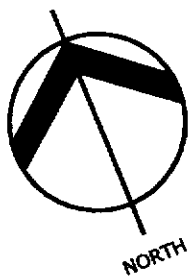
CAROLINE COUNTY

GENERALIZED GEOLOGIC CROSS-SECTION

Date: Sept. 20, 2004	Scale: N.T.S.

Source: *"A User's Guide for Artisan Aquifers of the Maryland Coastal Plain, Pt. 1"*
By Harry Hanson





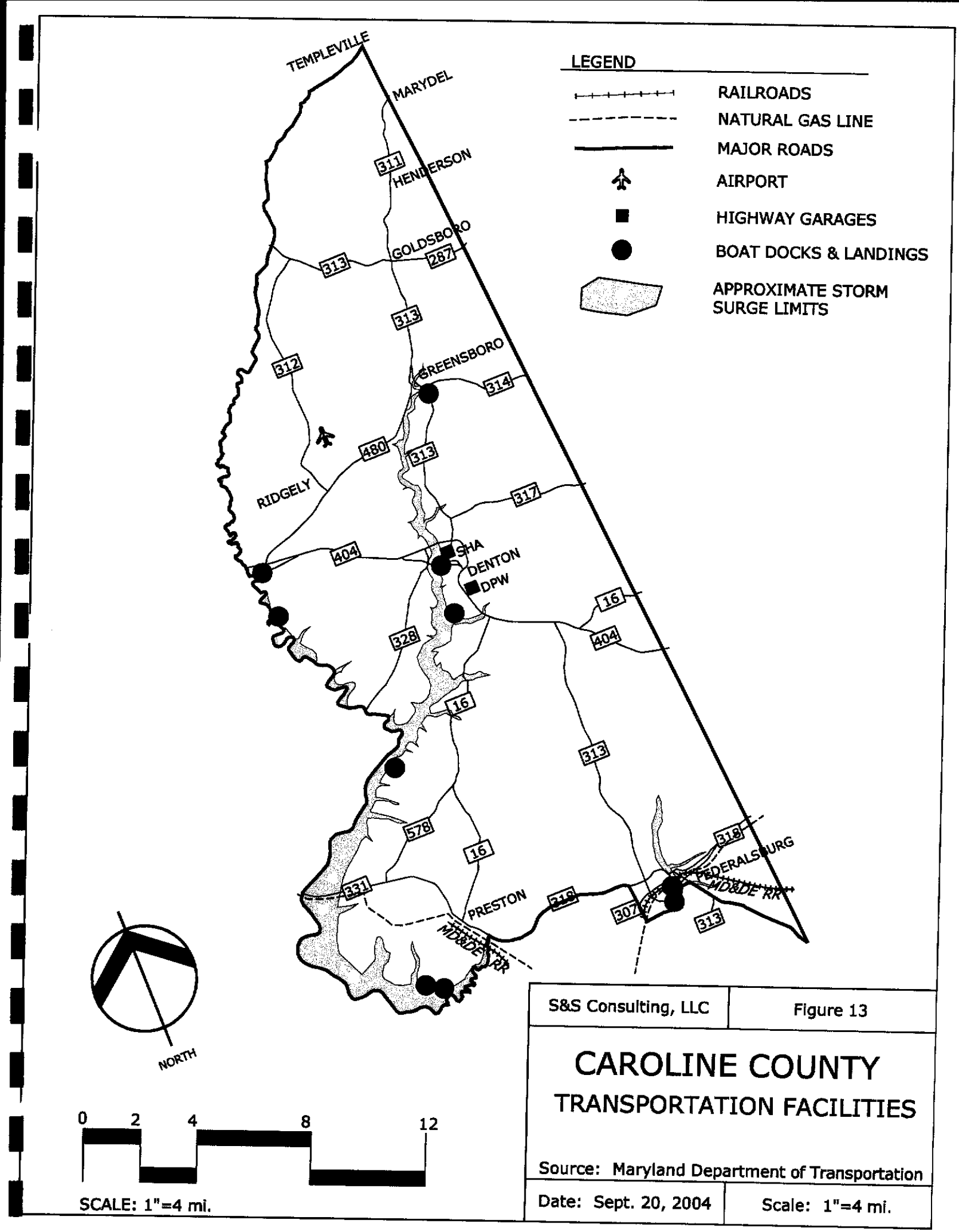
SCALE: 1"=4 mi.

S&S Consulting, LLC	Figure 12

CAROLINE COUNTY
GENERAL SOIL BOUNDARIES

Source: Caroline County Soil Survey

Date: Sept. 20, 2004	Scale: 1"=4 mi.



S&S Consulting, LLC | Figure 13

CAROLINE COUNTY
TRANSPORTATION FACILITIES

Source: Maryland Department of Transportation

Date: Sept. 20, 2004 | Scale: 1"=4 mi.

Labor Force & Employment

	2000	1990
Labor Force:	15,045	13.820
Employment:	14,297	13,229

EMPLOYMENT CATEGORIES

Category	2000
Agriculture, Forestry & Fishing	624
Construction	1,647
Manufacturing	2,054
Wholesale & Retail	2,253
Finance, Real Estate, Information	884
Transportation & Utilities	731
Professional, Health, Education & Admin.	4,693
Recreation & Tourism	736
Other Services	675

Government Employees 2,346

Source: U.S. Census 2000

Figure 14

POPULATION 2000

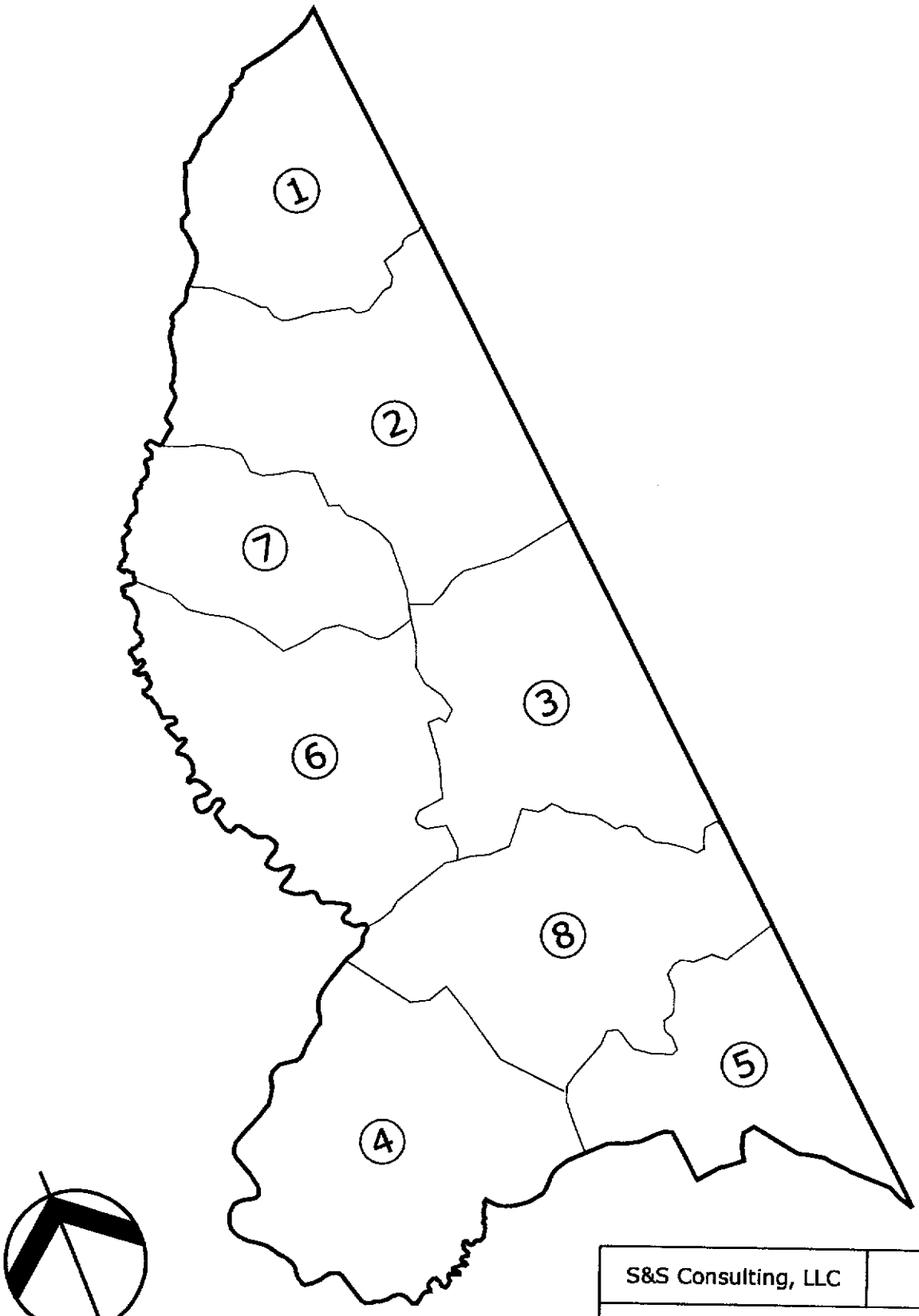
	2000	1990	1980	1970
County:	29,772	27,035	23,143	19,781
Change:	2,737	3,892	3,362	

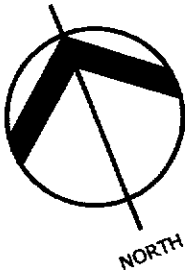
Municipalities – Population 2000		**Housing Units- 2000**
Denton	2960	1264
Federalsburg	2620	1130
Goldsboro	216	84
Henderson	118	46
Marydel	147	62
Preston	566	242
Ridgely	1352	553
Templeville	80	37
Greensboro	1632	674
Hillsboro	163	78
Total	9854	4170
Election Districts –Population 2000		**Housing Units-2000**
1. Henderson	3072	1142
2. Greensboro	5074	2006
3. Denton	5719	2381
4. Preston	3831	1605
5. Federalsburg	4696	1995
6. Hillsboro	2108	830
7. Ridgely	3231	1251
8. American Corner	2041	818
Total	29772	12028

* *See Figure 16 for Election District Map*

Source: U.S. Census 2000

Figure 15





SCALE: 1"=4 mi.

S&S Consulting, LLC	Figure 16

CAROLINE COUNTY
ELECTION DISTRICTS

Source: Maryland Department of Planning

Date: Sept. 20, 2004	Scale: 1"=4 mi.

