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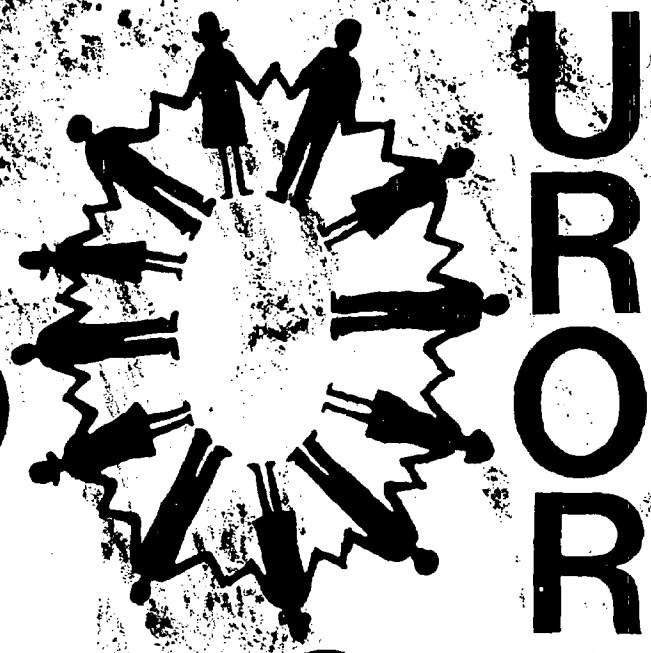

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Alternative Growth Patterns

Technical Report Five:

Aurora Land Use Plan

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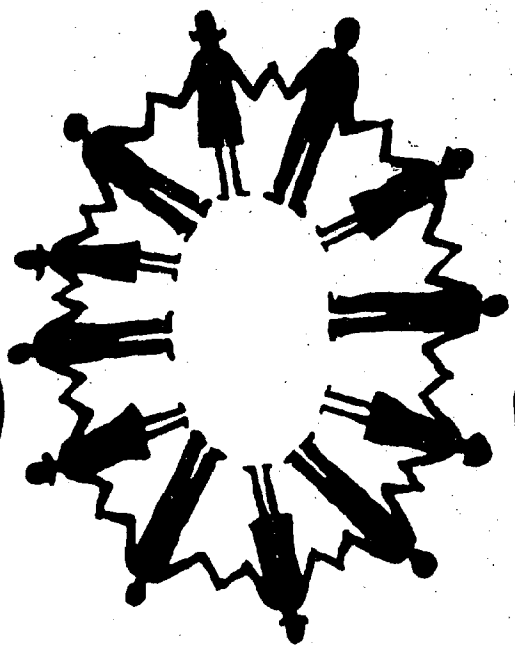

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Alternative Growth Patterns

Technical Report Five:

Aurora Land Use Plan

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A U R O R A

Alternative Growth Patterns

Technical Report Five: Aurora Land Use Plan

This fifth report of Aurora: Alternative Growth Patterns is the Aurora Land Use Plan prepared in compliance with and under the guidelines of the North Carolina Coastal Area Management Act of 1974. The primary purpose of this plan is the identification and analysis of major land use issues which the town will face in the next ten years, the development of land use goals, objectives and criteria for dealing with those issues and alternative approaches to the management of the growth which is projected to occur in the Aurora area.

AURORA TOWN BOARD:
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Joseph Galloway
Joe Lee Hollowell
Malcolm P. Rowe

This report was published by the School of Design, North Carolina State University. Funded by Coastal Plains Regional Commission Grant number T/514/4230-00/41-00/253-01.
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THE LAND USE PLAN

SECTION I: STATEMENT OF LOCAL LAND USE ISSUES, GOALS AND OBJECTIVES

Local land use issues, goals and objectives have been addressed in the publication, "Aurora, Alternative Growth Patterns, Technical Report 3: Goals for Aurora." Refer to this report, which has been included as Appendix I, for a full and descriptive explanation of these issues, goals and objectives.

SECTION II: SUMMARY OF DATA COLLECTION AND ANALYSIS

1. Present Conditions

A. Population and Economy

(1) General description

- population--671
- location--along the Pamlico River in southeastern Beaufort County, 28 miles southeast of Washington, the county seat, and 130 miles east of Raleigh.
- climate--temperate with mild winters and summers and an average annual rainfall of 52.5".
- topography--relatively flat, ranging from sea level to 15' above sea level.
- government--mayor and four commissioners.
- taxes--expressed as 100% of appraised value, the town and county tax rate is $0.62 per $100.

(2) Existing industry

- agriculture--Historically, Beaufort County's most significant economic activity has been agriculture. In Beaufort County in

1970, there were approximately 1650 farms with 158,950 acres of land under cultivation.

Since 1940 agricultural employment has declined, supporting the contention that rapid advance in farming technology is decreasing the farm labor force. New machinery and methodologies have produced a situation in which the small farm can no longer be operated competitively. In addition, this is indicative of a trend toward greater vitality and potential for expanding production through the consolidation of farms. Sufficient evidence reveals that farming is gradually becoming big business within the county.

- forestry--A major portion of Beaufort County, including the area around Aurora, is forested. Therefore, forest resources represent a major user of land which has a significant potential for future expansion and growth as the demand for this natural resource increases. Even though at present, the annual growth of all timber species exceeds the annual cut, forestry predictions show that by the year 2000 the demand for wood and wood products will be more than double the present demand. The future timber needs will be met only by intensive and extensive use of proper forest management practices, which, among other things, takes into consideration the preservation of wildlife habitats and the importance of hardwood species to these habitats. Of the county's 531,840 acres, 353,865 acres of land are timberland. 52% of this timberland is owned by private companies with the dominant forest type being loblolly pine.
- manufacturing--Although Beaufort County's economy has tradition-

ally been oriented toward agriculture and forestry, manufacturing has emerged in recent years as the county's main source of new employment. In addition, manufacturing has brought new money into the county's economy.

Although some manufacturing industry is located in various places throughout the county, the majority of firms and employment are located in the Washington area. Other firms located in the eastern part of the county are there in order to be near their source of raw materials. However, it is expected that the major portion of any expansion in manufacturing employment will occur in the Washington area.

- phosphate industry--The phosphate industry is one of Beaufort County's newest additions to its economy. The existence of phosphate reserves was revealed in the late 1950's and consequently Texasgulf, Inc. began mining in 1965 near Aurora. The size of the reserves indicates it is the third largest in the world with an estimated 10 billion tons of phosphate ore in Beaufort County.

  Texasgulf, Inc. currently employs over 1000 workers and has plans to expand to 1500 workers by 1980. North Carolina Phosphate Company expects to begin construction in late 1977 with initial production projected to begin in July, 1978. It is estimated that peak construction employment will be 800 workers. Operation of the mine and plant should begin sometime in late 1978 with approximately 468 production employees when full capacity is reached.

- fishing--Fishing is a more significant economic activity for

the Belhaven and Aurora areas than for other parts of Beaufort County. Seafood industries predominantly provide only seasonal employment for the area's unskilled female labor. Some economists think fishing will always play a significant role in Beaufort County's economy as it has in the past. The seafood industry is expected to expand in the future to meet the demand placed upon it. They predict that with proper guidance and technology, commercial fishing could result in a million dollar industry in the near future.

Currently, the crab factory in Aurora employs about 40 workers and two seafood packing houses in South Creek employ a total of about 30 people.

(3) Commercial analysis

The existing commercial facilities in Aurora can be expected to serve the basic daily needs of in-town residents. Aurora can perhaps also be expected to capture some additional trade from the township area if its range of goods and services expands to meet rudimentary needs of the people. Further, the work-day population of the township is substantially more than the resident population. More outsiders probably would develop a stronger tendency to visit the town and utilize its commercial district if recreational opportunities were enhanced at Aurora, especially water-related activities.

Aurora operates under two major forces, in terms of its trade area. First, the population is small (even if it grows to 1200 people); therefore, the range of services it can provide is limited. Second, Aurora is commercially isolated because no major competition

for commercial trade exists within thirty miles. However, Aurora presently supports several businesses beyond what is generally assumed to be the maximum capacity for a town its size, including a furniture store, six beauty shops, an auto parts store, five gas stations, three hardware stores, two grocery stores, and three clothing stores. Thus, Aurora, in some respects, functions beyond the commercial capacity which would be considered appropriate for small towns of a similar size. On the other hand, Aurora lacks some basic stores, notably a drugstore, a barber shop, and a repair shop. Minimizing initial and long-term cost to the community should always be an important factor in the locational decision of any commercial venture. Therefore, any new commercial activity should first consider locating in the existing downtown-commercial area to determine if the necessary amount of land and facilities are available. Ample vacant store-fronts exist to house new commercial activity, increasing viability of many businesses by reducing necessary initial investment. Over-all, the projected population picture makes some commercial growth appear possible for Aurora. At the very least, existing merchants should consider expanding their stock and diversifying the range of goods they offer to serve the non-mobile sectors of the population as completely as possible. The addition of needed goods or services should increase demand and result in healthier businesses.

Finally, some leisure-oriented commerce might develop in Aurora: boat sales or rentals, lodgings, a tavern or another restaurant, a drive-in or a small theater. Some of these would orient primarily

to outside, tourists-type trade coming from the ferry across the Pamlico River, from mine tours, or from second home owners. Other ventures would help fill local recreational needs and could expect regular community patronage as well as occasional outside usage.

B. Existing Land Use

- Refer to the enclosed Existing Land Use Map.
- Refer to Appendix I for an evaluation of land use compatibility problems and problems resulting from unplanned development.

