

(Part of Region J)

(Legend to accompany
Chatham County Map)

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GEOLOGY AND LAND USE

CHATHAM COUNTY

by

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This report is preliminary and has not been edited or reviewed for conformity with North Carolina Geological Survey standards and nomenclature.

A geologic map is the basic foundation upon which many land use and land management decisions should be made. Geologic knowledge as a basic tool for land use planning has always been a necessity; many times, an overlooked necessity. The rapid increase in population and the transition of our structure from one of the predominantly agrarian society to one of complex interrelationships of manufacturing and technical services has overtaxed our resource evaluation and planning capacity to keep abreast with our growth. We find, therefore, that we have become the victims of virtually unplanned development. Many times, the wants of a few have taken precedence over the needs of many.

It is now becoming apparent, that in order to just supply the ever increasing demand on our non-renewable mineral resources, all future planning must include basic geologic data and must insure the protection of our active and potential mineral resource sites for our present and future generations.

Because of accelerated growth, much planning is done after development rather than during the conceptual planning and development period. Consequently, the hasty development of many urban communities has left us in the unfavorable situation of trying to provide the needed resources these expanding areas demand while unplanned growth patterns have seriously abused our land and have not made the fullest and most productive use of our natural and mineral resources.

In addition to providing the planners with the distribution of the geologic rock types and the locations of inactive, active, and potential mineral resource sites, many solutions to land use

planning and engineering problems which arise with urbanization can be solved through careful study of the information present on the geologic map. The following lists the types of information that may be assimilated from a geologic map:

- A. Bedrock geology describing rock type and their distribution
- B. Active, inactive and potential mineral resource sites
- C. Topography of the area showing unique topographic features
- D. Drainage systems and basins
- E. Floodplains
- F. Flood prone areas
- G. Terraces - alluvial and marine
- H. Areas susceptible to extreme erosion
- I. Landslide prone areas
- J. Slope design for highway and industrial sites
- K. Cut and fill sites
- L. Surface and subsurface data on the design and construction of public and private industrial projects
- M. Dam site locations
- N. Fault and shear zones which may be of significance in the location of dams, industrial sites, etc.
- O. Location of solid and liquid waste disposal sites
- P. Water well location sites to supply ground water to areas without municipal facilities
- Q. Green belt locations
- R. Recreational sites (parks, etc.)

S. Future location sites for bicycle and other trails

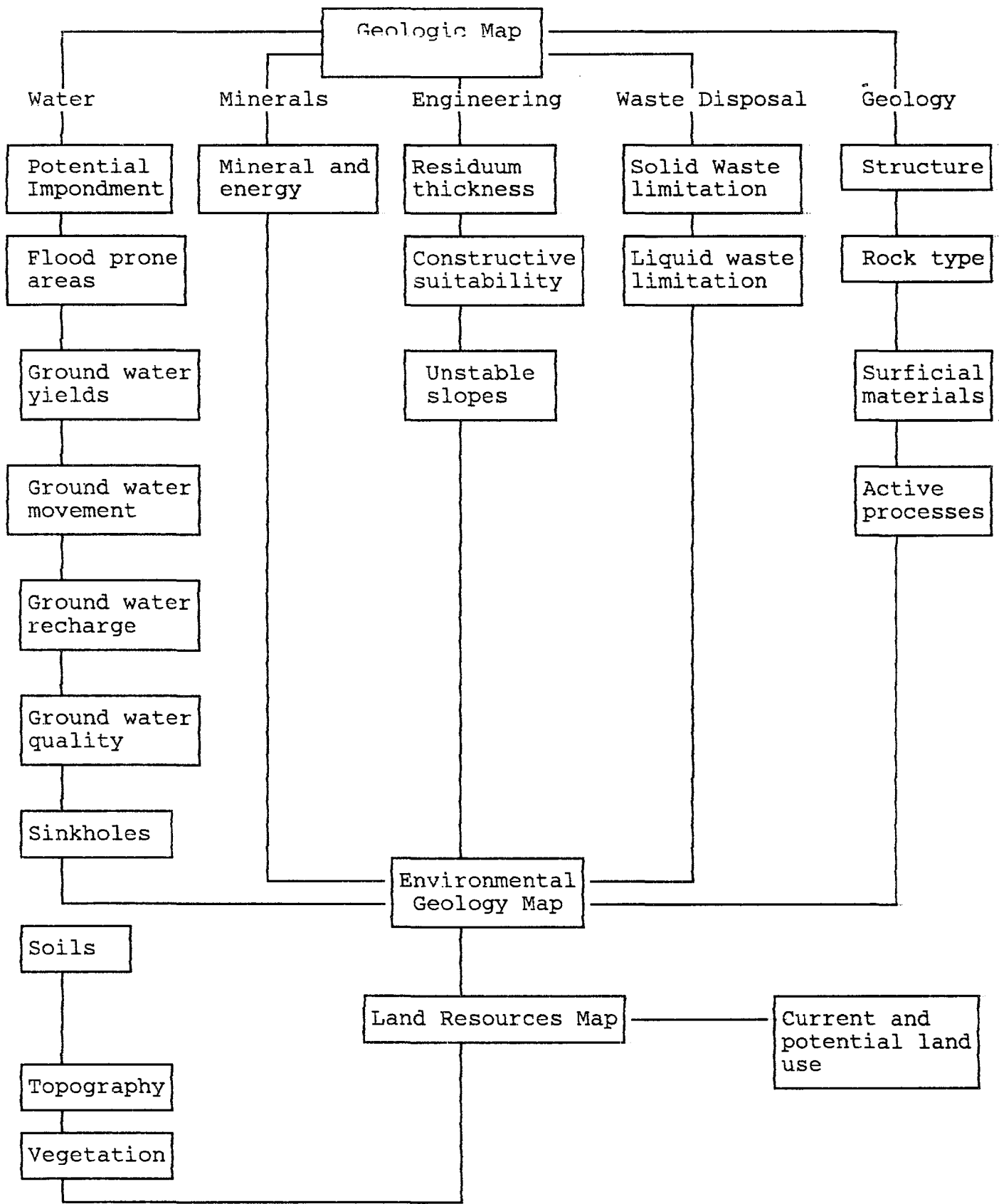
This information will save valuable time and money as new areas are planned for and incorporation into the evergrowing urban framework.