LAND USE PERMITS

CAROLINE COUNTY

2000-2003

Unincorporated area only

Election District	Single Family	Modular	Double-wide	Single-wide	Total
1. Henderson	31	4	16	10	61
2. Greensboro	97	13	10	4	124
3. Denton	56	4	4	7	71
4. Preston	73	6	24	8	111
5. Federalsburg	31	2	8	7	48
6. Hillsboro	46	1	8	3	58
7. Ridgely	48	4	6	4	62
8. American Corner	59	3	9	5	76
Total	441	37	85	48	611

Source: Caroline County Permits Department

Municipal Housing Permits

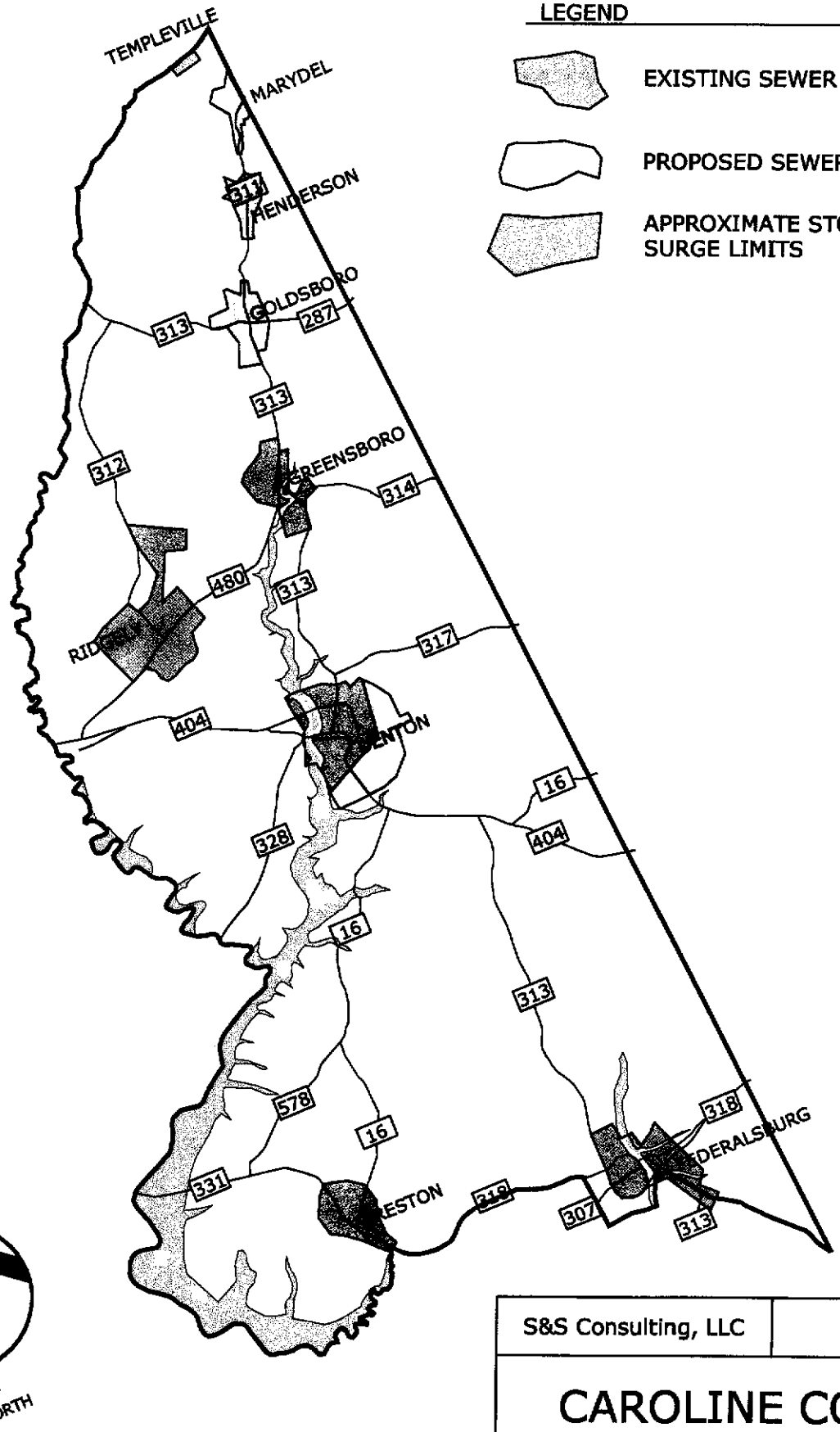
2003 Permits

Denton	28
Greensboro	15
Preston	1

Total for towns 2000-2003 95

Source: Maryland Department of Planning

Figure 17



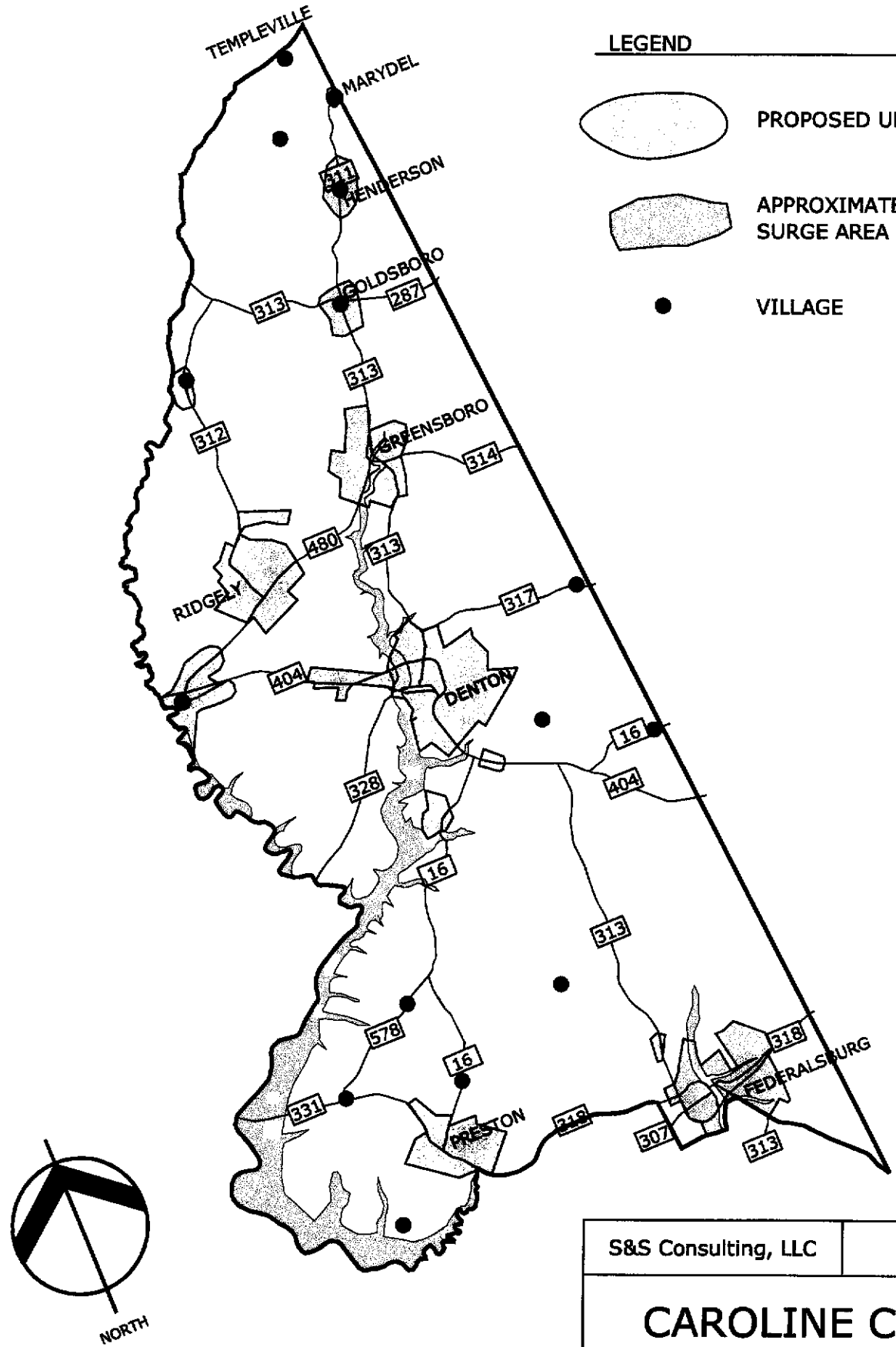
S&S Consulting, LLC	Figure 19

CAROLINE COUNTY

GENERALIZED SEWER SERVICE AREAS

Source: Caroline Co. Water and Sewer Plan

Date: Sept. 20, 2004	Scale: 1"=4 mi.



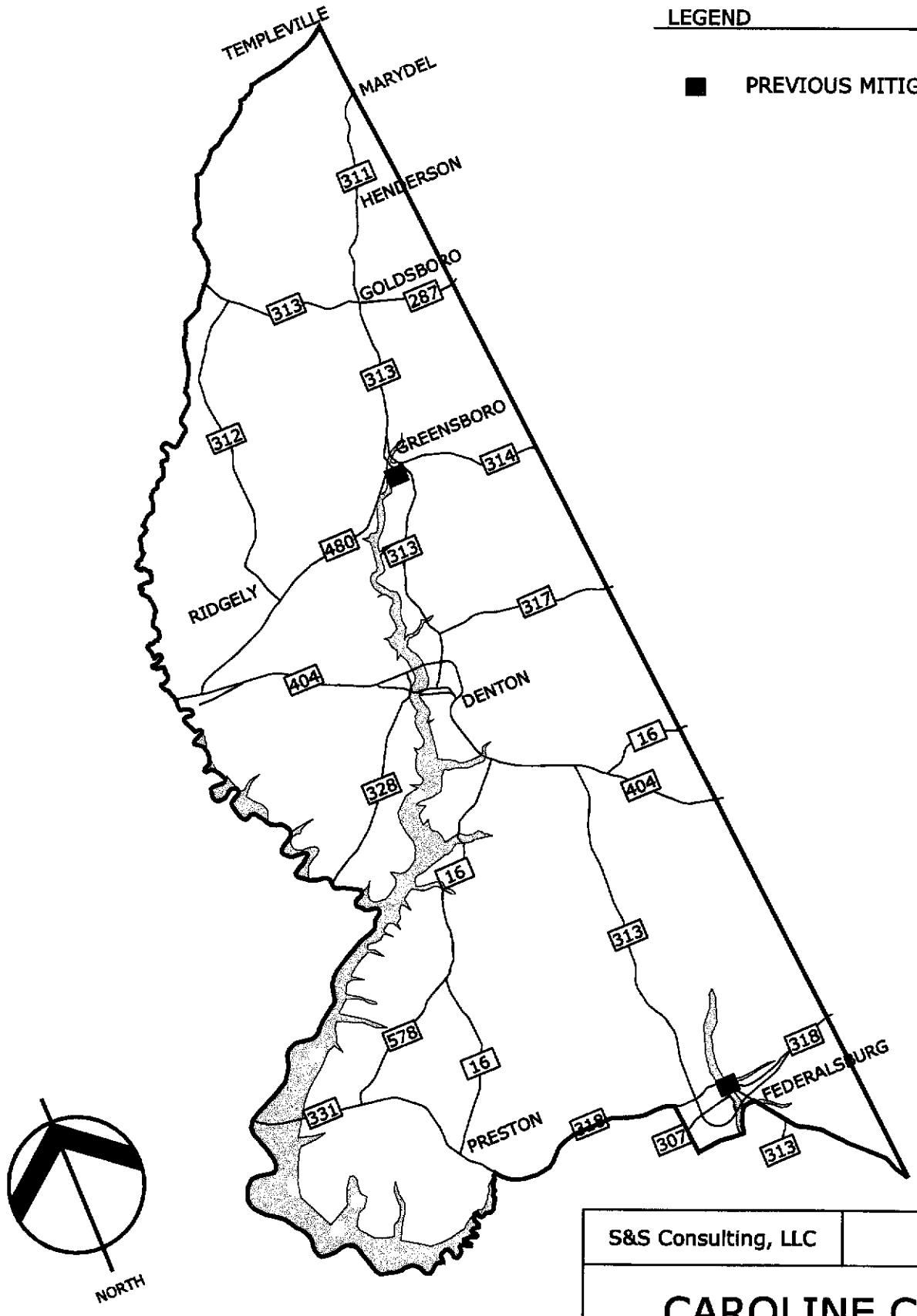
S&S Consulting, LLC	Figure 20

CAROLINE COUNTY

GENERALIZED PROJECTED URBAN LAND USE

Source: Caroline Co. Planning and Zoning

Date: Sept. 20, 2004	Scale: 1"=4 mi.



S&S Consulting, LLC	Figure 21

CAROLINE COUNTY
PREVIOUS MITIGATION EFFORTS

Source: Caroline Co. Emergency Management

Date: Sept. 20, 2004	Scale: 1"=4 mi.