C. Current Plans, Policies, and Regulations

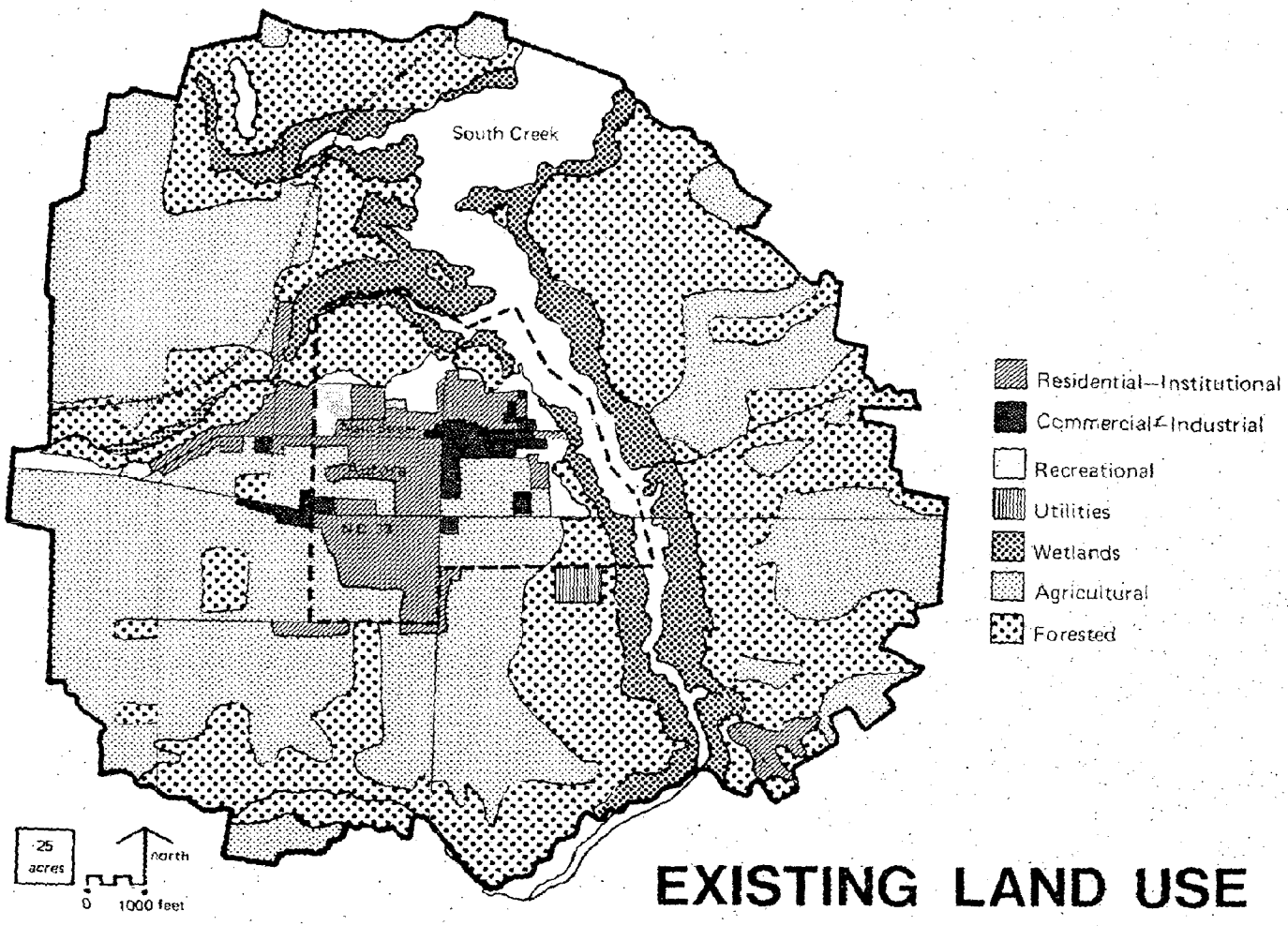
(1) Plans and policies

- transportation plans--(From the Land Development Plan, 1968) For the future development of Aurora an extensive Thoroughfare Plan is not advocated. Existing and expected traffic volumes do not warrant any elaborate circulation system, and the present primary facilities, namely N.C. 33, Main Street, and Watson Road should continue to satisfy the major transportation needs.

  Recommendations in the 1968 Land Development Plan include paving and other necessary improvements to existing streets and adding local and minor residential streets and access roads. At the present time the State has no transportation plans for this area.

- community facilities plans

  --A recreation, snack bar, and rest room facility which is part



EXISTING LAND USE

of a recreation master plan, has just been completed.

--An $800,000 addition to the existing high school is under construction.

--A Resource Conservation and Development dike is proposed for Aurora.

--An on-going residential street paving program utilizing revenue sharing funds is carried out as funds permit.

--A marina and pier development plan proposed for the end of Main Street is in the preliminary design stage.

--The "Community Facilities Plan and Public Improvements Program for Aurora, N.C." was completed in January of 1968.

--A $420,000 HUD grant has just been awarded Aurora to construct a community center, extend water and sewer, pave existing streets and rehabilitate 30 sub-standard homes.

- <u>utilities extension policies</u>--The sewer hook-up policy applies to all domestic sewer service customers and to all commercial and industrial sewer service customers with a waste output comparable to domestic sewage output. Customers with waste requiring special treatment will be billed in accordance with the town's cost for additional treatment. Individual sewer service mains will be provided and maintained by the town to customers' property lines. Sewer service will be provided to domestic customers with private water wells for a period not to exceed one year. Sewer service will be provided to commercial and industrial customers with private wells only as individually approved by the Board of Commissioners after determination is made of the volume and strength of waste to be discharged into the system.

The water hook-up policy applies to all domestic, commercial and industrial water service customers. Each single family dwelling or residence and each business establishment or industrial facility shall be on a separate meter. Water service will be made available to the property line only. Meters shall be located along the property line and shall be readily accessible to the meter readers at all times.

All water and sewer services located outside of the town limits will be billed at double the standard rate, and all tapping fees will be doubled.

- open space and recreation policies--The town owns a small piece of land at the east end of Main Street which contains a pier and a concrete boat ramp. There are at least two vacant lots in town which are being maintained by the town as public open spaces even though they are privately owned. A 25-acre tract of land between Snowden Elementary School and the Aurora High School, owned by Texasgulf, has been developed as a recreation facility and leased to the Board of Education. It includes two lighted, paved tennis courts, a lighted football field and stadium, a running track, and lighted baseball field, and other open play areas. A 1½ acre public park developed by Texasgulf is located at the west end of Main Street where it intersects N.C. 33.
- Prior land use plans and policies--In 1967 a major planning study, and subsequent plans and programs, was conducted through the Department of Conservation and Development--Division of Community Planning. The "Land Development Plan" was published

in November of 1967 and the "Community Facilities Plan and Public Improvements Program," was published in January of 1968.

(2) Local Regulations

- An ordinance providing for the zoning of the town of Aurora, North Carolina. The Building Inspector is authorized and assumes the duty of enforcing the provisions of this ordinance. Appeals may be made to the Board of Adjustment. A new zoning ordinance based on this land use plan, and which will include the one-mile extraterritorial area, will be drafted.
- Supplementary regulation of mobile home and travel trailer parks and related facilities for Aurora, North Carolina. This ordinance regulates lot sizes, site placement, and other requirements incumbent upon mobile homes and travel trailers and related facilities. It is enforced by the Building Inspector.
- Street improvement policy. This policy provides for the improvement of streets and sidewalks in Aurora. The Town Commissioners are authorized to make street improvements and assess cost to property owners.
- Code of General Ordinances, Chapter G, Article I, Section I--Property Kept Clean. This article requires all property owners to keep their property in a sanitary condition and owners of unoccupied buildings to keep such buildings in a sanitary condition and fastened against unlawful entry. This article is enforced through written notice to the owner by the Police Chief or Town Clerk.
- Chapter G, Article II, Section I. Garbage Required to be Promptly Removed. This article is enforced through the Mayor and carried out by the Police Chief.

- Chapter G, Article III, Section I. Privies Regulated. This article prohibits the location of privies within fifty feet of any public street or sidewalk in Aurora. Enforcement is through the Mayor and is carried out by the Police Chief.
- Chapter G, Article IV, Section I. Hog Pens. This article stipulates the number of hogs allowed per square feet and the distances such lots must be placed from occupied dwellings. This ordinance is enforced by the Mayor and carried out by the Police Chief.
- Chapter J, Article I, Section II. Building Permit Required. This article requires that all structures to be built inside the corporate limits be certified by the Building Inspector as to plans, purpose of structure, cost and location before a permit can be issued. This ordinance is enforced by the Building Inspector who possesses all the powers conferred and performs all duties prescribed by G.S. 160-117 and other applicable statutes.
- Chapter J, Article I, Section IV. National Building Code Adopted. This article adopts the North Carolina State Building Code, 1958 edition, and the "Uniform Residential Building Code" as the official building code of the Town of Aurora. It is enforced by the Building Inspector.
- Septic tank regulations. The county enforces regulations which parallel the state regulations regarding the installation of septic tanks and minimum lot size requirements.