The urban area that does not project its long-ranged planning program for its existing and its potential mineral resource sites will have to bear the consequences of either added financial burden of higher transportation costs from distant source areas or of higher cost substitutes which may be in limited supply. So, it is imperative that city and county land use planners should, for present and future use, acquire from the geologists all available geological and mineral resource information on their area. This information is essential in order to make the most advantageous use possible of the strategically located supplies and deposits of raw rock and mineral resources within an area.

GEOLOGIC MAP UNITS, CORRELATED WITH THEIR GENERAL ROCK TYPES, TOPOGRAPHY AND USES

GEOLOGIC UNIT	ROCK UNIT	TOPOGRAPHY	USES
Floodplain Alluvium	Unconsolidated sands and clays	Narrow to broad lowlands	Construction sand; brick clay (selected locations); ceramic clay (selected locations)
River terrace and Coastal Plain deposits	Unconsolidated clays, silt, sands and some gavel, often interlayered	Flat to moderately sloping divides; gentle to moderate slopes	Construction sand; decorative gravel (landscaping, etc.)
Coastal Plain sediments	Loose sand; some gravel terraces	Flat top divides and gentle to moderate slopes	Construction sand, decorative gravel (landscaping, etc.); ceramic clays (selected locations)
Triassic sediments	Red shales with interbedded sandstones, siltstones and claystones	Low rolling hills, undulating gentle to steeply sloping hills and ridges	Brick and tile clay; ceramic clays (selected locations)
	Red to white consolidated gravels (conglomerate)		
Triassic dikes, sills and mafic igneous complexes	Dark colored massive crystalline rocks	Rounded hills; slightly to steeply sloping to broad low lands	Construction - crushed stone (highway base aggregate)
Felsic igneous complexes	Light colored massive and granitic texture	Rolling dissected hills; slight to moderate slopes	Construction - crushed stone (highway base aggregate)
Flows, graywackes, lithic and crystal tuffs and conglomerates	Hard metamorphic rocks	Steep hills and rough stoney ground	Construction - crushed stone (highway base aggregate)
Argillite, tuffs, Phyllites	Soft metamorphic rocks - exhibits laminations and banding	Rolling hills and lowlands	Construction - light-weight aggregate
Schists and schistose gneiss	Mica-bearing metamorphic rocks - exhibits laminations and banding	Rolling dissected hills	Construction - crushed stone (highway base aggregate)