BUILDING CODE REQUIREMENTS
CAROLINE COUNTY

New Construction

Wind Load	100 mph
Snow Load	25 lbs/sq. ft.
Depth of Footer	24"
Mobile Home Tie Down	Yes

Floodplain Requirements

First Floor	1 Ft. above base flood elevation
Utilities	1 Ft. above base flood elevation
Setback: New construction	100 Ft. from high water mark 25 Ft. from intermittent streams

ISO Building Code Effectiveness Report- Yes 2002

Source: Caroline County Planning & Zoning Office

Figure 22

Stream Peaks
Central Eastern Shore

Stream	Gauge Location	Floodstage CFS	Year	Event CFS – Approx.
Tuckahoe Creek	Near Ruthsburg	N/A	1955	1,620
			2001	1,750
Sallie Harris	Near Carmichael	3,810 – 100 yr	None	
		1,610 – 25 yr	None	
		845 – 10 yr	1960	1,240
Unicorn Branch	Near Millington	1,490- 100yr	None	
		1,220- 50 yr	1999	1,220
Faulkner Br.	Near Federalsburg	1,520 – 100 yr	1976	1,700
		1,000 – 25 yr	1979	1,100
			1984	1,300
Chicamacomico R.	Near Salem	750 – 100 yr	None	
		500 – 25 yr	1968	510
			1974	525
			1979	710
Choptank	Near Greensboro	8,340 – 100 yr	None	
		6,000 – 25-50 yr	1967	6,900
			1979	6,100
			1999	6,400
Morgan Creek	Near Kennedyville	2,060- 100 yr	None	
		1,330- 25 yr	None	
		938- 10 yr	1999	1,200
Nanticoke	Nr. Bridgeville, Del	3,370- 100 yr	None	
		2,040- 25 yr	1967	2,360

Source: U.S.G.S. Water Resources Data

Figure 23

WIND SPEED RATING SYSTEMS

BEAUFORT SCALE - WIND RATING SYSTEM		
Category	**Speed**	**Name**
0-6	0-31 mph	Various Breezes
7	32-38 mph	Moderate Gale
8	39-46 mph	Fresh Gale
9	47-54 mph	Strong Gale
10	55-63 mph	Whole Gale
11	64-75 mph	Storm
12	>75 mph	Hurricane

FUJITA SCALE - TORNADO RATING SYSTEM	
Category	**Windspeed**
F 0	40-72 mph
F 1	73-112 mph
F 2	113-157 mph
F 3	158-206 mph
F 4	207-260 mph
F 5	261-318 mph

SAFFIR – SIMPSON SCALE – HURRICANE RATING SYSTEM			
Category	**Max. Sustained Wind**	**Minimum Surface Pressure**	**Storm Surge**
1	74-95 mph	>980 mb	3-5 ft
2	96-110 mph	979-965 mb	6-8 ft
3	111-130 mph	964-945 mb	9-12 ft
4	131-155 mph	944-920 mb	13-18 ft
5	156+ mph	<920 mb	19+ ft

Source: National Oceanic Atmospheric Administration

Figure 24

HURRICANE RECORD
FOR
CAROLINE COUNTY

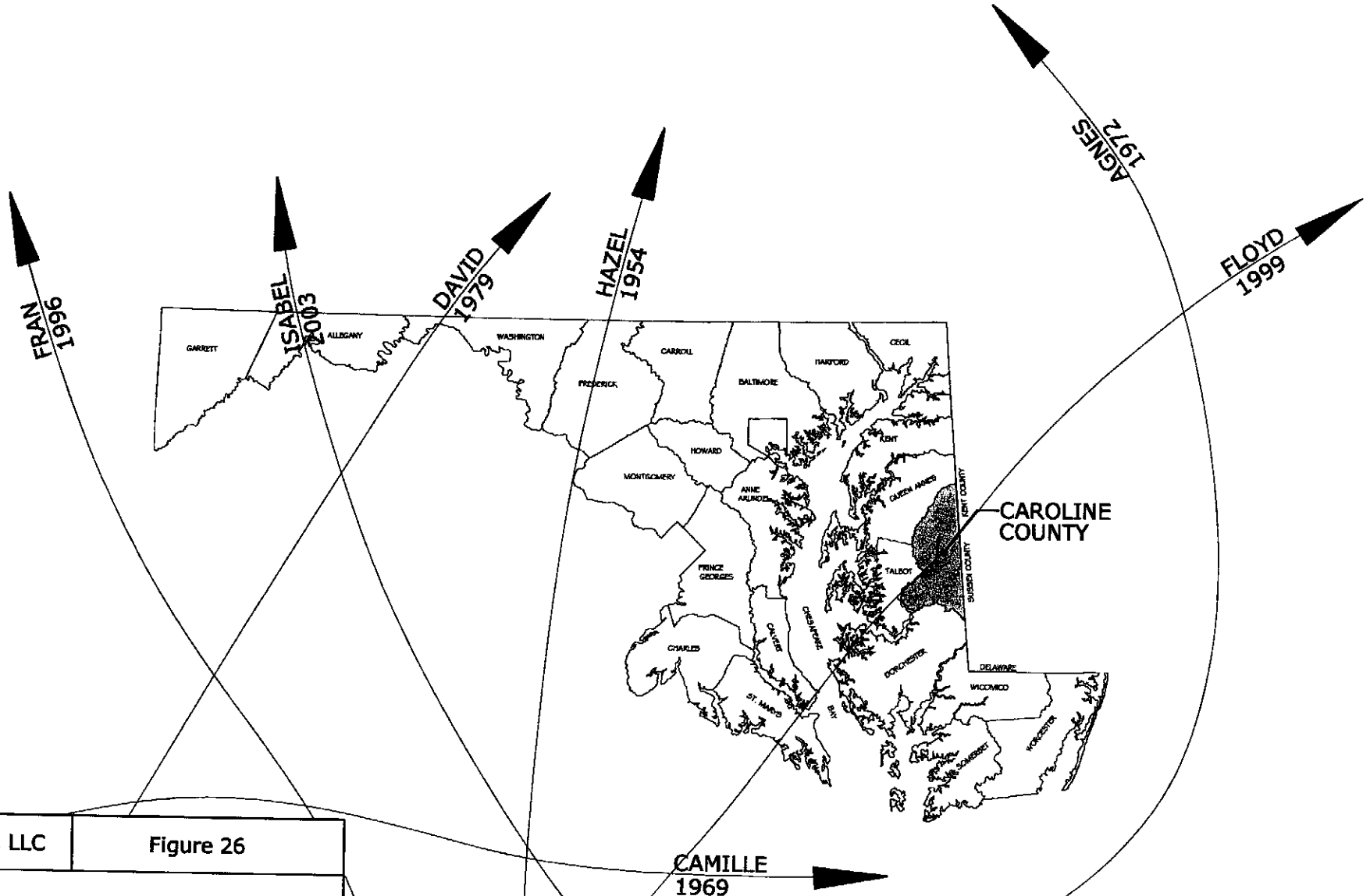
Note: Significant Hurricanes which passed within 60 nautical miles of Caroline County are shown on this chart. Maximum winds were recorded outside Caroline County.

YEAR	NAME	CATEGORY	MAXIMUM WIND SPEED	LOWEST PRESSURE
1893	N/A	3	105 mph	972 mb
1929	N/A	4	120 mph	936 mb
1933	N/A	3	105 mph	971 mb
1945	N/A	4	120 mph	951 mb
1954	Hazel	4	120 mph	937 mb
1955	Connie	4	125 mph	936 mb
1955	Diane	3	105 mph	969 mb
1996	Bertha	3	100 mph	960 mb
1999	Floyd	1	NA	NA
2003	Isabel	5	160 mph	NA

Source: Maryland Hazard Analysis 2000

Figure 25

Note: Storm Category represents the highest Saffir-Simpson rating in each storms history, not necessarily in Maryland. Categories range from 1-5, with 5 representing the highest wind speed.



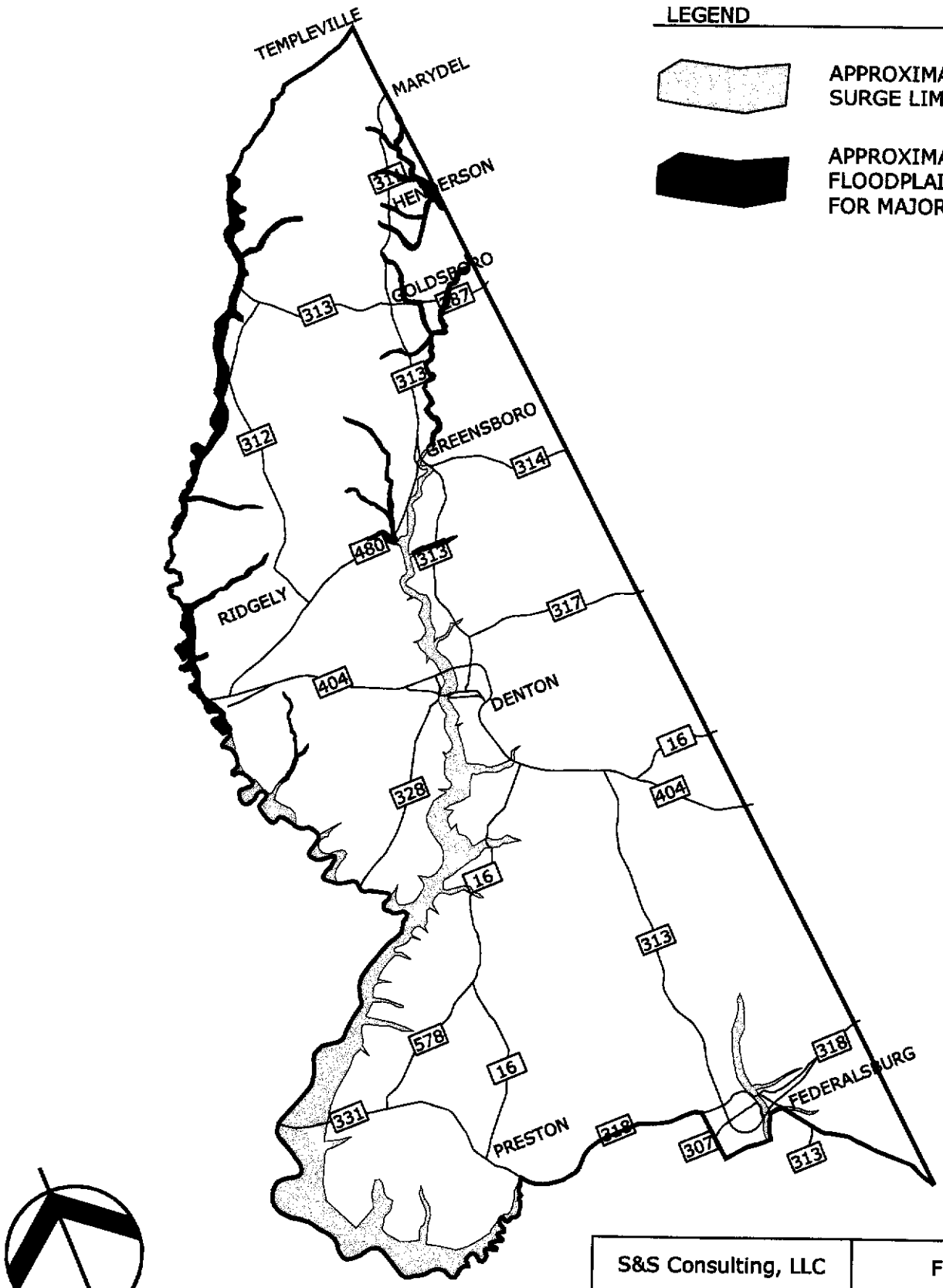
S&S Consulting, LLC	Figure 26

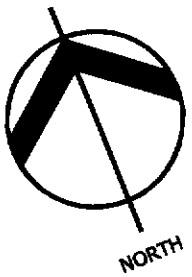
CAROLINE COUNTY

NOTABLE HURRICANE PATHS

Source: N.O.A.A.

Date: Sept. 20, 2004	Scale: N.T.S.





SCALE: 1"=4 mi.

S&S Consulting, LLC	Figure 27

CAROLINE COUNTY

APPROXIMATE CATEGORY 4 STORM SURGE AREA & 100-YEAR FLOODPLAIN

Source: Maryland Hazard Analysis & FIRM

Date: Sept. 20, 2004	Scale: 1"=4 mi.