(3) Federal and State Regulations

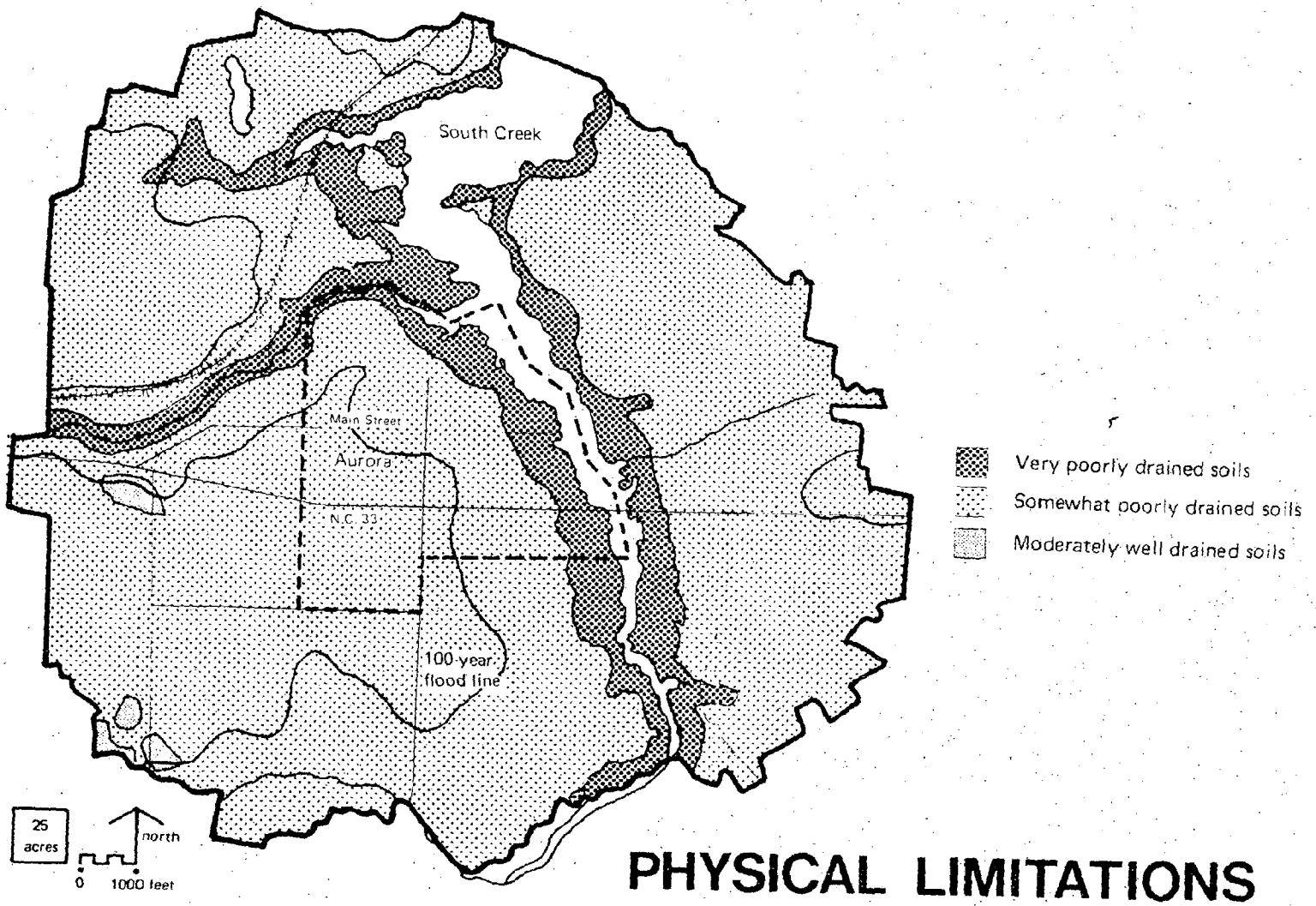
(Refer to Federal and State Land Use regulations provided by the Department of Natural and Economic Resources.)

2. Constraints

A. Land Potential

(1) Physical limitations (Refer to Physical Limitations Map for hazard areas, areas with soil limitations, and the 100-year flood prone area. No steep slopes exist in this planning area and are therefore not mapped.)

- Sources of water supply--The study area of Richland Township lies within the Coastal Plain of North Carolina where the terrain is generally flat to rolling, with an overall slope to the southeast. The drainage pattern in the area is essentially dendritic with most tributaries originating in the large swampy areas. The interstream areas, though topographically high relative to the adjacent drainages, show poor circulation of water. As the water table reservoir remains near the surface and nearly full, during periods of heavy rainfall these areas are largely flooded. The rainfall, averaging 45-50 inches in one year, is then mostly rejected as overland run-off to the streams. Stream flows are substantial and during periods of low or strong winds, are affected by tides. The quality of surface water is poor. In addition, the Coastal Plain of North Carolina is underlain by a "wedge" of stratified sedimentary rocks which, from a thin veneer along the western boundary of the area, thicken seaward to about 10,000 feet at Cape Hatteras. These sedimentary rocks have been divided into geologic formations or stratigraphic units which range in age from recent to early cretaceous or possibly older. In general, the units have a NE strike and dip southeastward at a gradient of about 20 ft/mile. They gradually change



PHYSICAL LIMITATIONS

in lithologic character, with the hydraulic conductivity decreasing from west to east. All the sediments between the crystaline basement rocks and the water table are saturated with water, are interconnected, and form one continuous ground water reservoir.

A brief description of the hydrologic character of the various formations follows:

--The Water Table Aquifer, consisting of post-miocene deposits, covers the entire area. In it, the ground water occurs under unconfined conditions with the water level ranging from land surface in the swamps to a depth of more than 15 feet along the sandy ridges bordering the Pamlico and Neuse Rivers. At an average depth of 20 feet, the base of this aquifer is in most cases a clay layer which is discontinuous in the western part leaving the aquifer in direct contact with the Beaufort or Castle Hayne formations. Yields of the wells tapping the aquifer are less than 10 gpm; its water is replenished by infiltration from rainfall.

--The Yorktown formation is separated from the water table aquifer by relatively impermeable layers of silt and clay, the water occurring under confined or semi-confined conditions. Wells tapping it may yield up to 250 gpm (gallons per minute).

--The Pungo River formation contains inter-bedded phosphatic and montmorillonite clays. This formation does not crop out at the surface and has poor water bearing properties. But, while primarily an aquitard, wells yielding adequate quantities of water for domestic supplies can be developed from permeable

zones at many localities. The formation contains phosphorites in an area of about 1000 miles.

--The Castle Hayne formation extends along nearly the entire coast of North Carolina, thickening and deepening eastward at the rate of 10 feet/mile. In the western part, the confining beds are discontinuous. The Castle Hayne can be divided into two zones, the upper being the more permeable and the most important aquifer of the area. The Castle Hayne formation is absent of wells in the extreme western part of Beaufort County, yet yields from 8 inch wells tapping it elsewhere range up to 300 gpm, and 1000 gpm or more can be developed in favorable locations. The lower horizon grades into a confining glauconite silty clay and water at depths greater than 300 ft. below mean sea level are generally brackish or saline.

--The Beaufort formation has no known outcrop area. While the formation has relatively good porosity and permeability, the least permeable part is generally the upper. In the western and central part of the area, the formation is a fresh water aquifer, while a sample of water 470 feet below mean sea level at the Lee Creek mine site had a chloride content of 3000 ppm. (U.S. Public Health standards for drinking water limit a maximum of 250 ppm. chloride without treatment.)

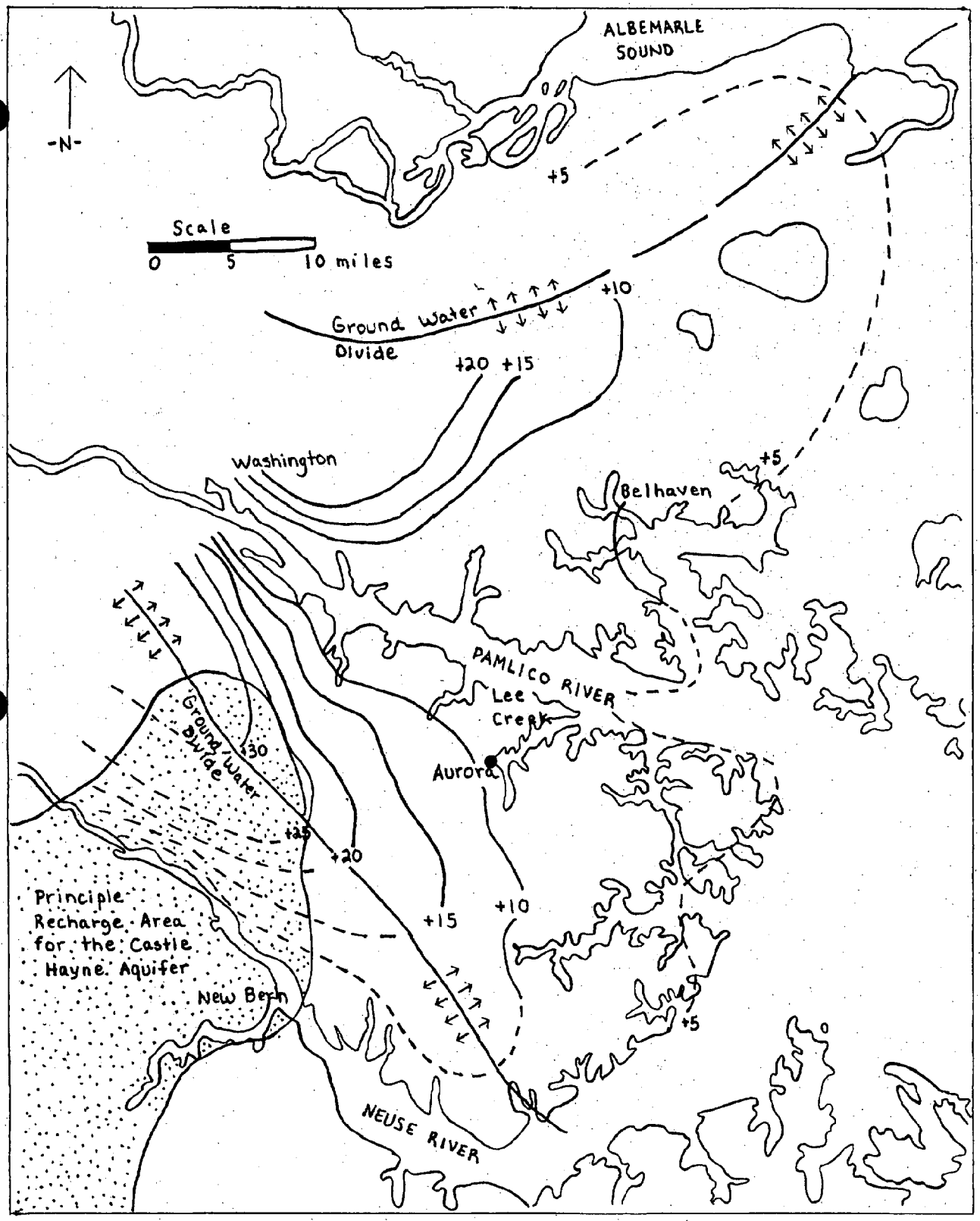
--The Peedee, Black Creek, and Tuscaloose formations are tapped by wells west of Beaufort County. Although these formations may not be important for the formation of fresh ground water supplies, their hydrologic character can be important in the study of upward leakage into the overlying strata.