TABLE 8: DERIVATIVE GEOLOGIC MAP POSSIBILITIES

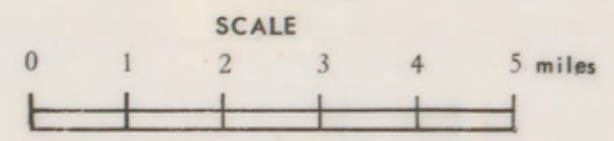
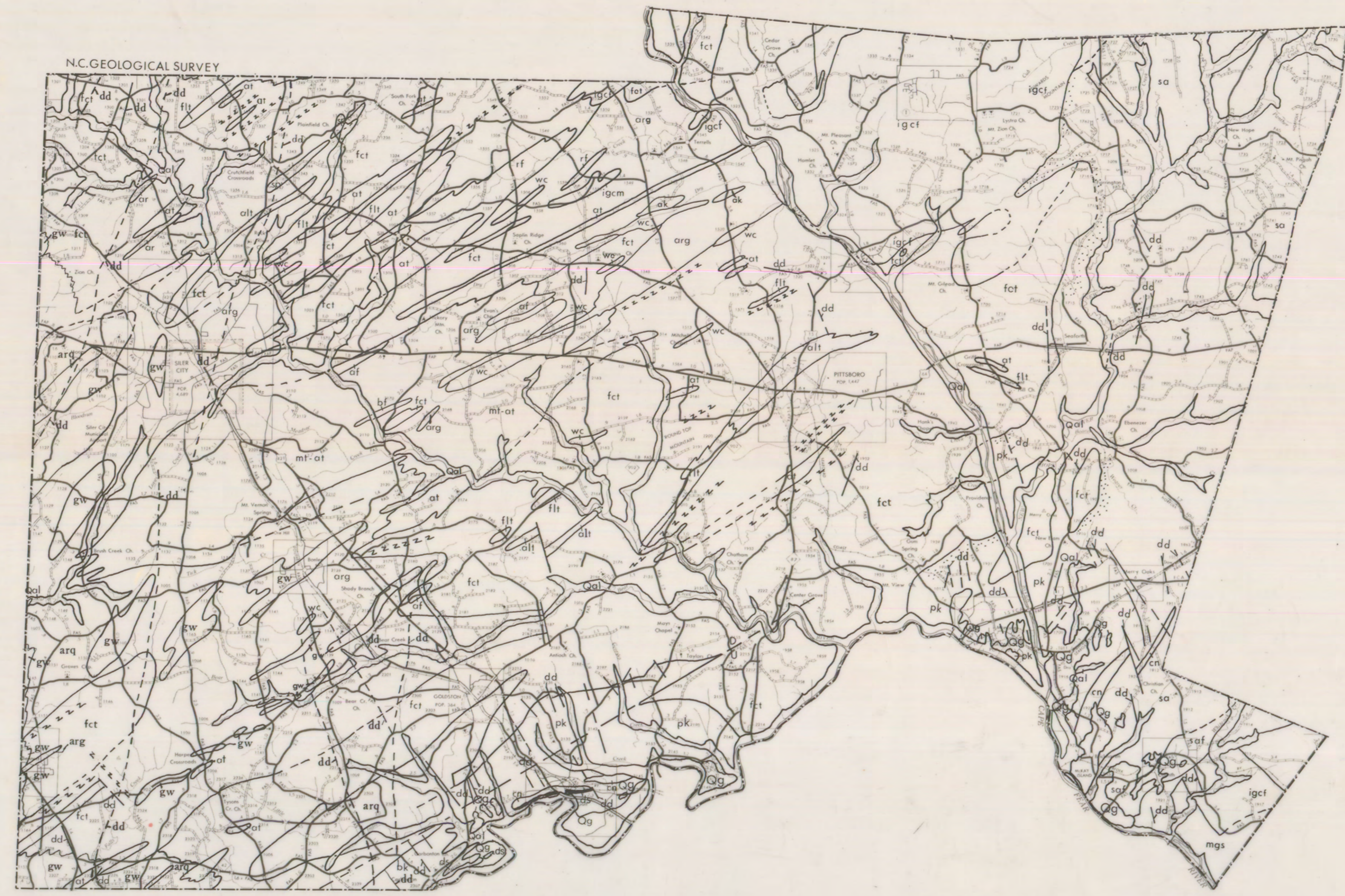
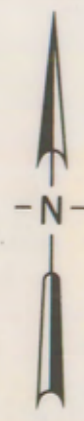


CONCLUSION

For intelligent resource management and land use planning, as much useful information as possible on the area should be obtained before any decisions are made and any plans or programs initiated. Without the basic geologic and mineral resource knowledge and understanding of an area, sound resource management and land use planning cannot and will not be implemented.

In order to plan properly, the basic information provided in this text should be used as a supplement to other information acquired for these purposes. Without wise and careful use of all the knowledge available, we become the victims of unplanned growth and of shortages of critical mineral resources, rather than the residents of well-planned communities.

Planned growth patterns primarily depend on the availability of suitable land and mineral and natural resources for development and continued support. Present and future land use planning and mineral resource evaluation and development depends upon our ability to work in close cooperation with one another and to use our combined knowledge to its wisest advantage. These facts are becoming more critical to us daily as we realize that we have the knowledge to plan land use but are beginning to lack many of the critical nonrenewable mineral resources needed to sustain our progress. This very fact places the burden of responsibility upon us to help insure the wise conservation and expanded exploration of mineral and energy resources.



LEGEND

IGNEOUS ROCKS		METASEDIMENTARY AND METAVOLCANIC ROCKS		
Mesozoic Triassic			Includes novaculite, graywacke and some wacke conglomerate	
	diabase dike, dd; diabase sill, ds			
	Pre-Cambrian to Paleozoic Pre-Cambrian to Middle Paleozoic			
		felsic igneous complex		
mafic igneous complex				
ultramafic rocks				
SEDIMENTARY ROCKS				
Mesozoic to Cenozoic Cenozoic to Geologic				
	Floodplain alluvium			
	Gravel deposit (alluvial)			
	Coastal Plain sands and clays, unconsolidated			
Mesozoic Triassic				
	Gravel deposits (marine?)			
	Limestone sediment			
	Sanford Formation, fanglomerate			
	Sanford Formation			
	Cumock Formation			
	Pekin Formation			
SYMBOLS				
Contact				
Dashed where approximately located; dotted where concealed by Coastal Plain sediments				
Gradational contact				
Shear zone				
Anticline				
Syncline				
Fault				
Dashed where approximately located; U, upstream side; D, downstream side				

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