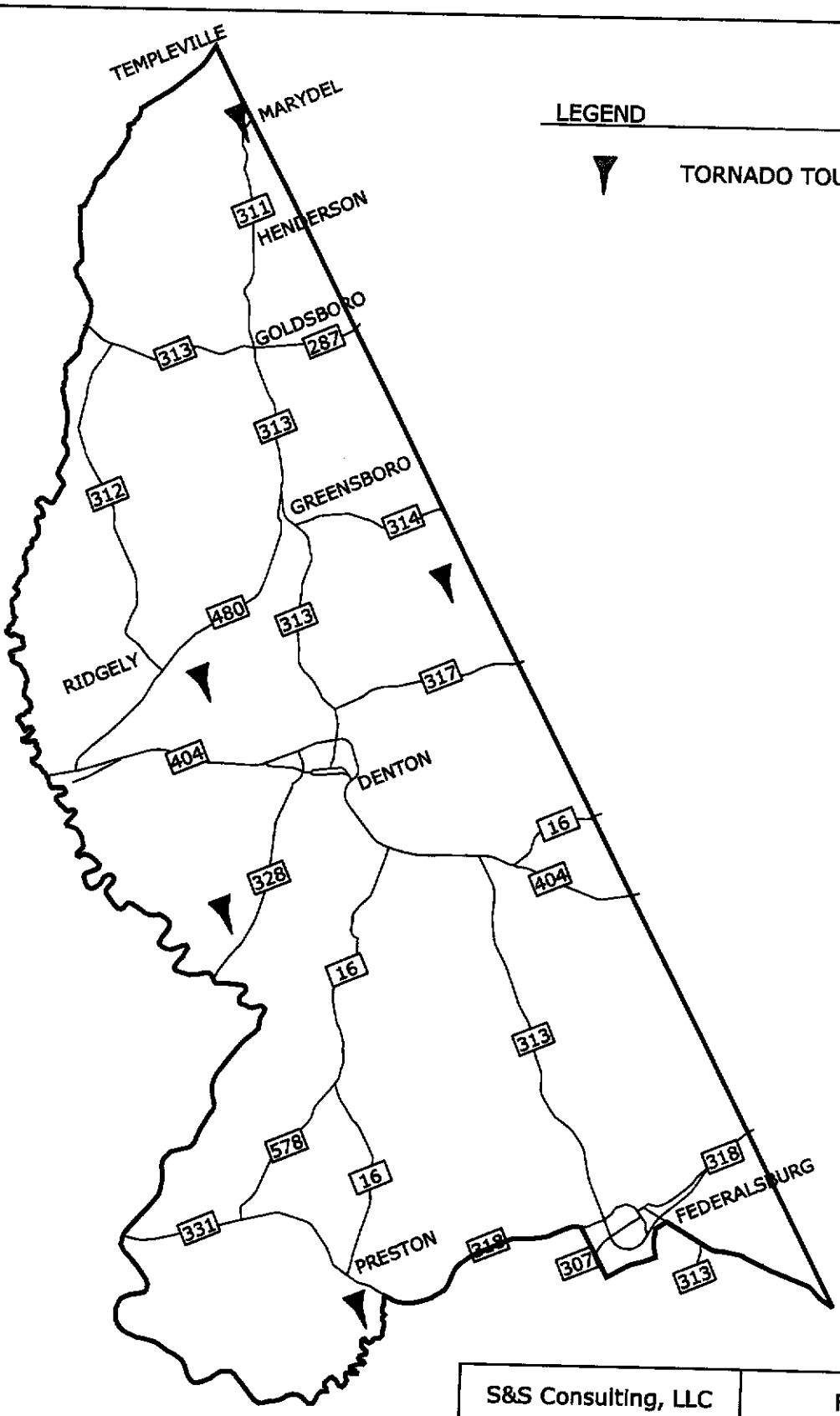
S&S Consulting, LLC	Figure 28

UNITED STATES

ANNUAL AVERAGE NUMBER OF TORNADOS, 1950-1995

Source: N.O.A.A.

Date: Sept. 20, 2004	Scale: N.T.S.



S&S Consulting, LLC	Figure 29

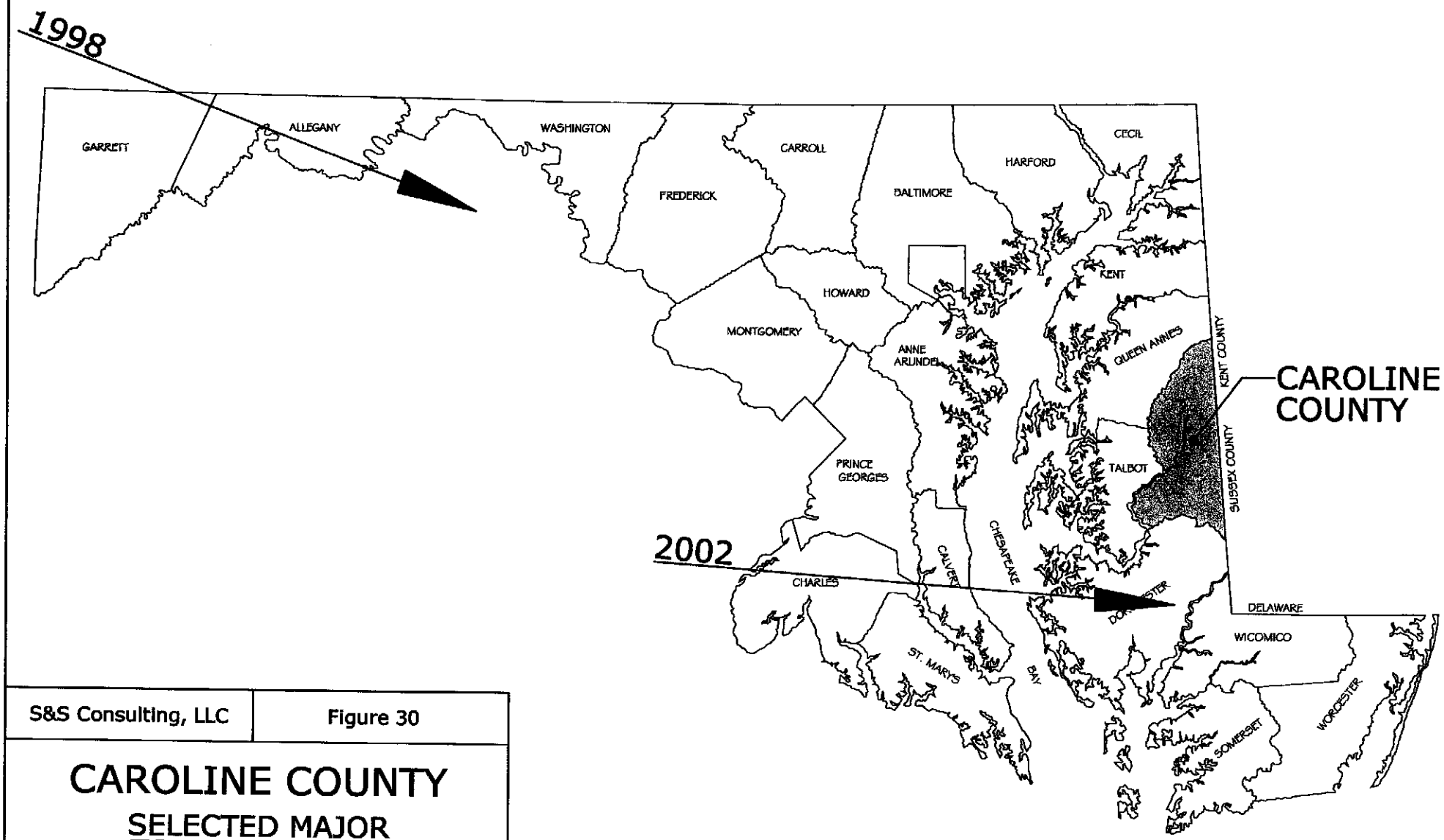
CAROLINE COUNTY

REPORTED TORNADO TOUCHDOWNS

BETWEEN 1950 & 1998

Source: Maryland Hazard Analysis

Date: Sept. 20, 2004	Scale: 1"=4 mi.



S&S Consulting, LLC	Figure 30

CAROLINE COUNTY

SELECTED MAJOR TORNADO PATHS

Source: Allegany County and Dorchester County Departments of Emergency Management

Date: Sept. 20, 2004	Scale: N.T.S.

CAROLINE COUNTY HAZARDOUS MATERIALS

Facility	Street Address	Material	Fire District
Verizon Central Office	310 Franklin St. Denton, Md. 21629	Sulfuric Acid	Denton
Verizon CDO	218 N. Main St. Federalsburg, Md. 21632	Sulfuric Acid	Federalsburg
Verizon CDO	104 W. Sunset Ave. Greensboro, Md. 21639	Sulfuric Acid	Greensboro
Verizon DCO	100 Harmony Road, Preston, Md. 21655	Sulfuric Acid	Preston
Verizon Tuckahoe ESS	11589 Ridgely Road, Ridgely, Md. 21660	Sulfuric Acid	Ridgely
Burris Logistics	3946 Federalsburg Highway, Federalsburg, Md.	Ammonia, Lead, Oil, Sulfuric Acid	Federalsburg
General Mills	300 Reliance Avenue, Federalsburg, Md. 21673	Sulfuric Acid	Federalsburg
Agway-Milford Fertilizer	4496 Laurel Grove Road, Federalsburg, Md. 21632	Paraquat	Federalsburg
Agway-Milford Fertilizer	702 W. Sunset Ave. Greensboro, Md. 21639	Paraquat	Greensboro
Overnite Transportation	1100 Ind. Park Rd. Federalsburg, Md. 21632	Diesel	Federalsburg
SOLO CUP Co.	RT 318 and Reliance Rd. Federalsburg, Md. 21632	CO2, Diesel, Propane	Federalsburg
Southern States	107 Backlanding Rd., Preston, Md. 21655	Various Chemicals	Preston
Hanover Foods Corp	502 Factory St. Ridgely, Md. 21660	Various Chemicals	Ridgely

Source: Caroline County Department of Emergency Management

Figure 31

WILDFIRES IN CAROLINE COUNTY

YEAR	NUMBER OF FIRES
1993	29
1994	28
1995	46
1996	11
1997	16
1998	32
1999	39
2000	14
2001	40
2002	39

Source: Maryland Department of Natural Resources

Figure 32

CAROLINE COUNTY, MD.