Water use in Richland Township is largely restricted to ground water sources. The Upper Castle Hayne aquifer is the principle source of water supply in the area because of the productivity of the aquifer, the quality of the water, and the simplicity of well construction. At certain localities, however, even the relatively pure waters of the Castle Hayne have objectionable amounts of iron, hydrogen sulfide or hardness-causing minerals.

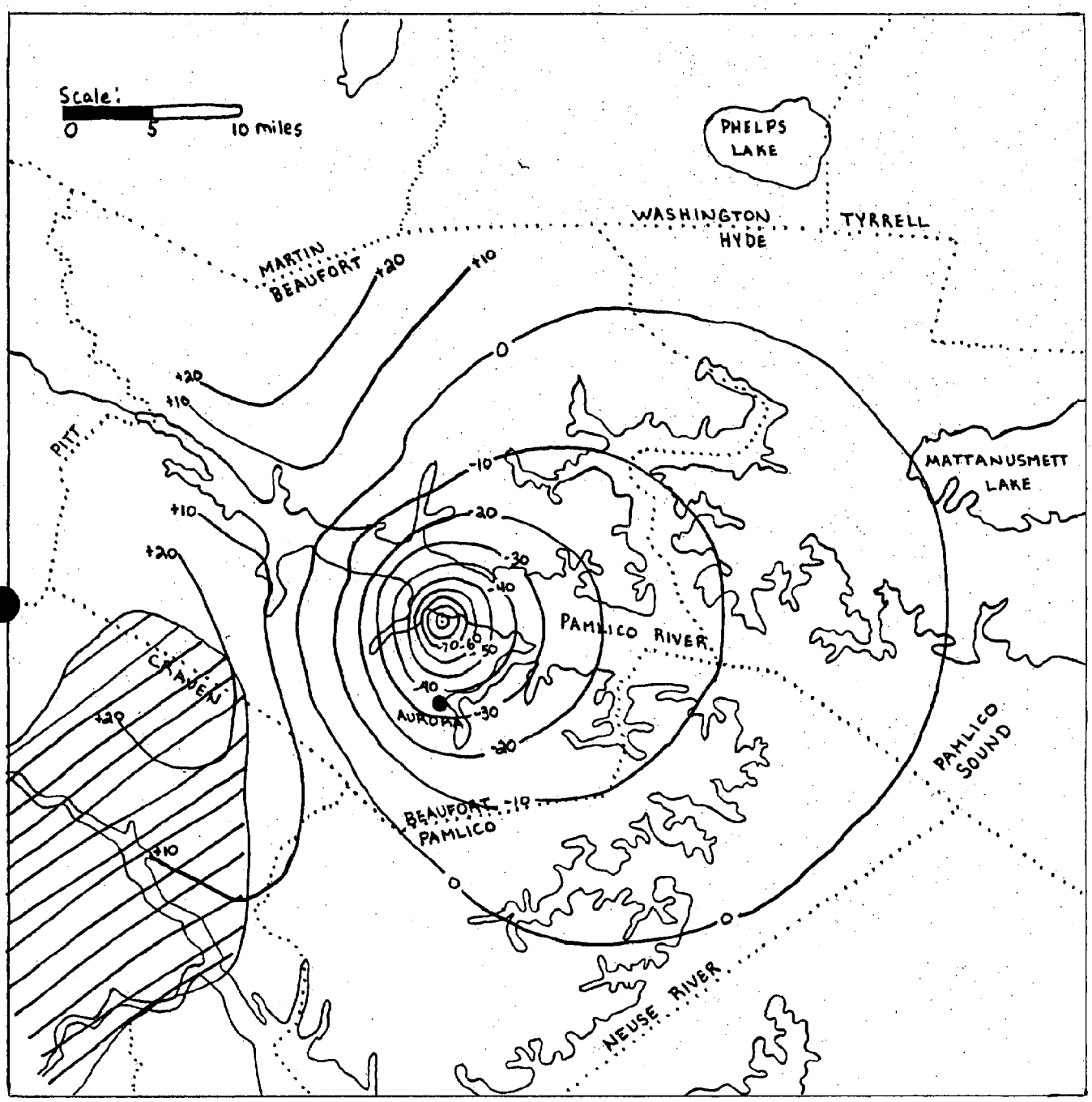
A complete census of all wells in the area has not been made. However, the estimated total withdrawal from the aquifer system in 1970 for all purposes except irrigation was about 55 mgd (million gallons per day). Texasgulf and N.C. Phosphate were recently granted permits by the Environmental Management Commission to pump out a total of 102 mgd from the aquifer system (35 mgd for N.C. Phosphate Corp. and 67 mgd for Texasgulf, Inc.). The full potential of existing irrigation wells is about 20 mgd, though the use of water for irrigation varies from year to year, in some years none being necessary. Most of the wells in the area are domestic wells that generally penetrate only the upper few feet of the aquifer system. The municipal well for the town of Aurora extends to a depth of 340' into the Beaufort formation.

With the exception of the water table aquifer and those unconfined western areas of the underlying formations, water in the various units exists under artesian pressure. While the water levels in water table wells respond rapidly to variable recharge rates caused by the infiltration of precipitation, those in artesian wells show less fluctuation under similar conditions.

Prior to the start of pumping at the Lee Creek mine, the piezometric surfaces (the level to which water will rise naturally in a well) of all the hydrogeologic units in Beaufort County were probably everywhere above sea level. However, actual data concerning water levels before the beginning of pumping is quite limited. The pumping of the Upper Castle Hayne at the Lee Creek Mine, in an effort to keep the pit dry, has created a cone of depression not only in the Upper Castle Hayne, but also in the overlying Yorktown and Pungo River formations and the underlying Lower Castle Hayne and Beaufort formations proving the existence of hydraulic connection between all these units. This cone of depression is asymetrical, the short axis westward and the long axis eastward. The water levels are not stabilized and a pseudo-steady state was reached after about 15 months of pumping. While in May 1966, the virtual radius of the cone was 28.0 miles, it has lowered the water level in the Upper Castle Hayne to some degree for up to 40 miles from the mine, resulting in a piezometric surface below sea level in an area of about 100 miles. (See the enclosed maps: Piezometric Surface of the Castle Hayne Aquifer in 1965 and Upper Castle Hayne Unit Piezometric Surface July, 1970.) At the periphery of the mine site, the piezometric surface is about 120 feet below mean sea level where, at the start of pumping, it was 7 feet above. Except for a small area in the upper end of the Pamlico estuary, ground water is moving toward Lee Creek from all directions with a resultant increased rate of flow from the west and reversed direction of movement in the east. Also re-



PIEZOMETRIC SURFACE OF THE CASTLE HAYNE AQUIFER IN 1965
(N.C. Department of Water and Air Resources)



UPPER CASTLE HAYNE UNIT PIEZOMETRIC SURFACE JULY, 1970
(N.C. Dept. of Water and Air Resources)

versed is the greater leakage upward, out of the Castle Hayne into overlying aquifers and estuaries, to the present day greater leakage downward. While leakage is usually helpful in improving the performance of wells, it may result in the contamination of the pumped aquifer by interception of surface and ground water having undesirable qualities. While formerly many of the farmers in the area enjoyed the convenience of flowing wells in pastures or pumping their wells with suction pumps, the impact of the cone has made necessary the conversion of 960 domestic and 45 irrigation wells to deep well units. There is wide disagreement among experts concerning the magnitude of recharge to the Castle Hayne aquifer with estimates of below 65 mgd to as much as 280 mgd. The arguments are mainly concerned with the areal extent of the recharge area, with estimates from below 170 square miles to as much as 500 square miles. Presently there is insufficient data and much disagreement involved in the issue of possible salt water intrusion and contamination of the fresh water supplies. That the valuable phosphate deposits overlying the Castle Hayne aquifer should be mined is an idea readily acceptable to all concerned. However, the idea that in the process of mining or other activities the quality of the aquifer system must be preserved is equally accepted as being very important. With the advent of additional mining companies in the area concern over the aquifer is heightened, and contradictory predictions as to their probable effect on the aquifer system have been made. Understandably, the protection of the future quality and source of their water

supply is also a major concern for the citizens of Aurora. Under the direction of the N.C. Board of Water Resources, studies are continuing to be conducted in an effort to better understand the make-up of the aquifer system and, thus, to be able to manage its use more effectively. (See enclosed map: Ground Water Recharge Areas.)

(2) Fragile areas (Refer to Fragile Areas Map for information on wetlands, prime wildlife habitats, estuarine waters, and public trust waters.)

(3) Areas with resource potential (Refer to Resource Potential Areas Map for information on productive and unique agricultural lands, potentially valuable mineral sites, outdoor recreation lands, and areas well-suited for woodland management.)