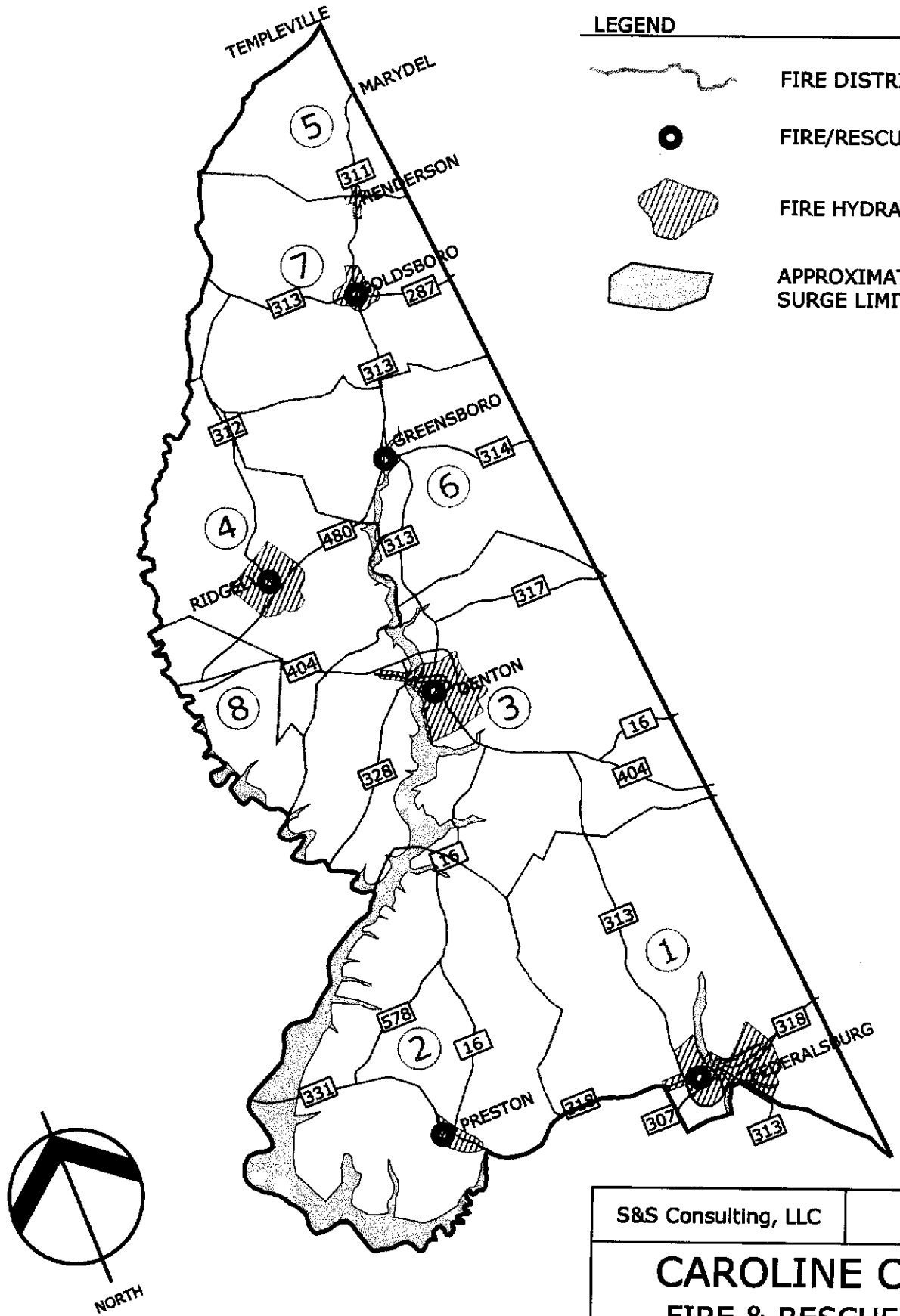
HAZARD EVENT SUMMARY

Event	Total
Drought	25
Extreme Heat	24
Stream Flooding	7
Coastal Flooding	2
Thunderstorm	37
Tornado	5
Snow-Freezing Rain	32
Hail	5
Cold Temperatures	7
High Winds	33
Fog	9
Smoke	1

* *Source: Caroline County Department of Emergency Management*

Note: This tabulation includes weather events recorded between 1/1/50 and 5/31/03 by Caroline Co. Emergency Man.

Figure 33



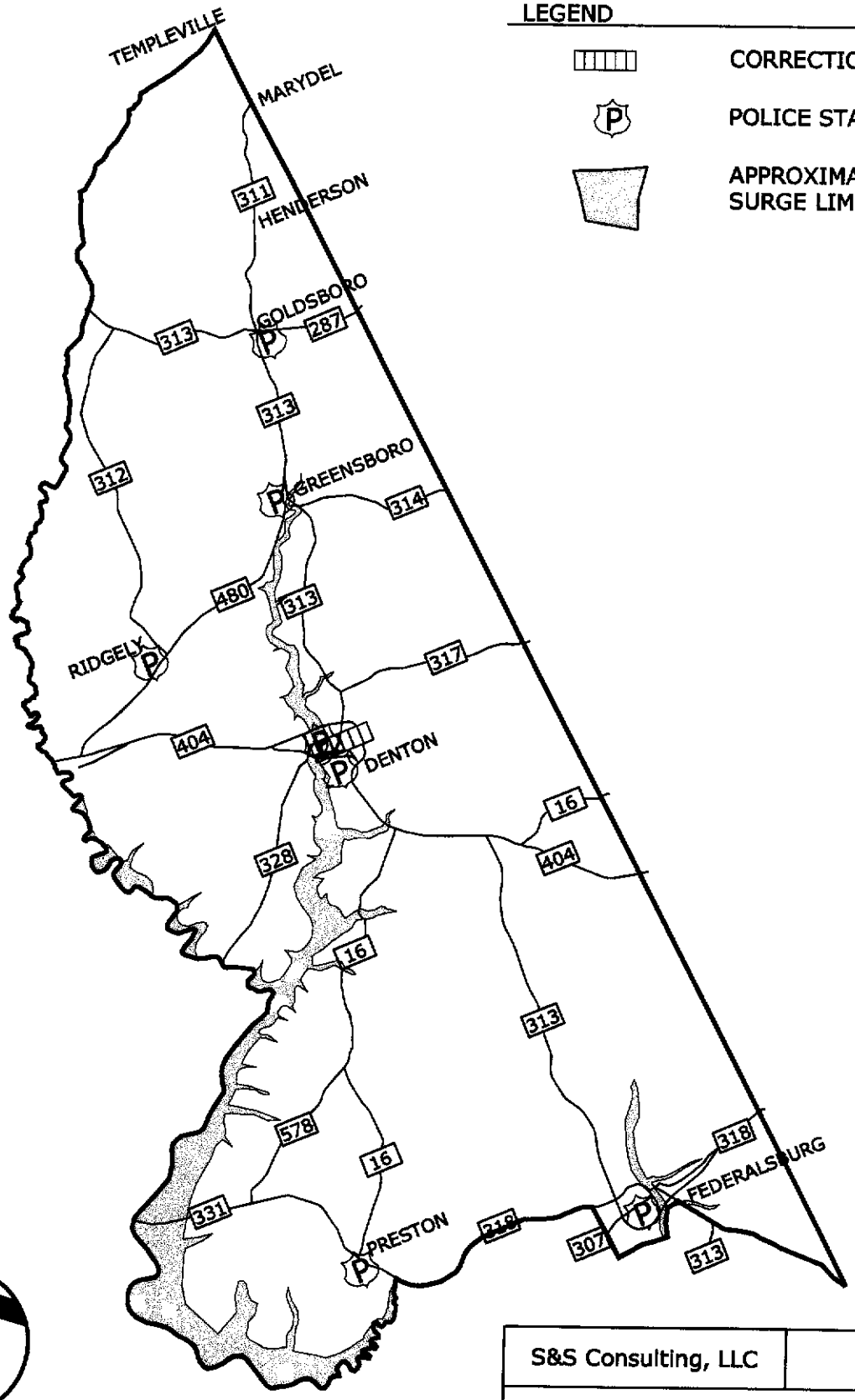
S&S Consulting, LLC	Figure 34

CAROLINE COUNTY

FIRE & RESCUE STATIONS; FIRE SERVICE AREAS; & HYDRANT SERVICE AREAS

Source: Caroline Co. Planning and Zoning

Date: Sept. 20, 2004	Scale: 1"=4 mi.



LEGEND

CORRECTIONS FACILITY

POLICE STATION

APPROXIMATE STORM SURGE LIMITS

NORTH

0 2 4 8 12

SCALE: 1"=4 mi.

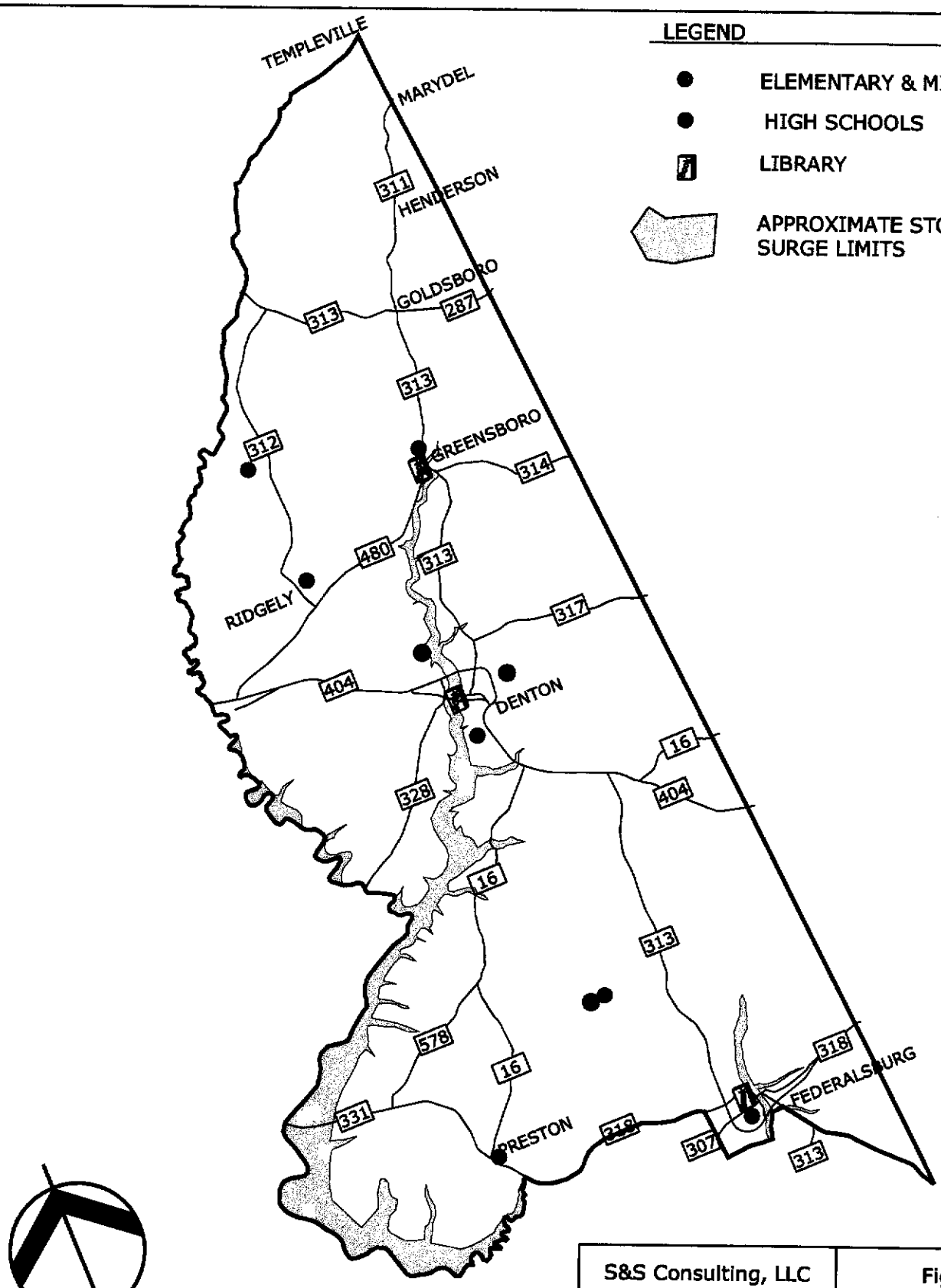
S&S Consulting, LLC | Figure 35

CAROLINE COUNTY

POLICE STATIONS & CORRECTIONAL FACILITIES

Source: Caroline Co. Planning and Zoning

Date: Sept. 20, 2004 | Scale: 1"=4 mi.