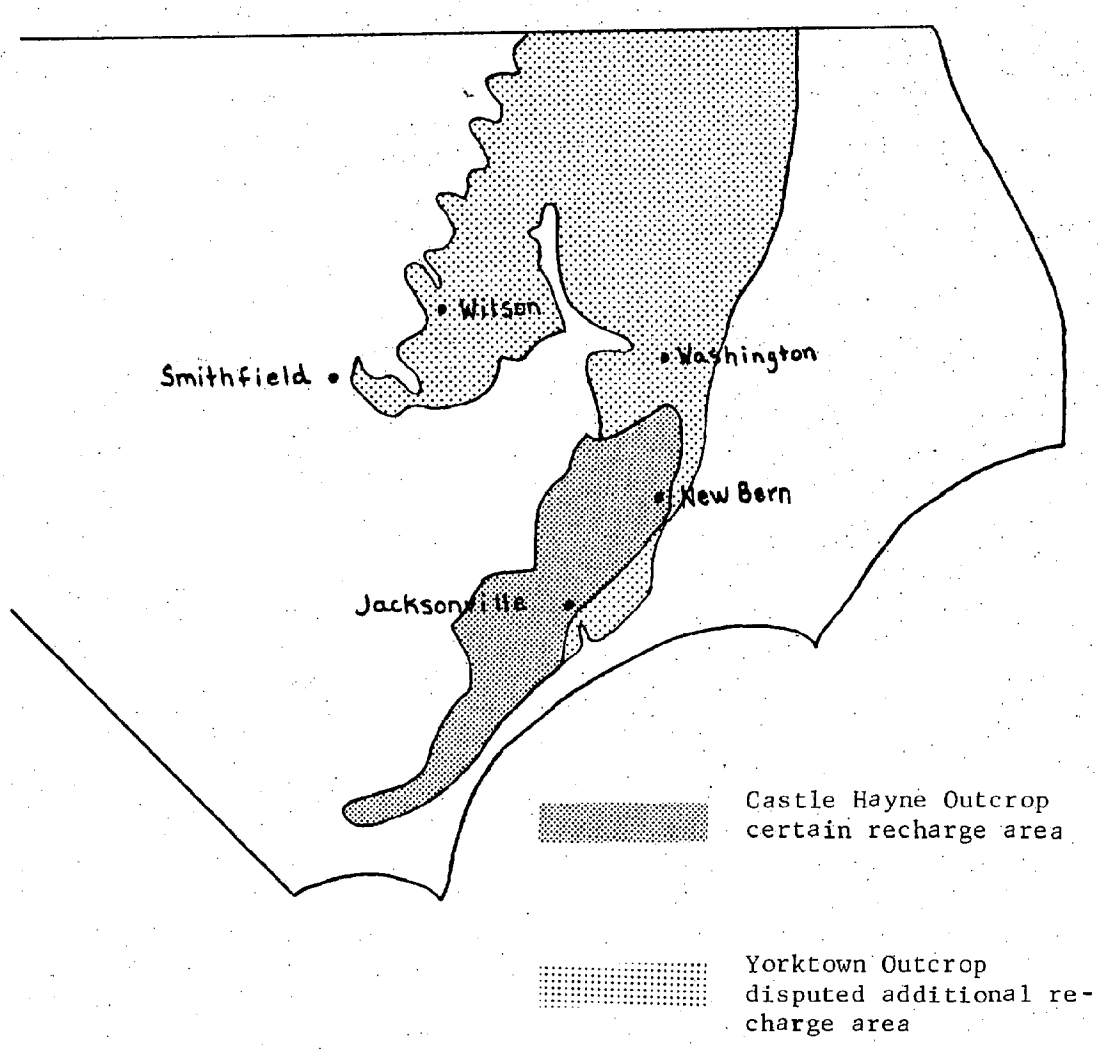
B. Capacity of Community Facilities

(1) Existing water and sewer service areas

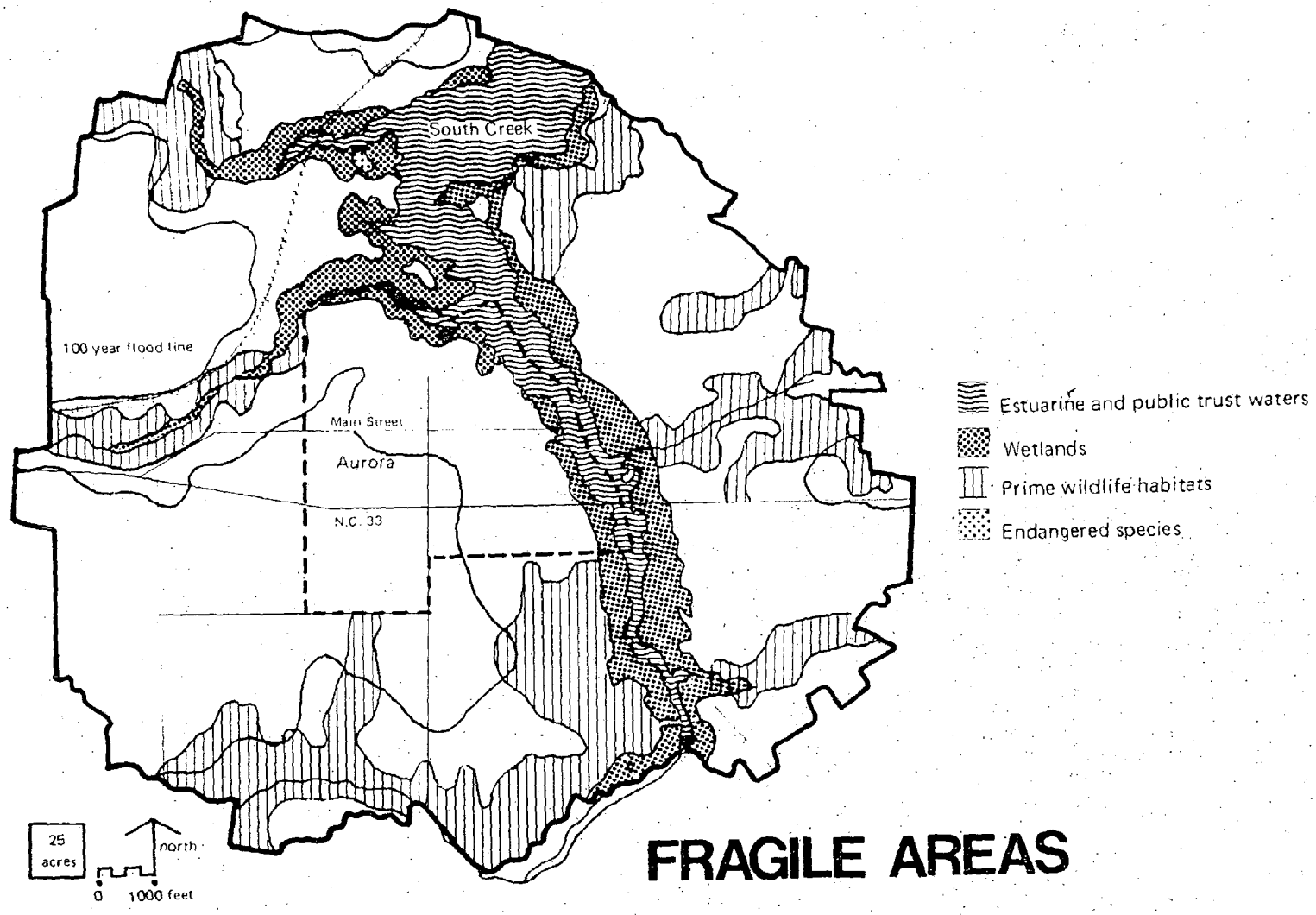
- Water--All residential streets within the Aurora town limits are serviced by water lines. Grace Drive and the southern portion of 7th Street are being served by P.V.C. lines as is the portion of Main Street that is east of 1st Street.
- Sewage--Most of the residential streets north of N.C. 33 are fairly well served by sewage lines. The exception is the extreme northern portion of the town. Residences along N.C. 33 and south of that highway use septic tanks.

(2) Design capacity of existing facilities

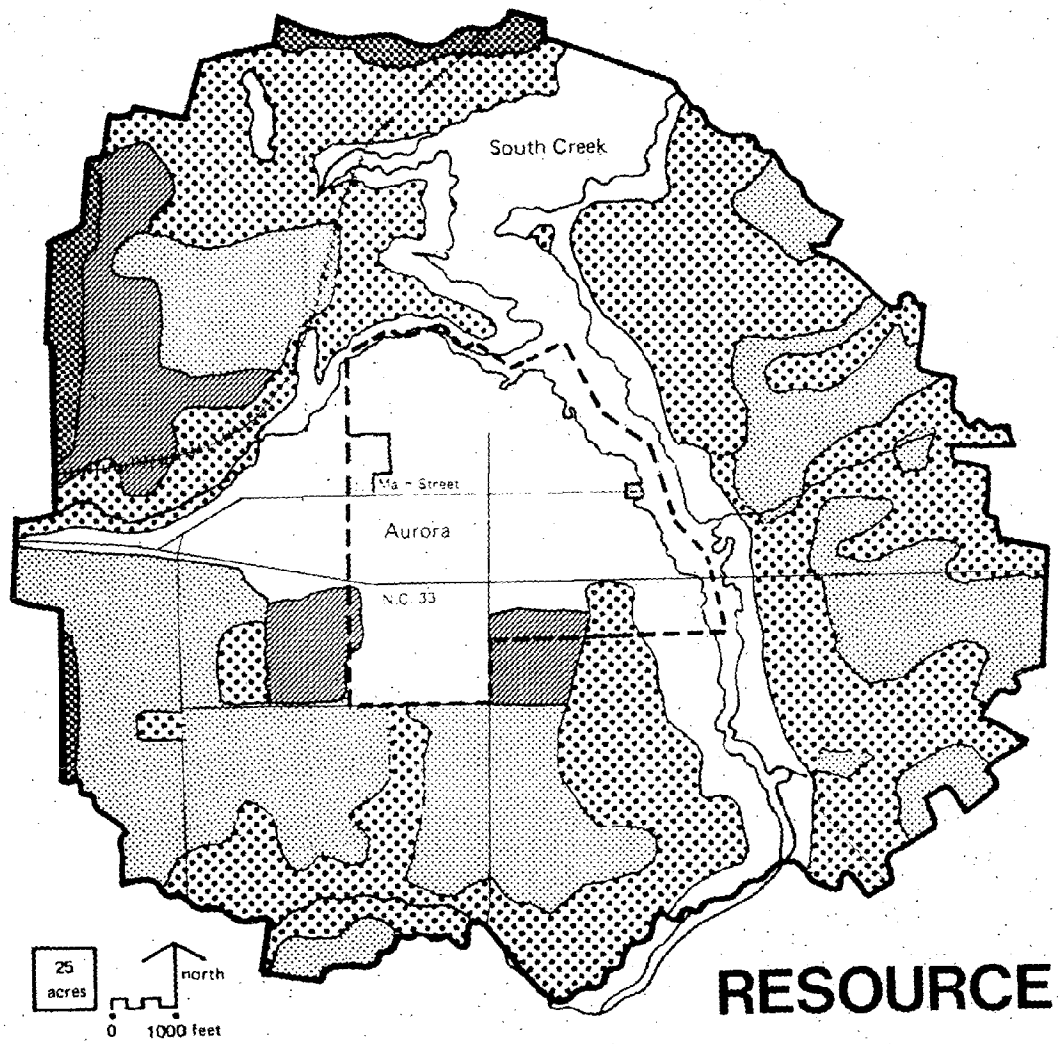
- Water treatment facility--Aurora has one deep well to a depth of 340 feet with an average flow of 500 gpm and a treatment capacity of .288 mgd. The peak load to date is .082 mgd. The



GROUND WATER RECHARGE AREAS



FRAGILE AREAS



Potentially valuable mineral sites
Unique agricultural land
Prime agricultural land
Areas well-suited for woodland management
Public outdoor recreational land

RESOURCE POTENTIAL AREAS

town has one water tower for storing 100 mg of treated water. The present system can serve 1200 people.

- waste water facility--Aurora has a 4-acre stabilization lagoon and a 1-acre polishing lagoon. The present capacity is .120 mgd and the average daily load to date is .050 mgd. The present system can serve 1200 people.
- schools--The Aurora High School is situated on a 10.4 acre site and contains grades eight through twelve. The current enrollment (May 1976) is 472 pupils. There are 18 small classrooms and an inadequate library. The school contains an auditorium, a lunchroom, a less-than-satisfactory gymnasium, and an out-of-date shop. An $800,000 addition to the high school is currently under construction. The Snowden Elementary School is located just outside the corporate limits on a 13.9-acre site. It houses grades kindergarten through seven. The current enrollment (May 1976) is 569 pupils. There are 25 small classrooms with an inadequate library, one gymnasium, one lunchroom, and a shop shared with the high school.
- roads--Highway 33 from the township line east to Aurora averages 1633 vehicle trips per 24 hours. From Aurora east to the county line it averages 570 vehicle trips per 24 hours. The design standard for two lane primary roads is 21,600 vehicle trips per 24 hours.

(3) Percent utilization of existing community facilities

- The water treatment facility is being utilized at 28% of capacity.
- The waste water facility is being utilized at 41.6% of capacity.
- The high school is being utilized at 89.3% of capacity.

- The elementary school is being utilized at 93% of capacity.
- North Carolina Highway 33 is being utilized at 7.5% of capacity at its point of greatest usage.

C. Estimated Demand

(1) Population and economic projections

- Historic population (1950-1970), estimated population (1973-1975) and population projections (1980-2000) for Aurora, North Carolina

  The population projections for the town of Aurora are based on an analysis of two base line projections: Population and Projections 1970-2000 by the North Carolina Department of Administration, Office of State Planning, 1974 and the OBE Base-Line Population Projections by the Research Triangle Institute. In addition, detailed analyses of town water and sewer hook-ups, government population estimates for revenue sharing, and other town data were made to supplement these projections. Local population changes due to the phosphate industry construction and mining were also taken into consideration.

  The figures that follow are a combination of the above data and represent a continuous rate of growth of 8.2% every five years between 1970-2000. This was the estimated rate from 1970-1975. If Aurora pursues the goals to attract second home development and/or new industries, the rate of growth could be greater; these additional populations are described under potential projected additional summer population and potential projected additional population due to new industry, but are not included in the base projections:

Year	Population	Estimated Population	Projected Population	Potential Projected Additional Summer Population	Potential Projected Additional Population Due to New Industry	Potential Projected Additional Population from one-mile Area
1950	525[1]					
1960	449[1]					
1970	620[2]					
1973		635[3]				
1974		685[4]				
1975		671[5]				
1980			726[6]	25[7]		
1985			786[6]	35[7]	50[8]	40[9]
1990			850[6]	43[7]	60[8]	
1995			920[6]	49[7]	65[8]	
2000			995[6]	53[7]	125[8]	
2025			1476[10]			

NOTES:

1. Source: U.S. Census Data
2. This 38.1% increase from 1960 to 1970 was due to two major factors: first, the annexation of South Village and second, the influx of people with jobs related to Texasgulf, Inc. Source: U.S. Census Data
3. Source: U.S. Department of the Treasury, Office of Revenue Sharing.
4. Source: State of North Carolina, estimate for Revenue Sharing.
5. Source: Town of Aurora, estimate from water hook-ups.
6. This represents a constant 8.2% increase for the five years. This rate is subject to major change depending upon construction of new phosphate mining facilities, the occupancy of public housing units and other events. In a town of this size, considering the magnitude of impact of the phosphate mining, major fluctuations can be expected.
7. National development experts predict a new wave of second home-resort development in the Coastal Plains Region inland from the coast, but this additional population is dependent upon the town pursuing the goal of developing the second home and tourist potential.
8. Although Aurora has selected industrial sites, a requirement it fulfilled prior to winning the Governor's Award in 1975, and has a goal of diversifying its industrial base, these figures are highly speculative.
9. Aurora will have to absorb most of this additional population.
10. This represents a constant 8.2% increase for 5-year increments. See note number six for additional constraints on this estimate.

- Economic development of any region is critically tied to patterns of land use including changes in these patterns over time. This area is now primarily forest and cropland and, in varying degrees, has historically been used as such. Industrial expansion and corresponding declines in agricultural land have had only a moderate impact in this area. Only 2.3% of Beaufort County is urban and developed, 26% is in cropland; 1.5% in pastures; 64.4% is in forests. Most of the development existing in the area is dependent to some extent upon natural resources of the region, in particular the agricultural fertility of the soil, the suitability of the area for woodlands, and increasingly, the availability of mineral resources. Industry has also been attracted to the area by the large supply of unskilled farm labor, relatively low wages, lack of unionization, available water transport, and nearness to major mid-Atlantic markets. In North Carolina the trend has been toward fewer acres devoted to farming, a corresponding decrease in the number of farms and an increase in the average size of farm units.

(2) Future land needs

- It is estimated that Aurora will grow from 671 to 871 for a net gain of 200 people in the 10 year planning period. Additionally, an estimate of 40 new people will be added to the one-mile extraterritorial planning area in the next 10 years. This gives a total estimate of 240 people to be allocated to the developed, transition, community and rural land classes. An estimate has been made that 50% of the projected population will be absorbed in the transition classified lands requiring 64 acres, 5% will be absorbed as in-fill in the community classified land, 45%

will be allocated to the developed land classification as in-fill, and 0% will be allowed in the rural classified land, (refer to Appendix I: Goals for Aurora, especially goal six, for the basis of these decisions).

(3) Community facilities demand

- Community services to adequately serve the projected population in the transition and in-fill developed areas include, as a minimum, roads, educational facilities and water and sewer services

SECTION III: EXISTING LAND USE MAP

(See enclosed Existing Land Use Map, page 6A)

SECTION IV: LAND CLASSIFICATION MAP

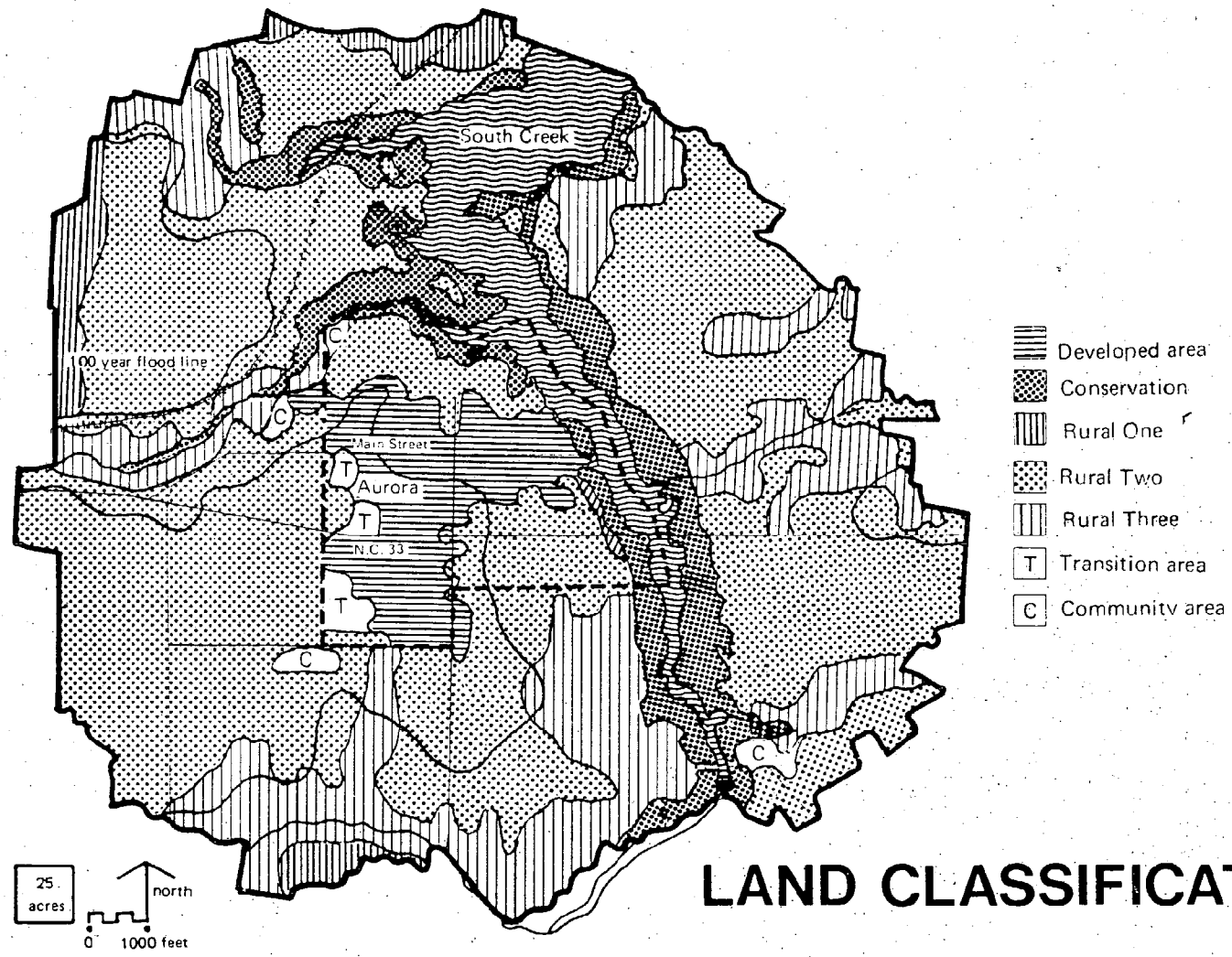
(See enclosed Land Classification Map)