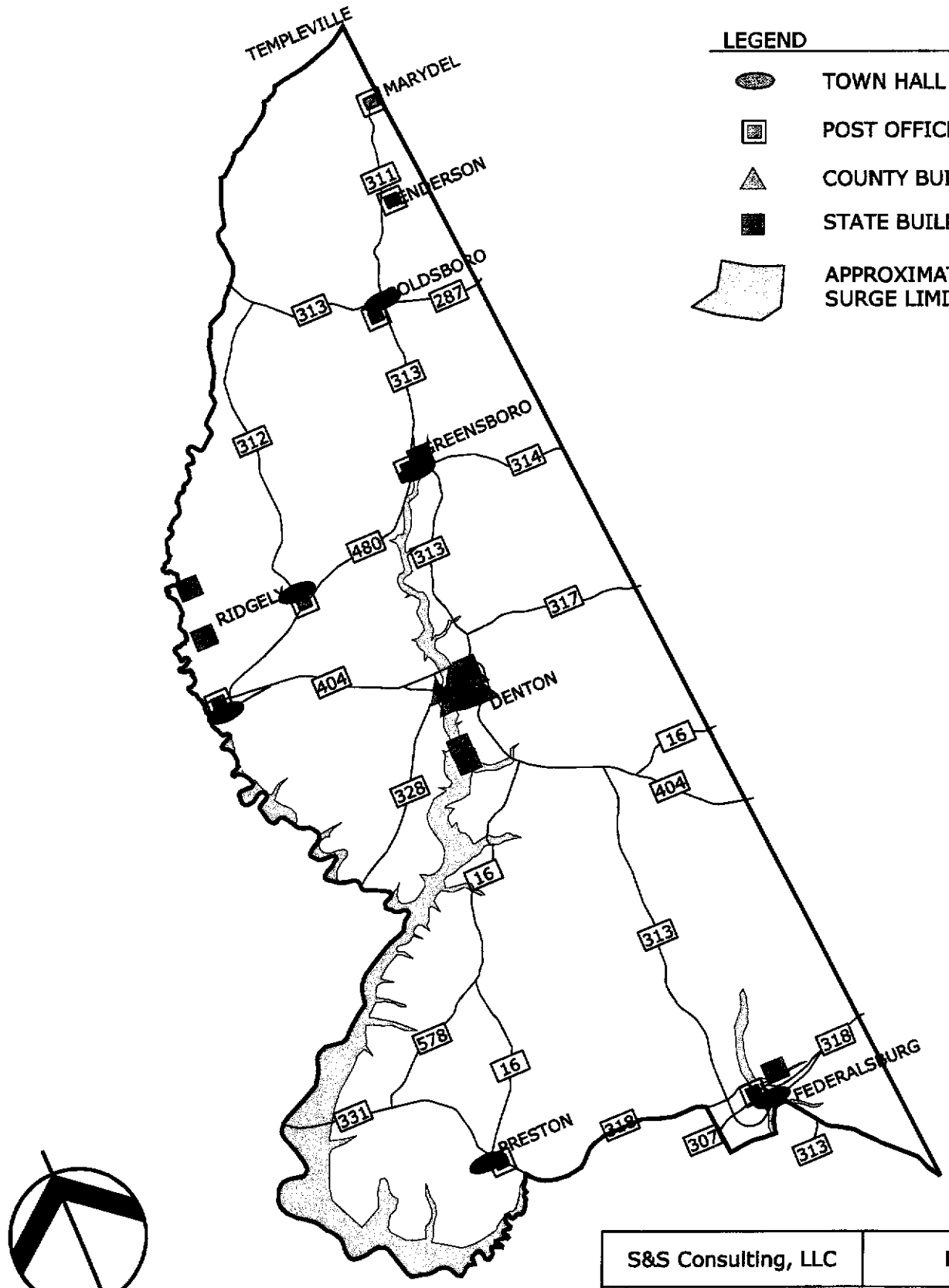
S&S Consulting, LLC | Figure 36

CAROLINE COUNTY

SCHOOLS & LIBRARIES

Source: Caroline Co. Planning and Zoning

Date: Sept. 20, 2004 | Scale: 1"=4 mi.



S&S Consulting, LLC | Figure 37

CAROLINE COUNTY

EXISTING GOVERNMENT BUILDINGS

Source: Caroline Co. Planning and Zoning

Date: Sept. 20, 2004 | Scale: 1"=4 mi.

APPENDIX

Hazard Mitigation Plan Meeting

2:00 P.M. March 4, 2004

Caroline County Health Department

The Caroline County Hazard Mitigation Planning Committee held its first meeting for the preparation of the above named plan in the County Health Department Conference Room. Those present included: Bryan Ebling and Cindy Towers, Emergency Management Agency; Kim Golden, Maryland Emergency Management Agency; Betsy Krempasky, Planning and Zoning; Chuck Emerson, Public Works; Scott Getchell, Town of Denton; David Kibler and Jeanette DeLude, Town of Greensboro and Virginia McGann and Ben Sansom, S & S Consulting.

After Ms. Towers opened the meeting, Ben Sansom asked Kim Golden to provide a brief overview of the state's Hazard Mitigation Planning Program. She noted that the state was preparing a state-wide Mitigation Plan and that each county needed to prepare a similar plan that looked at hazards from the local perspective. She pointed out that each jurisdiction had to have a plan in place in order to remain eligible for post disaster mitigation funding and to become eligible for pre-disaster mitigation programs. She also said that it was important for each jurisdiction to look at measures to mitigate damage to critical government facilities, at risk businesses and residential areas. During the discussion that followed she indicated that it was important for municipalities to be involved in the planning process so that they too would be eligible for these programs. She noted that in the aftermath of Hurricane Floyd in 1999, the Town of Greensboro had participated in the mitigation program.

Following her presentation Mr. Sansom distributed copies of the proposed plan outline and a copy of the procedure he planned to follow in completing the plan. He noted that his process would be to analyze those hazards that could affect the community, consider those facilities and residential properties that are at risk, develop an estimated cost of replacing them, and look at methods for mitigating damage to these facilities and structures.

He then asked the group to perform a risk assessment exercise by comparing the State Risk Assessment to the local perspective. He asked the committee members to rate each hazard from high to low based on their own experience and knowledge of the county. He noted that he would prepare a composite of risk for the next meeting.

Following the exercise, Mr. Ebling asked whether each town's water system would be reviewed as to its adequacy for fire fighting. Kim Golden noted that this should be addressed in the fire hazard narrative. Virginia McGann suggested that the county pull that information together so that it could be added to the plan. He also asked about drought and noted that the local ASCS agency had a good deal of information available on the effects of drought on the agricultural community. Cindy Towers noted that the

county had completed a commodity flow survey that indicated substantial truck traffic on Rt. 404 heading south and east toward Delaware.

The final item of discussion pertained to the Critical Facility listing which Mr. Sansom would soon be generating. He pointed out that he planned to develop this list by Fire District and type of facility. He showed the group a sample listing from Queen Anne's county and noted that it would contain the hazard type as well as information pertaining to location and value for high hazard facilities.

Following this discussion, the meeting adjourned at 3:15 P.M. The group agreed to meet for the second meeting on April 15, 2004 at 1:30 P.M. in Room 255 of the Health Center.

Hazard Mitigation Plan Meeting

1:30 P.M. April 15, 2004

Caroline County Health Department

The Caroline County Hazard Mitigation Planning Committee held its second meeting for the preparation of the above named plan in the County Health Department Conference Room. Those present included: Bryan Ebling and Cindy Towers, Emergency Management Agency; Betsy Krempasky, Planning and Zoning; Chuck Emerson, Public Works; and Virginia McGann and Ben Sansom, S & S Consulting.

After Ms. Towers opened the meeting, Ben Sansom presented the results of the Risk Analysis which the group had performed at the previous meeting. He noted that the committee rated extreme heat and stream flooding as the highest risks. Most other hazards were rated as medium or medium low risk. He noted that the committee's results were somewhat different from the State's risk analysis. Virginia McGann pointed out that the state was comparing county to county rather than looking at risks for individual county.

Ben then presented copies of the introduction to the plan and a copy of the Fire/Explosion section of the plan. He noted that he wanted to keep the discussion of each hazard to One or two pages so that the person using the plan could easily focus on a particular hazard. During the Fire/Explosion discussion he noted that he had included copies of maps from the Water and Sewer Plan showing each water system. He had denoted those areas having lines of 6" or greater since that was the minimum size considered adequate for fire suppression. Betsy Krempasky noted that many of the maps were out of date, but that new maps would only show service areas and not water lines. Chuck Emerson noted that each town had provided the information used in the original plan, but that many of the communities had no maps showing water lines. He indicated the information was primarily in the memory of town employees, many of whom were now retired.

The next item of discussion included Critical Facilities and the estimated cost to replace structures that were subject to flooding or storm surge. Ben pointed out that there were more than 240 Critical Facilities included at this point. He asked if there was information pertaining to electric substations and communications towers because these facilities should be included in the plan. He also noted that more than 340 residential units were in the mapped storm surge area along with 51 Critical Facilities. These at risk Critical facilities include 28 bridges and 10 marina/dock facilities. Chuck Emerson noted that his department had established values for county bridges and marinas. He also noted that culverts were more susceptible to damage from flooding than bridges, since water tended to back up and erode the area around the culverts. He said that he would provide information on bridges, culverts and marina/ramps to Cindy Towers.

Bryan Ebling said that it appeared the plan was focusing mostly on Flooding, rather than looking at other hazards. Virginia Mc Gann pointed out that flood zones were the only well documented hazard areas that could be used to document structures that were at risk. If such information existed for other hazards, S & S would include it in the plan. Mr. Sansom pointed out that when committee members reviewed the entire plan they would see a great deal of information on other hazards. He noted that the Major Fire/Explosion section would include maps showing the service areas and size of waterlines based on the best available information.

During the discussion on Communication Towers, Bryan asked if the plan would address the microwave system in use in Caroline, Talbot and Queen Anne's Counties. He pointed out that the system needed to have a series of looped connections so that the loss of one connection would not isolate a station. Virginia McGann noted that if this could be shown to be a mitigation project it could be included.

Following this discussion, the meeting adjourned at 3:15 P.M. The group tentatively agreed to meet for the third meeting on May 18, 2004 at 1:30 P.M. at the Health Center.

Hazard Mitigation Plan Meeting

1:30 P.M. May 18, 2004

Caroline County Health Department

The Caroline County Hazard Mitigation Planning Committee held its third meeting for the preparation of the above named plan in the County Health Department Conference Room. Those present included: Bryan Ebling and Cindy Towers, Emergency Management Agency; Chuck Emerson, Public Works; Scott Getchell, Denton DPW; David Kibler and Jeanette DeLude, Town of Greensboro; Shirley DeShields, Town of Federalsburg; and Virginia McGann and Ben Sansom, S & S Consulting.

After Cindy Towers opened the meeting, Ben Sansom presented a revised Critical Facilities listing that included the information forwarded by Mr. Emerson after the April 15 meeting. Mr. Kibler noted that the cost estimates for Wastewater Treatment Plants was extremely low. Ms. McGann noted that S&S had asked several engineers for cost estimates for various facilities, but that if a community had specific values for certain facilities S&S prefers to utilize local data in the plan. Mr. Kibler asked if the individual Critical Facilites sheets could be e-mailed to municipalities so that any changes could be entered directly into each file. Ms. McGann indicated that this could be done.

Cindy Towers asked about the number of nursing homes shown on the list. Mr. Sansom indicated that he had included the Wesleyan Retirement Community at Denton. Ms. Towers noted that there were many assisted living facilities in the county and wondered if these could be included. She indicated that she would forward a list to S&S.

Mr. Kibler noted that Water Tanks should all be noted as "L" for Tornado risk and Wastewater Treatment Plants should be noted for Hazmat risk. Mr. Ebling asked why some facilities were rated "H" for storm surge but not for stream flooding. Ms. McGann indicated that S&S would review the Flood Maps to clear up this inconsistency. Mr. Ebling also noted that the railroad in the northern part of the county hadn't been used for many years and wondered if the rail crossings in that area should be taken off the list. Cindy also noted that it appeared S&S had used the Queen Anne's County median income for Caroline County in the draft County Profile. Mr. Sansom said he knew how that happened and would make the correction before the final draft was sent out for review.

The next item of discussion related to the Fire suppression question that had been discussed at the April meeting. Mr. Sansom noted that he had contacted each municipality concerning the size of water mains in their community and had received information from most communities indicating that most problem areas had either been addressed or were planned for improvements in the near future. Planned or potential projects would be included in the Mitigation Strategies section of the plan. Mr. Getchell and Mr. Kibler provided water service maps of their communities at the meeting.

Ms. McGann then presented a draft Goals and Objectives statement for the plan and asked each member of the group to participate in an exercise to rank various mitigation measures. She noted that these action items would be used to develop a project list for the county. Since this is an important step in the planning process, she asked each committee member to give the ranking some thought after the meeting and then fax their results to S&S. She also noted that once this information was compiled and the Critical Facilities lists were reviewed and updated, we would be ready to prepare the draft plan.

Ms. McGann noted that the draft plan would be sent to the Emergency Management Agency and MEMA prior to being released for public review. Following this discussion, the meeting adjourned at 3:15 P.M.

June 21, 2005
Denton, Maryland

s previously announced, the regularly scheduled meeting of the County Commissioners of Caroline County, Marylanc **convened** at 9:30 a.m. in the Hearing Room, Courthouse, Denton.

Attending:
John W. Cole, President
Mario J. Gangemi, Member
Charles C. Cawley, County Administrator
Absent:
Roger L. Layton, Vice President

The County Commissioners meeting **convened** with **prayer** led by Rev. Bruce Lecates, New Life Wesleyan Church Greensboro, followed by the **Pledge of Allegiance.**

On individual motions by Mr. Gangemi, the Commissioners **approved the minutes of June 7, 2005 and the minutes o June 14, 2005, which had previously been deferred. Vouchers** #85909 - #86034 were approved for payment. Th **direct deposit bi-weekly payroll** was approved.

On individual motions by Mr. Gangemi, the Commissioners approved and President Cole signed the following **purchas orders:**

#38484 - $2,500 – Pitney Bowes – replenish the postage meter for the Caroline County Board of Election Supervisors;

#38485 - $3,280.10 – State Board of Elections – final bill for FY 2005 on leased voting equipment and system costs;

#39288 - $2,745 – Amy J. Malkus, Ph.D. – professional services for grant writing and evaluation activities in conjunction with the juvenile drug court program administered by the Caroline County Circuit Court.

Following introduction by Margaret Myers, outgoing president of the **Caroline County Human Services Council**, the Commissioners met with Renee Woodworth, administrator, Caroline County Human Services Council, Inc. Ms. Woodworth described to the Commissioners the parameters of the FY 2006 Community Partnership Agreement (CPA), which has been modified to include language building on the Governor's Executive Order that address the sunset of Article 49D, to ensure ongoing services are provided to the children and families of Caroline County. Following discussion, the Commissioners, on motion by Mr. Gangemi, **approved and President Cole signed the FY 2006 Community Partnership Agreement (CPA) between the Caroline County Human Services Council, Inc., the State of Maryland and Caroline County**. Ms. Myers stated that she has served on the Council for the past nine years and has reached her term limits, however, anticipates returning to the Council following the required year's leave. Ms. Myers thanked the Commissioners for their past support and that the agency is now a non-profit organization.

Mr. Cawley **provided information to the Commissioners regarding septage and waste haulers and the issue of leachate**. Mr. Cawley stated that he recently attended a meeting with Talbot County, and Betsey Krempasky, Caroline County Planner, regarding the issues of septage and disposal of septage by waste haulers in the region. Under State law, counties must designate a location for the disposal of septage by waste haulers. Caroline County previously designated Mansfield, located in Talbot County and an area in Dorchester County. Mr. Cawley stated that Mansfield has recently indicated closing, therefore, Talbot County has taken the lead on researching other options on a regional basis. Talbot County has hired an engineer to study leachate and the disposal of septage and is requesting partnership by Caroline County and potentially other surrounding counties. Mr. Cawley stated that the study will cost approximately $72,846, therefore Caroline's share might be approximately $36,042.03, however, Talbot County is requesting the Maryland

Environmental Service to contribute 40%, which will reduce Caroline's share to approximately $22,000. Mr. Cawl stated that the study will deal with the issue of leachate, which is extremely costly to manage and treat, as well as alternate location for septic haulers to dispose of septage. Talbot County has asked Queen Anne' and Kent Counties partner, however, their willingness to participate has not yet been determined. Following discussion, t ommissioners, on motion by Mr. Gangemi, authorized Mr. Cawley to **proceed with Caroline County's participatic in the engineering study regarding leachate and septage disposal in conjunction with Talbot County.**

Mr. Cawley and Mr. Gangemi **acknowledged that Kevin Morse, executive director, Mid-Shore Regional Counc has resigned and will be relocating in Washington State; his last day will be July 15, 2005.** Mr. Gangemi stated th the Board would be meeting later today to begin a search for his replacement as executive director.

Following presentation by Betty Ballas, administrator, Caroline County Community Service Program, t Commissioners, on motion by Mr. Gangemi, approved and President Cole signed the **Grant Acceptance, in the amou of $520, from the Department of Public Safety and Correctional Services, Division of Parole and Probation, fc supplemental grant funds to be used to purchase new equipment for the program.**

On motion by Mr. Gangemi, the Commissioners approved and **signed a Hotel Rental Tax Memorandum c Agreement with the Town of Greensboro in conjunction with the distribution and use of Hotel Rental Ta revenues** collected by the County on behalf of the Towns for the benefit of the Caroline County Economic Developmer Corporation, per the adoption of Legislative Bill #2004-4, adopted by the County Commissioners on July 13, 2004 an effective September 1, 2004, designating a five percent (5%) hotel rental tax with the County revenue generated by th tax being dedicated to countywide tourism development and promotion efforts.

Cindy Towers, risk management, **Caroline County Department of Emergency Management, accompanied b representatives from S & S Consulting, LLC, met with the Commissioners and convened the required publi informational meeting regarding the Caroline county Multi-Hazard Mitigation Plan.** A draft plan was distribute o the Commissioners for their review and the Executive Summary of the Caroline County Hazard Mitigation Plan wa viewed, as reproduced below:

> In response to continuing large-scale federal outlays of disaster funds to states and communities during the decade of the 1990's, Congress passed the Disaster Mitigation Act of 2000. Section 322 of this Act requires that all states and local jurisdictions develop and submit Mitigation Plans designed to meet the criteria set forth in 44 CFR Parts 201 and 206. The purpose of these plans is to prevent or reduce loss of life and injury and to limit future damage costs by developing methods to mitigate or eliminate damage from various hazards. Beginning in 2002, states were provided funding under this act to carry out the planning process. Adoption of the Mitigation Plan allows each local jurisdiction to remain eligible for federal mitigation funds.
>
> In January 2000, the Maryland Emergency Management Agency published the Maryland Hazard Analysis that provides an overview of various hazards, which affect the state. These hazards include winter storms, riverine flooding, storm surge, hurricanes, tornadoes, thunderstorms, epidemics, soil movement, drought, extreme heat, hazardous materials, wildfire, fire and explosions and transportation accidents.
>
> Caroline County chose to develop a Hazard Mitigation Plan meeting the above guidelines and created a Planning Committee composed of representatives from various county and municipal agencies, including Emergency Management, Planning, Health, Public Works, Economic Development, fire and Police, and Education to review information concerning the hazards that are most likely to affect the County and provide public information to citizens concerning the planning process.
>
> The Planning Committee carried out four basic tasks in assembling the Hazard Mitigation Plan. First, the committee ranked various hazards that could potentially affect the County. Second, the Committee prepared a profile of each hazard using data generated locally and data included in the Maryland Hazard Analysis. Third, the Committee reviewed the vulnerability of various critical and public facilities in the county. This included an evaluation of those facilities most at risk for flooding or storm surge due to the passage of a hurricane. Fourth, the Committee developed a list of mitigation actions that the County can take to lessen damage from each hazard. This also included preparation of a potential project listing that can be undertaken as funding becomes available.

The ten County municipalities were invited to participate in the planning process and to have their mitigation concerns made part of the County plan. By adopting the County plan each municipality will remain eligible for federal mitigation funding without having to prepare a plan of their own.

* * *

CAROLINE COUNTY
Multi-Hazard Mitigation Plan

What is Mitigation?

- Sustained actions taken to reduce or eliminate long-term risk to people and property from hazards and their effects.
- Mitigation measures help reduce:
  - The amount of damages;
  - The cost of reconstruction;
  - The amount of money and resources needed in the post-disaster period.

Disaster Mitigation Act of 2000

- Placed new emphasis on state and local mitigation planning for natural hazards.
- Established a National Pre-Disaster Mitigation Grant Program.

Grant

- The Maryland Emergency Management Agency awarded Caroline County a planning grant to complete a Multi-Hazar Mitigation Plan.
- Caroline County hire S & S Consulting.

Mitigation Planning Process

- Form Planning Committee to oversee process and provide information and comments

Three Main Plan Components

- Hazard Identification
- Risk Assessment
- Mitigation Strategies and Action Items

Hazard Identification

- Identified Hazards
- Committee Rate Hazards
- Profiled Hazards

Risk Assessment

- Identified all Critical and Public Facilities
- Inventoried Facilities based on Hazards
- Estimated Losses

Mitigation Strategies

- Identified Goals and Objectives
- Committee ranked Action Items
- Formed Potential Project Listing

Plan Review

- Planned reviewed by Planning Committee
- Submitted to MEMA and FEMA
- Approved pending adoption by other MEMA and FEMA

Final Steps in Planning Process

- Present Plan to County Officials
- Public review and comment period
- County and Municipal Adoption
- Submit to MEMA and FEMA

* * *

The plan, once approved will allow Caroline County to apply for future disaster grants. Funded through FEMA, th Mitigation Planning Grant is in its final stages, and the informational meeting is one of the final requirements for Federa approval. The draft plan was submitted to MEMA, who made some modifications; and was subsequently submitted t FEMA, who has approved the draft plan, pending adoption by the County.

Following presentation by Mr. Cawley, the Commissioners, on motion by Mr. Gangemi **approved the modifications a initialed by President Cole to the Administrative Services Agreement between Loomis Company and Carolin County for the Detention Center Medical Savings and Administration Plan, and further, on motion by Mr Gangemi, the Commissioners approved and President Cole signed the Administrative Services Agreemen between Loomis Company and Caroline County for the Detention Center Medical Savings and Administratio Plan, which establishes the terms and conditions for a managed care program for jail inmate health care, whic will commence July 1, 2005 and may be renewed after a one-year period.** Mr. Cawley explained that the proposal i n attempt to control and manage health care costs for jail inmates, as the County is responsible for providing health car to inmates while incarcerated and that further, the proposal is a trial program being proposed – Kent County is adoptin the proposal and Dorchester is considering adoption.

The Commissioners **undertook discussion of the mission/charge of the task force to study the feasibility of buildin a potential agro-civic center to be located at the 4-H and Youth Park**. The Commissioners have received names o individuals who have expressed an interest in appointment to the Caroline County Agro Civic Center Concep Committee, as a result of the public service announcement that was published in the newspaper recently. The Commissioners expressed an interest appointing a seven-member committee (six members and one chair) to determin he feasibility of the proposed project and if the concept is worthwhile for Caroline County and to determine a vision o what the facility may look like and what types of uses. Following completion of the charge of the Caroline County Agr Civil Center Concept Committee, another committee might be designed in order to address facility design. The Commissioners discussed potential resource people that might be involved and assist the committee, including, Jim Lewis and Sharon Pahlman, Cooperative Extension Service; Charles Emerson, treasurer, Caroline County 4-H Park Board, and director of Caroline County Department of Public Works; and Sue Simmons, director, Caroline County Department of Recreation and Parks. The Commissioners **instructed staff to place on the Commissioners' regularly scheduled meeting of July 5, 2005 discussion/progress on the appointment of committee members and on the Commissioners regularly scheduled meeting of July 12, 2005, discussion and designation of committee members, at which time a written scope of the project would be provided to the committee members.**

On motion by Mr. Gangemi, the Commissioners **changed their regularly scheduled day meeting of July 26, 2005 to a day meeting to convene at 9:30 a.m. rather than the previously scheduled evening meeting in order to accommodate the schedule Growth Summit**, which will be held at 7:30 p.m., at the Health and Public Services Building, Denton.

On motion by Mr. Gangemi, the Commissioners **cancelled their regularly scheduled meeting of June 28, 2005 due to anticipated absences of Mr. Cawley and Mr. Layton**. President Cole will be available to sign the weekly vouchers in the Office of Finance.

On motion by Mr. Gangemi, the Commissioners **scheduled Mr. Jim Buckland, Artesian Resources, to meet with the**

Commissioners at their regularly scheduled meeting of July 5, 2005 and instructed staff to schedule a appointment time on their agenda.

On motion by Mr. Gangemi, the Commissioners approved and signed a **letter of engagement** with Murphy & Murphy PA, LLC, to provide an **audit of the general purpose financial statements of Caroline County for the fiscal yea ended June 30, 2005**, in an amount not to exceed $45,500, in accordance with the financial reporting model in effe prior to that described in GASB Statement No 34.