SECTION V: MAP AND WRITTEN TEXT DESCRIBING AND INDICATING APPROPRIATE DEVELOPMENT FOR PROPOSED AREAS OF ENVIRONMENTAL CONCERN

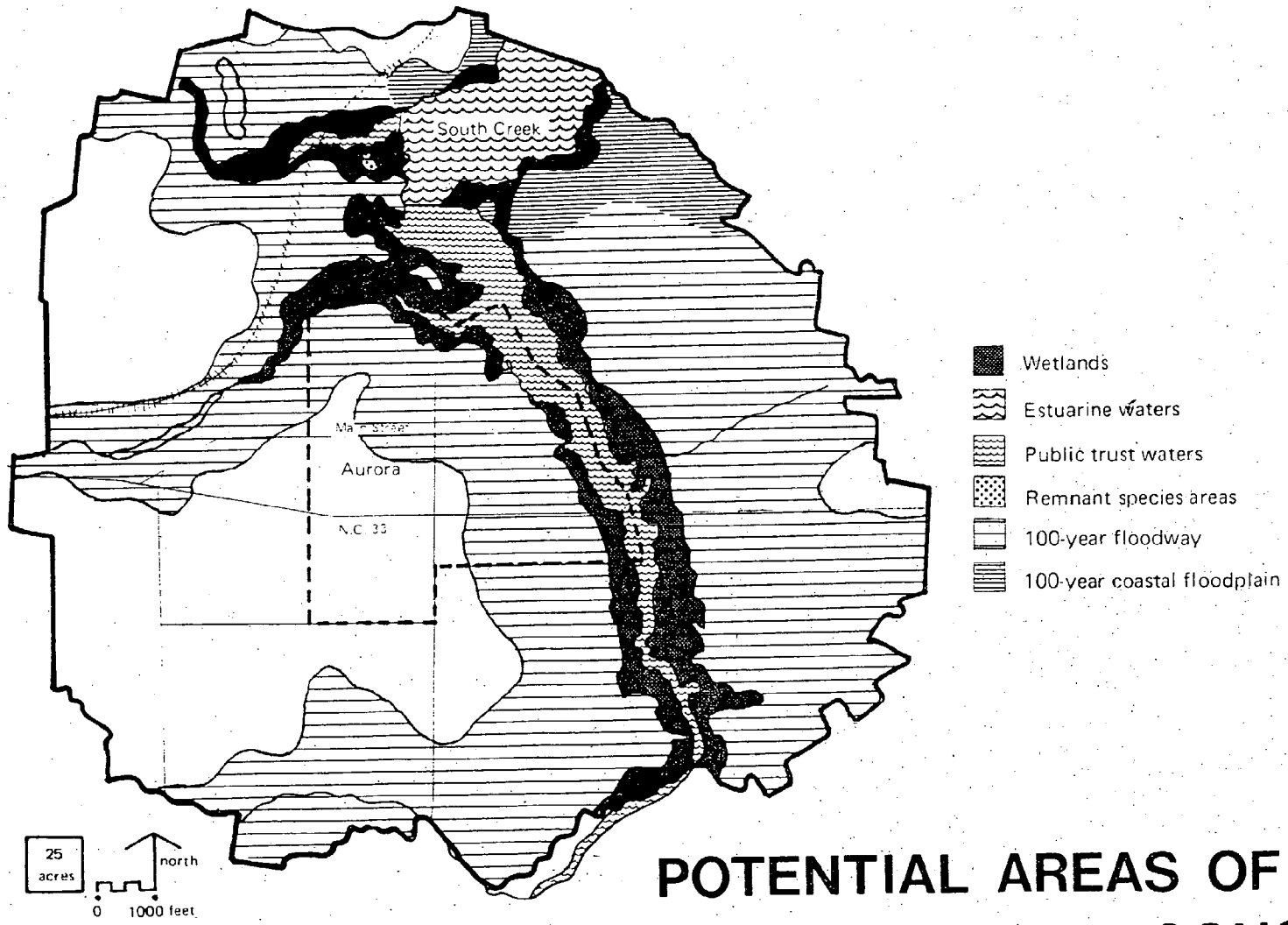
(See enclosed Potential Areas of Environmental Concern Map)

1. Coastal Wetlands--other coastal marshes

- These are defined as any salt marsh or other marsh subject to regular or occasional flooding by tides, including wind tides (whether or not the tide waters reach the marshland areas through natural or artificial water courses), provided this shall not include hurricane or tropical storm tides. Salt marshland or other marsh shall be those areas upon



LAND CLASSIFICATION



POTENTIAL AREAS OF ENVIRONMENTAL CONCERN

which grow some salt marsh and marsh plant species. Coastal wetlands described as other coastal marshland exist on both sides of South Creek and in large areas along Bailey Creek to the north of Aurora. They are composed mainly of black needlerush (Juncus roemerianus) and common cat-tail (Typha latifolia).

- Significance: This marshland type contributes to the detritus supply necessary to the highly productive estuarine system essential to North Carolina's economically valuable commercial sports fisheries. The composition of these types of marshes is different from tidal marshes and each apparently has different relationships with the surrounding waters. Variations in drainage, length of inundation, and salinity are thought to be the major features determining the distribution of plants and animals. This marshland type also serves as an important deterrent to shoreline erosion especially in those marshes containing heavily rooted species such as Juncus roemerianus. The marshland to the north of Aurora is especially important in absorbing water from storm tides and therefore acts as a buffer to the town.
- Appropriate land use: All marshlands in Aurora and the one-mile area surrounding Aurora, will be conserved in their present state. Sufficient sites already exist for water access without breaching marshlands. Locating such water-related facilities as boat ramps, piers, docks, and marinas in marshlands may be justified in the future only by changes in land use demands or community development objectives, but in no case shall the allocation exceed the capacity of the marshland system to sustain losses without harm to the estuarine eco-system.

2. Estuarine Waters

- These are defined as all the water of the Atlantic Ocean within the

boundary of North Carolina and all the waters of the bays, sounds, rivers, and tributaries thereto seaward of the dividing line between coastal fishing waters and inland fishing waters, as set forth in an agreement adopted by the Wildlife Resources Commission and the Department of Conservation and Development filed with the Secretary of State entitled "Boundary Lines, North Carolina Commercial Fishing Inland Fishing Waters, revised March 1, 1965," or as it may be subsequently revised by the Legislature.

- Significance: Estuaries are among the most productive natural environments of North Carolina. They not only support valuable commercial and sports fisheries, but are also utilized for commercial navigation, recreation, and aesthetic purposes. Species dependent upon estuaries such as menhaden, shrimp, flounder, oysters and crabs make up over 90 percent of the total value of North Carolina's commercial catch. These species must spend all or some part of their life cycle in the estuary. The high level of commercial and sports fisheries and the aesthetic appeal of Coastal North Carolina is dependent upon the protection and sustained quality of our estuarine areas. In addition, the estuarine waters located within the extraterritorial jurisdiction of Aurora provide one of the best wintering areas in the entire state for Canvasback Ducks and other water fowl species.
- Appropriate land use: Estuarine waters within the extraterritorial area of Aurora will be conserved. Bulkheading to prevent erosion and the building of piers or wharfs where no other feasible alternative exists may be allowed within estuarine waters provided that such land uses will not be detrimental to the biological and physical estuarine functions and public trust rights. Such proposed projects must include a statement

of impact on existing navigation channels, shoreline erosion potential, spoil deposition below mean high tide, changes in water circulation patterns, changes in water quality standards, and effects on shellfish waters. The development of additional navigation channels should be prohibited because of the existence of an adequate system.