Alice Birch, **resident of Denton, expressed concern to the Commissioners regarding the recent issue of th temporary moratorium on the adult oriented businesses.** Ms. Birch stated that she has traveled the County and wa amazed at the number of people that were unaware of the proposed adult entertainment bar that a Linthicur businessman, William Steiner, owner of McDoogal's East, Inc., was proposing to open at the former 19th Hole Sport Pub and Grill establishment in Caroline County. Ms. Birch expressed concern that the temporary moratorium on adu oriented businesses that the County Commissioners adopted and took effect April 29, 2005 will expire on or befor October 31, 2005 and asked the Commissioners what the citizens can do to relay the message that the citizens are agains the proposed establishment of an adult entertainment bar in Caroline County. The Commissioners explained that th temporary moratorium is a process that is part of a broad revision of codes in Caroline County. President Cole statec "This is an issue that we though Caroline County would not have to deal with."

Mr. Cawley **distributed to the Commissioners individual copies of the FY 2005-2006 Caroline County Governmen Budget Document**, which was approved by the County Commissioners at their regularly scheduled meeting of June 14 2005.

im Voss, chair, C-TEAM, inquired as to the **regional meeting with Senator Barbara Mikulski that has bee temporarily postponed regarding County-wide/regional issues related to Caroline County.** Mr. Voss stated tha when the meeting is rescheduled, he requested that the Commissioners thank Senator Mikulski, on behalf of C-TEAM d Caroline County, for the progress that has been made on the dualization of Maryland Route 404, as well a courage her to have the legislature specify the next phases of the project. Mr. Voss stated that it was his understandin that solicitation of bids was the next phase, which is Phase II, Watts Creek. Mr. Cawley stated that the Commissioner would be relaying to Senator Mikulski two priority issues for Caroline County: (1) Route 404, and (2) the North County Water and Sewer Project.

There being no further business, the meeting of the County Commissioners was **adjourned** at 11 a.m.

Vivian L. Anders
County Commissioners Deputy Clerk

August 9, 20045
Denton, Maryland

The regularly scheduled meeting of the County Commissioners of Caroline County, Maryland, **convened** at 9:30 a.m. i the Hearing Room, Courthouse, Denton.

Attending:
John W. Cole, President
Roger L. Layton, Vice President
Mario J. Gangemi, Member
Charles C. Cawley, County Administrator

The County Commissioners meeting **convened** with **prayer** led by Rev. Paul Dieter, Wesleyan Retirement Cente Denton, followed by the **Pledge of Allegiance.**

On motion by Mr. Gangemi, the **minutes** of August 2, 2005, were unanimously approved. **Vouchers** #86880 - 8700 were unanimously approved for payment.

President Cole expressed regret on the untimely passing of **Mark Grande**, director of the Caroline County Council o Arts, Inc., pianist, and for years an active community volunteer in many organizations including the Caroline Count Historical Society.

President Cole also expressed regret on the passing of **Thomas Flowers**, Dorchester County Councilmember, and senio elected official on the Eastern Shore. The Commissioners directed that a memorial contribution be sent to the family charity.

On individual motions by Mr. Gangemi, the Commissioners unanimously approved and President Cole signed the following **purchase orders:**

#38999 – Practical Trauma - $2,735.74 – thirty police trauma kits (federal law enforcement grant);
#39486 – Butterflyphoto.com - $7,418 – thirty digital cameras (federal law enforcement grant);
#39710 – GHA - $2,675.96 – two Recreation and Parks laptop computers/software packages;
#39718 – Cornerstone Productions - $4,050 - two 2005 Summerfest performances;
#39784 – Coldmaster - $1,804.33 – service and parts for detention center hvac;
#39848; #39849 – both to Hondru Fleet for $26,637.58 each for one 2006 GMC 1500 Crew Cab four-wheel drive pickup truck for Planning and Codes Administration; and one for Public Works.

On motion by Mr. Gangemi, the Commissioners unanimously approved and signed a **contingency resolution** in the amount of $4,120 for the FY 2006 Advanced Life Support, Inc. budget request.

The Commissioners issued a **2005 Summerfest proclamation** presented by Sue Simmons, director of Recreation and Parks.

On motion by Mr. Layton, the Commissioners unanimously adopted the following resolution presented by Cindy Towers, Department of Emergency Management. The Plan referenced is necessary to access certain federal grant funds, and provides a platform for joint working relationships, which Caroline municipalities have the option of becoming a part of.

RESOLUTION #2005-018

ADOPTION OF CAROLINE COUNTY MULTI-HAZARD MITIGATION PLAN

IT IS HEREBY RESOLVED BY THE COUNTY COMMISSIONERS OF CAROLINE COUNTY, MARYLAND, THAT TH TTACHED PLAN, WHICH IS INCORPORATED INTO THIS RESOLUTION BY REFERENCE, IS HEREB ROMULGATED AS THE OFFICIAL CAROLINE COUNTY MULTI-HAZARD MITIGATION PLAN.

THIS PLAN HAS BEEN FORMULATED TO COMPLY WITH ALL APPLICABLE STATE AND COUNTY REGULATIONS.

FURTHERMORE, THIS PLAN SUPERSEDES ALL PREVIOUS COUNTY PLANS.

ADOPTED/EFFECTIVE: AUGUST 9, 2005

COUNTY COMMISSIONERS OF
CAROLINE COUNTY, MARYLAND

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On motion by Mr. Layton, seconded by Mr. Gangemi, the County Commissioners unanimously **adjourned Regula Session and convened in Legislative Session** for the proposed introduction of **Legislative Bill #2005-5, Adul Oriented Businesses, Entertainment, and Material**. (See Legislative Session Minutes.)

On motion by Mr. Gangemi, seconded by Mr. Layton, the Commissioners unanimously **adjourned Legislative Sessio and reconvened in Regular Session.**

Following presentation by Billy Reep, director, St. Martin's Barn, Ridgely, and on motion by Mr. Gangemi, the Commissioners unanimously approved and signed an application to the State of Maryland for a **$50,000 FY 200 Emergency Shelter Grant**. Typically St. Martin's receives about $35,000 of the amount requested.

On motion by Mr. Gangemi, the Commissioners unanimously approved and signed a **three-year Agreement** with the State of Maryland beginning FY 2006 for a grant not to exceed $5,000 annually for **The Emergency Food Assistance Program**; and also approved and signed the required **subagreement** with St. Martin's Barn, Ridgely, which is designated in the agreements as the "Emergency Feeding Organization," or program administrator. St. Martin's Barn distributes food to about 1,000 needy people a month.

Betsey Krempasky, County planner, introduced **Kevin Clark, new deputy codes administrator**, who is working with Human Resources to develop a **job description for the new position of codes enforcement officer,** which will probably be advertised by September 1. Following discussion it was agreed that the officer should focus on the following priorities: liquor license establishments; trash dumping; licensed establishments such as sand and gravel pits and junkyards; and monitoring of Board of Zoning appeals conditions and requirements. Mr. Cawley stated that this would more than consume one person's time and the County would probably have to add another such position in the future. It was agreed that some essential characteristics of a successful applicant should be: willingness to work nights and weekends, ability to work independently with little supervision, sound judgment, ability to relate to people and be a good educator, public friendly demeanor, ability to thoroughly investigate possible violations, write up the necessary reports, and competently testify and present evidence at trial. Ms. Eigenbrode was instructed to include in the position vacancy ad that law enforcement experience is desirable. Mr. Layton will serve on the interview panel.

Following discussion initiated last week regarding the Town of Ridgely's July 19 letter, the Commissioners, on motion by Mr. Layton, unanimously selected Option #2 as set forth in the letter. **Option #2** obligates the County to pay the entire portion of the **Bell Street sewer pumping station upgrade**, estimated at $207,500. The County will still have to file the appropriate **Midshore Business and Technology Park** site plans with the Ridgely Planning Commission at an estimated filing and review fee of $5,000. In return, the Town will: 1) abate all water/sewer system development and connection fees for the first phase (40 EDU's) of the Midshore Business and Technology Park; 2) cover costs incurred by Town engineers in reviewing pumping station plans. Option #2 will save about $146,125/approximately 41% of initial costs. Mr. Cawley stated that it is important to enable this 20-year project to unfold correctly and this is an

important step. The Town of Ridgely will be informed in writing of the Commissioners' decision, with appreciatic expressed for the Town's spirit of partnership.

On motion by Mr. Layton, the Commissioners confirmed appointment of the following persons to the ad hoc **Carolir ounty Agro Civic Center Concept Committee**: Blair Carmean; Sara Jane Davidson; Jim Lewis, Directo Cooperative Extension; Margaret R. Myers; David Nagel; Bryan Saathoff; and David Whaley. The Commissioner approved and President Cole signed the following appointment letters:

*The County Commissioners are pleased to appoint you to the **ad hoc Caroline County Agro Civic Center Concept Committee.***

As you probably aware, the Commissioners are interested in pursuing development of the Caroline County 4-H and Youth Park on Detour Road, south of Denton, into a larger, more up-to-date facility with widespread appeal.

We do not wish to proceed without first obtaining citizen input into the vision for a new County asset, hence our creation of this Committee.

Our current Park facility on Detour Road south of Denton is underutilized, needs significant renovation, and has limited potential in terms of the attractions it is able to host and the revenue it is able to produce. Our concept is not to redesign the existing structure, but to construct an entirely new, modern facility on vacant Park acreage, while retaining the current structures.

Therefore, the Committee's charge is to respond with a written report on the following questions:

1) *In the forthcoming twenty years, what new activities and events, competitions, and programs could a new civic center potentially accommodate in order to provide a better quality of life for residents, and to promote the type and level of tourism that would not detract from residents' quality of life?*

The Committee should consider not only sports, but music, dance and other artistic endeavors, adequate space for which is currently lacking in the county. Generally speaking, modern facilities now have the ability to be quickly converted for various activities, and that is the kind of structure we are interested in. Therefore, we are requesting a comprehensive list.

2) *What type and size of structure would accommodate these needs? Think in terms of a resident population of 50,000 people, or almost double the county's current population. In order to properly address this question, it will be necessary to survey existing facilities in the county (schools, public libraries, etc.) in terms of their capacity.*

3) *What activities are least desirable in terms of priority, and what activities do you feel to be inappropriate or undesirable?*

Please note that the Committee's charge <u>does not</u> include design or cost estimation, which will be handled by others in subsequent phases of this project should the Commissioners decide to proceed.

However, a critical part of the Committee's information gathering will consist of taking field trips to the best examples of such public facilities in the Delmarva area, and conveying your impressions to us. Please take the time to interview the facility manager and other appropriate staff regarding the general functionality and public impression of the facilities in terms of how they are asked to perform, and note any comments they may have.

Include in your report a list of the name and location of all sites visited, the name and title of those interviewed, and the interview results, along with a copy of the facility's literature.

A County van will be provided for these trips. Van reservations should be coordinated in advance with the Caroline County Department of Public Works (Tel: 410.479.0520). The County will reimburse tolls and reasonable meal expenditures if receipts are submitted to the County Finance Office.

The Committee is to designate its own chair. Since the Committee is subject to the State Open Meetings Law, it must notify the Times Record newspaper of its meeting dates, times and locations, allow the public to observe its meetings, and take brief minutes.

The Caroline County Cooperative Extension Office will provide clerical assistance, courtesy of Jim Lewis, Director. County department heads may be assigned to assist this committee.

The County Commissioners look forward to receiving the Committee's written report by December 1, 2005.

Contact Charles Cawley, County administrator, if questions arise in the interim.

On behalf of the County Commissioners, please accept our sincere gratitude for your willingness to help us explore an exciting new entertainment and cultural venue for all Caroline Countians.

The Commissioners, County Administrator and Jim Lewis, Planning Commission member, discussed a **Planning Commission hearing** scheduled for next week regarding **proposed amendments on transfer of development rights and development density**. Mr. Cawley indicated that he understands the rationale behind the proposed amendment but is not sure they are the most effective means to the desired end, and particularly noted that they are not in conformance with the draft county strategic plan. He and Mr. Lewis agreed that if the County would accept shared sewage systems, developers could more easily give people the quarter acre lots and natural communal vistas that they want. However, a water and sewer district would be required.

Mr. Cawley encouraged the Commissioners to make sure they are thoroughly familiar with the **draft County strategic plan** since they will be asked to adopt it before year's end.

There being no further business, on motion by Mr. Layton, duly seconded, the meeting was adjourned.

Leigh Sands
Executive Assistant