3. Fragile, Historic or Natural Resource Areas, Areas that Sustain Remnant Species

- These are areas that sustain remnant species or those places that support native plants or animals, rare or endangered, within the coastal area. Such places provide habitat conditions necessary for the survival of existing populations or communities of rare or endangered species within the county. In the extraterritorial jurisdiction of Aurora, habitat conditions exist and sightings have been made of several endangered species. Two 3-4 foot alligators were sighted in a canal inside the town limits in the spring of 1975 and two osprey nests (one to the south of the town on South Creek and one to the north on Whitehurst Creek) have been identified by the local wildlife protector. In addition, this area provides habitat for Canvasback Ducks and the Red Cockaded Woodpecker, both of which have been sighted in this area.
- Significance: The continued survival of certain native plants and animals in the coastal area that are now rare or endangered cannot be assured unless the relatively few well-defined areas providing necessary habitat conditions are protected from development or land uses that might alter these conditions. These habitats and the species they support provide a valuable educational and scientific resource.
- Appropriate land uses: The absolute preservation of these areas in their natural state is extremely important in order to protect the habitat conditions responsible for the continued survival of the respective plants

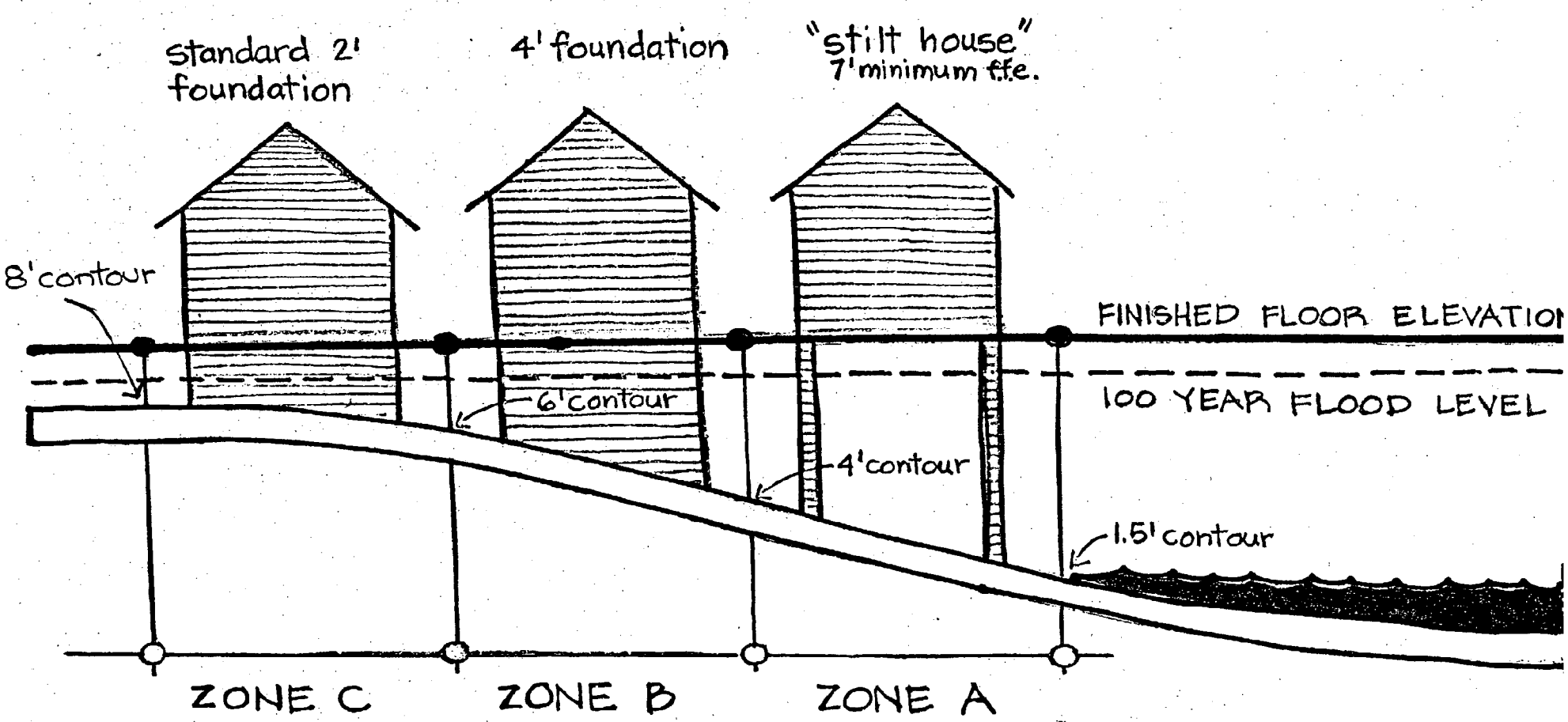
or animals. All habitats in this area are adjacent to or located in marshlands which lends even stronger support for conserving these areas. Therefore, all such areas that can be positively identified as areas supporting rare or endangered species will be preserved.

4. Public Trust Areas--Public Trust Waters

- These are defined as ocean and estuarine waters plus coastal streams, tributaries and lakes in which the public may have rights of navigation, access or other public trust rights.
- Significance: The public has rights in these waters including navigation and recreation. In addition, these waters support valuable commercial and sports fisheries and have aesthetic value. A large portion of the surface waters within the extraterritorial limits of Aurora provide public rights for navigation, recreation and sports fisheries.
- Appropriate land uses: Any land use which interferes with the public right of navigation, or other public trust rights which the public may be found to have in these waters, shall not be allowed. The building of piers, wharfs, marinas, or bulkheads to prevent erosion shall be allowed in appropriate locations provided that such uses will not be detrimental to the biological and physical functions and public trust rights. The development of navigation channels in these public trust waters are not essential because of those already existing and will therefore be prohibited. Other projects which would directly or indirectly block or impair existing navigation channels, increase shoreline erosion, deposit spoils below mean high tide, cause adverse water circulation patterns, violate water quality standards, or cause degradation of shellfish waters are generally considered incompatible with the management of public trust waters.

5. Natural Hazard Areas--Floodways

- These are defined as the channel and that portion of the floodplain of a stream determined to provide passage for the 100-year flood without increasing the elevation of that flood at any point by more than one foot.
- Significance: Floodways serve as the main channel for the passage of flood waters. Development within the floodway may increase the potential of flood damage and unreasonably endanger life and property.
- Appropriate land uses: A certain degree of development will be allowed if land uses conform to the guidelines set forth in Chapter X--Federal Insurance Administration, Subchapter B--National Flood Insurance Program, Part 1910--Criteria for Land Management and Use, 1910, 3d. First priority for land uses in a floodway will be given to those non-intensive recreational, rural, and conservation uses listed in G-S 143-215.54. In the case of the town of Aurora where two-thirds of the town lies in a floodplain, any land use meeting the Federal Insurance Administration guidelines will be allowed. Much development already exists in the floodplain and economic and efficient land use criteria can justify a continuation of this development trend. Therefore, the following zonation plan will be followed (see diagram--Requirements of Structures in Flood Prone Areas):



REQUIREMENTS OF STRUCTURES IN FLOOD PRONE AREAS

--Zone A--This is the land area from the mean high water level inland to the four foot contour. The finished floor elevation of all new construction in this zone will have to be elevated a minimum of seven (7) feet. At the present, no homes in Aurora are in violation of this restriction.

--Zone B--This is the land area from the four foot contour inland to the six foot contour. The finished floor elevation of all new construction in this zone will have to be elevated a minimum of four (4) feet.

--Zone C--This is the land area from the six foot contour inland to the boundary of the 100-year flood prone area. This boundary coincides approximately with the eight foot contour. The finished floor elevation of all new construction in this zone will have to be elevated a minimum of two (2) feet or else be flood-proofed in some acceptable manner.

6. Natural Hazard Areas--Coastal Floodplain

- These are defined as land areas adjacent to coastal sounds, estuaries or the ocean which are prone to flooding from storms with an annual probability of one percent or greater (100-year storm) as identified by the State Geologist.
- Significance: Coastal floodplains are those lands subject to flooding or wave action during severe storms or hurricanes. They are lands where uncontrolled, incompatible, or improperly designed buildings, structures, facilities, and other development can unreasonably endanger life and property.
- Appropriate land uses: Any land use that occurs must conform with the standards of the Federal Insurance Administration for coastal flood hazard areas and safety during the flood surge from a 100-year storm. (Code of Federal Regulations, Title 24, Chapter 10, Subchapter B).

However, no additional development should be allowed in the coastal floodplain within the extraterritorial area. There is no development trend in these areas, there are very few access points and the coastal floodplain borders estuarine waters which are excellent wintering areas for several species of ducks, including the Canvasback. Consequently, no economic justification for development in these areas presently exists.

Enforcement

- The town of Aurora has notified the Coastal Resources Commission of its intent to develop an enforcement program enabling the town to issue minor permits in the areas of environmental concern.

SECTION VI: CITY-COUNTY RELATIONSHIP DEFINED

Beaufort County recognizes and acknowledges Aurora's right to establish the one-mile extraterritorial area and its efforts to develop a land use plan to control development within the boundaries of that area. However, some problems regarding inconsistencies between the two plans have arisen.

The town of Aurora began its planning process to comply with the Coastal Area Management Act in September of 1974 and completed the substance of the plans in August of 1975. Throughout most of this time the Beaufort County planning process was from three to six months behind the Aurora process.

The inconsistencies which exist between the town's and the county's plan can be attributed, at least in part, to this time lag. However, another and perhaps more important reason is that Aurora's plan was developed to a greater detail than the county plan, especially with respect to the rural classes of land. Aurora's planners were able to obtain data which allowed for a more refined

approach to the identification and classification of rural land in the planning area. In addition, the town of Aurora believes there are significant questions concerning the validity of the county's goal of daming the Pamlico River. Among the most significant of these questions is whether the quality of benefits derived from the project would reflect the high cost involved. Also, there are serious questions regarding environmental damage and flood protection which must be answered before any project of this type is undertaken.

Regardless of these few conflicts, a spirit of cooperation does exist between Aurora's planners and the Beaufort County planner as well as between the town and the County Board of Commissioners. Hopefully, this cooperation will eventually lead to a resolution of the conflicts.

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APPENDICES

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